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THE APPLICATION OF THE MOLECULAR ROTATION TO THE DETERMINATION OF THE VALUE OF CINCHONA BARKS.

BY DR. E. J. DE VRIJ.

The strong deviation of the plane of polarization in different direction or different intensity by all the known cinchona alkaloids, induced me to try to apply this action to test the value of the cinchona barks; and, although I readily confess that my experiments in this direction are far from being complete, yet the results already obtained seem to me interesting enough to fix attention on this new method of investigation, so that their publication may, perhaps, afford some interest.

Before proceeding to the description of my method, it may, perhaps, not be superfluous to state the principles upon which it is based.

The molecular rotations of the cinchona alkaloids which are known with certainty are the following:—

Quinine:
 in alcoholic solution [α]j=184°·35 ↺ } De Vrij and
 in acid solution . . [α]j=287°·16 „ } Alluard.
Quinidine:
 in alcoholic solution [α]j=250°·75 ↻ Pasteur.
 in acid solution . . [α]j, not yet determined.
Cinchonine:
 in alcoholic solution [α]j, not yet determined.
 in acid solution . . [α]j=190°·40 ↻ Bouchardat.
Cinchonidine:
 in alcoholic solution [α]j=144°·61 ↺ Pasteur.
 in acid solution . . [α]j, not yet determined.

Besides these four alkaloids, about whose existence all chemists agree, and whose properties are well known, there exists in the cinchona barks still a fifth alkaloid, which is amorphous, soluble in ether, and whose compounds with acids are equally amorphous. I have long been uncertain if this alkaloid has an action on the plane of polarization, and it is only very recently that I became persuaded that it deviates from that plane slightly to the right. I have, however, not yet succeeded in determining the exact amount of this deviation, because this alkaloid is always yellow-coloured, and very difficult to obtain perfectly pure.

It is clear from the preceding that the different cinchona alkaloids possess a different rotation, and that some of them deviate the plan of polarization in an opposite direction. Therefore, in examining optically the combined alkaloids of any bark, three cases can occur:—

I. The alkaloids may prove inactive, viz. to exercise no deviation at all. This case, although not yet observed by me, may present itself, if the relative quantities of the alkaloids are such that their opposite deviations neutralize each other.

II. They are turned to the right (dextrogyre = ↻) if the quantity of quinidine, cinchonine or amorphous alkaloid exceeds that of quinine or cinchonidine.

III. They are turned to the left (lævogyre = ↺) if the quantity of quinine or cinchonidine exceeds that of the other alkaloids.

From the facts mentioned, it appears that the deviation produced by quinine is different, depending on its being observed in solution in alcohol or in a diluted acid. It is very probable that this difference exists in the same direction with the other alkaloids, and its determination will be very desirable.

Taking now in consideration that, of the five mentioned alkaloids, two of them, viz. the quinine and the amorphous alkaloid, are very soluble in ether, whilst the three remaining alkaloids are sparingly soluble in this liquid; it follows that, if the alkaloids are treated with ether, the deviation exercised by the part insoluble in ether will prove to be very different from that observed before. This different deviation may be the following:—

(1.) No deviation, if the part insoluble in ether contains enough of cinchonidine to neutralize the opposite deviation of the cinchonine.*

(2.) Deviation to the right (dextrogyre) if the part insoluble in ether consists of cinchonine or quinidine, or both of them, or if their quantity is superior to that of the eventually present cinchonidine. The intensity of the deviation may throw some light upon this alternative.

(3.) Deviation to the left (lævogyre), if the part insoluble in ether consists either totally or chiefly of cinchonidine. In this case the intensity of the deviation will equally throw light upon the alternative.

The great difficulty with these observations consists in the difficulty to obtain solutions of the alkaloids which are not too much coloured. The first

* As quinidine deviates to the right like cinchonine, it can equally neutralize the deviation to the left of the cinchonidine. It is, however, very rare that cinchonidine and quinidine occur in the same bark. Till now I have only found one example of this combined occurrence, viz. in the bark of the hybrid from *C. Calisaya* and *C. Pahudiana* (the so-called *C. Hasskarliana*, Miq.), in which bark I found the four alkaloids, together with the amorphous alkaloid soluble in ether.

requisite to measure accurately the deviations is that the solution is colourless, and till now I have not yet succeeded in obtaining this desideratum, but have been obliged to be satisfied by obtaining solutions which had a slightly yellow colour. I obtained these solutions as follows:—After ascertaining the total amount of alkaloids in a bark, the alkaloids were dissolved in weak acetic acid, and to this solution added a few drops of basic acetate of lead. After separating the lead by a current of sulphuretted hydrogen the liquid, much discoloured by the precipitated sulphide of lead, was filtered, and the alkaloids precipitated by caustic soda. The precipitate being washed and dried, one may proceed to prepare the solution for the optical observation. The alkaloids are accurately weighed, and the determined weight called p. This quantity is dissolved in diluted sulphuric acid, and the volume of the solution accurately measured.* This volume is called V, and filtered immediately into the tube, in which it will be observed. This tube has a length of 100 millimetres. After the tube has been completely filled and closed, and it has been ascertained that its contents are perfectly clear and transparent, it can be observed in the instrument.† If the different alkaloids are present in such quantities that their opposite deviations neutralize each other, the molecular rotation is $= 0°$, and this result needs only to be noted. If, however, a deviation is observed, this deviation is noted as $\alpha°$ = to the amount of degrees of deviation observed, either to the right or the left; for instance, $\alpha° = 3°$ ↷, or $\alpha° = 3°$ ↶, etc. One has now the necessary data to calculate the molecular rotation = $[\alpha]j$ of the mixed alkaloids by using the formula:—

$$[\alpha]j = \frac{\alpha° \, V}{p} \text{ ↶ or ↷‡}$$

After this determination another part of the alkaloids is treated with ether, and the deviation of the part insoluble in ether determined in the same way. By these two determinations one obtains two data, which, notwithstanding the still existing imperfections of the method, will prove to be of great utility in the investigation of cinchona barks, as may be seen by the following observations made by Dr. B. Simpson and myself.

A. Observations by Dr. B. Simpson.§

1. *C. Calisaya*, from Java.
   Stem-bark.

Total amount of alkaloids 1·36 per cent. $[\alpha]j = 160·5°$ ↷.
The alkaloids contained chiefly quinidine.

2. *C. Calisaya*, from Java.
   Bark from a branch.

Total amount of alkaloids 0·84 per cent. $[\alpha]j = 140°·6$ ↷.
The alkaloids contained a large amount of quinidine.

3. *C. Pahudiana*, from Java.
   Root-bark.

Total amount of alkaloids 1·5 per cent. $[\alpha]j = 26°·35$ ↶.

4. *C. succirubra*, from Darjeeling.
   Stem-bark of plants 3½ years old.

Total amount of alkaloids 5·6 per cent. $[\alpha]j = 13°·59$ ↶.
The alkaloids consisted of quinine, cinchonidine (both lævogyre), cinchonine and amorphous alkaloid (both dextrogyre).

5. *C. succirubra* from Ootacamund.
   Renewed bark (fourth harvest).

Total amount of alkaloids, 9 per cent. $[\alpha]j = 55°·5$ ↶.
The part insoluble in ether proved $[\alpha]j = 19°·8$ ↶.
The same alkaloids as in 4, but more cinchonidine and less cinchonine.

6. *C. officinalis* from Darjeeling.
   Stem-bark (one year covered by moss).

Total amount of alkaloids 7·68 per cent. $[\alpha]j = 56°·35$ ↶.
The part insoluble in ether proved $[\alpha]j = 13°·20$ ↶.
The same alkaloids as in 4 and 5, but much more quinine, of which the quantity amounted to 3·4 per cent.

7. *C. officinalis* from Ootacamund.
   Renewed bark (second harvest).

Total amount of alkaloids, 8 per cent. $[\alpha]j = 139°·49$ ↶.
The same alkaloids as in 6, but containing much more quinine; they were almost entirely soluble in ether.

B.—Observations by Myself.

1. *C. Calisaya* from Darjeeling.
   Bark of trees three years old.

Total amount of alkaloids, 3 per cent. $[\alpha]j = 120°·7$ ↷.
The part insoluble in ether proved $[\alpha]j = 174°·34$ ↷.
The alkaloids consisted of cinchonine, quinine, amorphous alkaloid and cinchonidine.

2. *C. hybrida* from Darjeeling, probably from *C. Calisaya* and *C. officinalis*.
   Bark of trees three years old.

Total amount of alkaloids, 3·24 per cent. $[\alpha]j = 178°$ ↶.
The alkaloids consisted of quinine, cinchonidine, amorphous alkaloid and very little cinchonine. The part insoluble in ether was too small for observation.

3. *C. succirubra* from Darjeeling.
   Stem-bark, sold in London in October, 1870.

Total amount of alkaloids 6 per cent. $[\alpha]j = 24°·1$ ↷.
The alkaloids consisted of cinchonidine, cinchonine, amorphous alkaloid and quinine.

4. *C. officinalis* from Ceylon.
   Bark sold in London in November, 1870.

Total amount of alkaloids 5·7 per cent. $[\alpha]j = 145°·8$ ↶.
The part insoluble in ether proved $[\alpha]j = 91°·96$ ↶.
The alkaloids consisted of quinine, cinchonidine, amorphous alkaloid and cinchonine. The quantity of pure quinine amounted to 3·7 per cent.

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* Weight and measure are of the metric system.

† The instrument used by me is the polaristrobometer, of Wild. It is, however, clear that any other good instrument may be used.

‡ Although the sulphide of lead has a very favourable action in taking away a great part of the colour of the solution, its action is not the same with all kinds of bark. I am therefore unable to state with certainty the quantity of alkaloids which ought to be dissolved in a certain volume. It is desirable to make a solution which contains 0·1 of the alkaloids. This is, however, in general not possible, because of the too intense colour, wherefore the quantity of the alkaloids in the solution varies between 0·1 and 0·05.

§ These observations have been made by Dr. B. Simpson, Surgeon, of the Bengal Army, in my laboratory at the Hague, in February 1870.

5. *C. Calisaya* from Java.
Bark sold in April, 1870, at Amsterdam, under the name of—
"Java koningskina, No. 1."
Total amount of alkaloids, 3·21 per cent. $[\alpha]j = 96^\circ\cdot3$ ↶.
The alkaloids consisted of amorphous alkaloid, quinidine, cinchonine and a trace of quinine.

6. *C. Calisaya hybrida* from Java (*C. Hasskarliana*, Miq.).
Bark sold in April, 1870, at Amsterdam, under the name of—
"Java koningskina, Nos. 2 and 3."
Total amount of alkaloids 3·125 per cent. $[\alpha]j = 50^\circ\cdot2$ ↷.
The alkaloids consisted of quinine, quinidine, cinchonine, cinchonidine and amorphous alkaloid.

7. *C. Calisaya* from Java.
Bark sold in April, 1870, at Amsterdam, under the name of—
"Java koningskina, No. 4."
Total amount of alkaloids 2·47 per cent. $[\alpha]j = 20^\circ$ ↶.

8. *C. Pahudiana.*
Bark sold in April, 1870, at Amsterdam under the name of—
"Bruine Javakina." *
Total amount of alkaloids 1 per cent. $[\alpha]j = 138^\circ$ ↷.
The alkaloids consisted of quinine, cinchonidine and amorphous alkaloid, whilst the presence of cinchonine was dubious.

9. *C. Calisaya* from Bolivia.
Eastern Bolivian bark.
Total amount of alkaloids 4 per cent. $[\alpha]j = 138^\circ$ ↷.

Notwithstanding the defects still adhering to the method, I feel certain that it will prove to be an important element in the examination and classification of the Cinchona barks.

The Hague, 20th April, 1871.

PEPSIN.

BY G. A. ZWICK.

So much has been said and written about this remedy, that the subject would seem nearly exhausted. I desire, therefore, only to communicate the result of a few experiments just completed; these, with the investigations of others, may perhaps lead to the adoption of a formula for a preparation of this article in the next edition of the U. S. Pharmacopœia.

1st. A fresh stomach of a pig was emptied and the slimy mucous substance scraped off, spread upon a glass plate and dried.

2nd. The mucous membrane (scraped off as above) was dissected from the body of the stomach, cut up into moderately fine pieces. This weighed 8 oz.; it was digested with ℥viij pure glycerine (acidulated with ʒij muriatic acid) for twelve hours, expressed, and more glycerine added till ℥viij were again obtained. This fluid was set aside and separated after a few days; the clear was poured off and filtered, warming it a little to facilitate filtration.

3rd. Another pig's stomach was cleanly washed and wiped, macerated with water (acidulated with hydrochloric acid) for twelve hours, this water poured off and more added, washing and rubbing the membrane well. All these washings and the first infusion of twelve hours, making 24 ounces, were filtered, precipitated with acetate of lead, and treated with sulphuretted hydrogen, being the process mentioned in the U. S. Dispensatory, but the liquid pepsin was evaporated to ℥viij only, not to dryness.

To compare these preparations they were tried with coagulated albumen.

No. 1. Six-tenths ($\frac{6}{10}$) of a grain of the dry mucus dissolved 12 grains albumen.

No. 2. One fluid drachm of the glycerine preparation dissolved 12 grains of albumen.

No. 3. Five fluid drachms (ʒv) of the watery solution dissolved 12 grains of albumen.

The above result, however, does not represent the utmost solving power, excepting of No. 1. Nos. 2 and 3 suffered losses of pepsin. No. 2 lost pepsin on account of being digested and warmed while still in contact with the mucous membrane, and I am sure considerable pepsin was lost, as the mass became quite soft and pulpy. The process should be carried on cold. No. 3 lost some of the precipitate during washing. This process is not practicable in warm weather, as the liquors decompose rapidly.

Summing up my experience, I should take No. 2 as the process furnishing the most permanent preparation, being agreeable both to the eye and the palate of the patient. It has a bright, clear straw-colour, an agreeable bland taste and could be made double the above strength. It is not subject to the changes and other objections of the powders, is ready when it passes out of the hands of the apothecary, without further mixing, and not objectionable in taste to the most fastidious.—*Amer. Journ. of Pharmacy.*

SYRUPUS CALCIS LACTO-PHOSPHATIS.

BY WILLIAM NEERGAARD.

In the *Archives Générales de Médecine* for December, 1869, and for January and February, 1870, Dr. L. Dusart recommends the use of a new preparation, which he terms the lacto-phosphate of lime, in which the lime salt is dissolved in free lactic acid.

Dr. B. W. M'Cready, of Philadelphia, requested me to prepare a syrup containing that compound, and I adopted the following formula:—

Concentrated Lactic Acid, fl℥j
Magma of freshly Precipitated Phosphate of Lime, q. s.
Aquæ Fl. Aurant., fl℥iss
Aquæ Puræ, q. s. ad fl℥viij
Sacchari Albi, ℥xj.

Mix the lactic acid with 2 fluid ounces of water and saturate it with the magma. Put the liquid upon a filter and add the rest of the water until 8 fluid ounces of filtrate are obtained. Pour this upon the sugar, contained in a bottle; shake occasionally until solution is effected and strain. No heat ought to be applied, else the syrup assumes a milky appearance.

The syrup thus prepared contains between 2 and 3 grains of dry phosphate of lime in each fl℥, besides the lactic acid.—*Amer. Journ. of Pharmacy.*

* The barks mentioned under 5, 6, 7 and 8 are the first products from the Cinchona plantations in Java brought into the market for sale.

CHINESE BLISTERING-FLIES.

BY F. PORTER SMITH, M.B. LOND., M.R.A.S.

The entomology of China is not peculiarly rich, when we bear in mind its semi-tropical character as a climate. The extreme, or considerable, cold of the country proves fatal to the crowds of insects which infest the house and the field, but of which a mere salvage is saved to renew the sorts. In no country, however, is so much wealth gathered from the labours of insects as in China. The *Coccus lacca*, which produces the gum-lac; the *Coccus pehlah*, which secretes the spermaceti-like wax of Chinese pharmacy; the *Coccus manniparus*, which prepares honey-sugar; the silkworm; the diplolepis gall produced upon the oak-tree; and the nut-galls (*Wu-pei-tsze*) produced upon the *Rhus semialata* and *Rhus succedanea*, are instances, amongst others, of that ingenious turning to account of things which is a strong habit of the utilitarian Chinese.

Insects, a large class, called in Chinese classifications, *Ch'ung*, and including frogs, mollusks, etc., are consumed by the Chinese as internal remedies.

Centipedes, scorpions, pediculi, and many other larval or imaginal forms of insects, are swallowed in wine as antidotal, derivative, and revulsive remedies. An anomalous creature, called the *Hia-ts'au-tung-ch'ung* ("in summer a plant, in winter an insect"), is a capital sample of a Chinese pet medicine. It is the *Hepialus* moth, with the *Cordyceps Sinensis* (fungus) growing parasitically upon it.

Blistering-flies are largely used in China. They are employed as diuretics, and to produce criminal abortion, so that their sale to ordinary persons is scarcely legal, and their use for such a purpose heavily punished by the Manchu Code of China. The *Mylabris cichorii* (*Pan-mau*) the Telini fly of India, is largely used in the country, as in the composition of an eye-powder (*Yé-ming-sha*), commonly believed to be the dung of the bat. This insect is an excellent substitute for the *Cantharis* of European pharmacy. The *Cantharis erythrocephala*, a common European species, is met with in North China, but the *Cantharis vesicatoria* has not been met with.

Species of so-called *Epicauta* are met with in China, and are apparently called *Tsáu-mau*, or Zizyphus bug, from their resemblance to the fruit of that genus of so-called "dates." The genus *Epicauta*, known by their running more to legs and horns, is now generally put with *Lytta* and *Cantharis*.

Another kind of blistering-fly, new to European pharmacy, is the *Chú-kí*, or Ailanthus bug. It is called, literally, the "fowl of the *Ailanthus fœtida*," from the noise which it makes in common with other cicadaceous insects of the class *Homoptera*. It is also called *Hung-liang-tsze*, or "red lady-bug," a curious coincidence with the name of a common English insect, the ladybird. Several species or varieties of this insect are described or alluded to in the *Pun-ts'au-kang-muh*, or Chinese Pharmacopœia. The genus called *Huechys*, from the Chinese name for blood, is met with in Java, as well as in North and South China and other places. The head, thorax and legs are black; the prothorax is red; the eyes are very prominent; a large red bright spot on each side of the thorax above; the front pair of wings are dark-brown, appearing nearly black when closed on the back of the insect; the hind pair of wings are pale with brown veins; and the belly of the creature is of a bright vermilion-red colour. Mr. Frederick Smith, of the British Museum, informs me that Burmeister places this insect, which I have called the red cicada on page 237 of my work on Chinese materia medica, in the order *Cicadina*, family *Stridulantia*. This same gentleman also informs me that Olivier (Encycl. Méthod. v. 756) calls it the *Cicada sanguinolenta*, whilst Amyot and Serville describe it as the *Huechys sanguinea*. This latter name is redundant, as both the genus and species mean bloody. It would be better to call the Chinese species *Huechys vesicatoria*. One Chinese variety is called the "ash-coloured moth." The *chú-kí* is met with in Sechúen, Shansi, Honan and Hupeh, and frequents the *Ailanthus*, *Broussonetia (Morus) papyrifera* and several other trees. They are met with in great quantities in autumn, when they make a grinding noise, and are collected by the country people, who sell them, fresh, to the druggists at a few pence per pound. They are capable of raising a blister, but are much less powerful than the *Mylabris cichorii*, with which they are combined in the treatment of hydrophobia. The legs and wings are removed, and the bodies only used for medicinal purposes. They are recommended in the *Pun-ts'au*, as a remedy in barrenness, impotency, menstrual disorders, deficient lochia, lumbago, diseases of the eye, etc. The drug is curiously directed to be used as a vaginal suppository in female disorders. It is combined with olibanum, arsenic, sal ammoniac and rice-paste, as an application to struma of the neck. Their use in hydrophobia, along with the *Mylabris*, to produce strangury, is in accordance with Chinese theory that the bite of mad dog impregnates the person, who is not safe until the delivery of a fœtal dog by way of the urinary passages. Hydrophobia is with them the climax of the period of gestation, and they promote parturition by giving the *Huechys* and the *Mylabris* internally; or, rather, they endeavour to induce abortion, as the drug is administered in wine at once in such quantities as to cause violent strangury. Along with the blood and other substances passed by the patient they profess to find a little dog. The Chinese doctors reason well enough that dog-bitten people die, and may be fairly treated after any extreme fashion. From this it may be gathered that the people die after the remedy even more promptly than after the bite alone. The drug can, therefore, be scarcely recommended for trial in such cases. It is creditable that few remedies are highly vaunted in Chinese medical works for a malady which is not common in China, where dogs are as plentiful and plaguy as in Constantinople. These blistering cicadas keep very badly, and, therefore, often disappoint the purchaser in China, where drugs are badly treated, like the patients.—*Medical Times and Gazette.*

DUST AND SMOKE.*

After a few preliminary experiments illustrative of the polarization of light, Professor Tyndall adverted to the polarization of light by fine dust, by the sky, and by the coarser particles of smoke. In the former the direction of maximum polarization, as in the case of the sky, is at right angles to the illuminating beam. In the latter, according to the observations of Govi, the maximum quantity of polarized light was discharged obliquely to the beam. Govi's observation of a neutral point in such beam, on one side of which the polarization was positive and on the other side negative, was also referred to. The additional fact was then adduced that the position of the neutral point varied with the density of the smoke. Beginning, for example, with an atmosphere thickened by the dense fumes of incense, resin, or gunpowder, and observing the neutral point, its direction was first observed to be inclined to the beam *towards* the source of illumination. Opening the windows so as to allow the smoke to escape gradually, the neutral point moved down the beam, passed the end of a normal drawn to the beam from the eye, and gradually moved forward several feet down the beam. The speaker did not halt at these observations, they were introduced as the starting-point of inquiries of a different nature, and after their introduction the discourse proceeded thus:—

But what, you may ask, is the practical good of these curiosities? And if you so ask, my object is in some

* Lecture delivered at the Royal Institution, Friday evening, June 9, 1871.

sense gained, for I intended to provoke this question. I confess that if we exclude the interest attached to the observation of new facts, and the enhancement of that interest through the knowledge that by-and-by the facts will become the exponent of laws, these curiosities are in themselves worth nothing. They will not enable us to add to our stock of food or drink or clothes or jewellery. But though thus shorn of all usefulness in themselves, they may, by leading the mind into places which it would not otherwise have entered, become the antecedents of practical consequences. In looking, for example, at this illuminated dust, we may ask ourselves what it is. How does it act, not upon a beam of light, but upon our own lungs and stomachs? The question at once assumes a practical character. We find on examination that this dust is organic matter—in part living, in part dead. There are among it particles of ground straw, torn rags, smoke, the pollen of flowers, the spores of fungi, and the germs of other things. But what have they to do with the animal economy? Let me give you an illustration to which my attention has been lately drawn by Mr. George Henry Lewes, who writes to me thus:—

"I wish to direct your attention to the experiments of Von Recklingshausen should you happen not to know them. They are striking confirmations of what you say of dust and disease. Last spring, when I was at his laboratory in Würzburg, I examined with him blood that had been three weeks, a month, and five weeks out of the body, preserved in little porcelain cups under glass shades. This blood was living and growing. Not only were the Amœba-like movements of the white corpuscles present, but there were abundant evidences of the growth and development of the corpuscles. I also saw a frog's heart still pulsating which had been removed from the body (I forget how many days, but certainly more than a week). There were other examples of the same persistent vitality or absence of putrefaction. Von Recklingshausen did not attribute this to the absence of germs—germs were not mentioned by him; but when I asked him how he represented the thing to himself, he said the whole mystery of his operation consisted in keeping the blood *free from dirt*. The instruments employed were raised to a red heat just before use, the thread was silver thread and was similarly treated, and the porcelain cups, though not kept free from air, were kept free from currents. He said he often had failures, and these he attributed to particles of dust having escaped his precautions."

Professor Lister, who has founded upon the removal or destruction of this "dirt" great and numerous improvements in surgery, tells us of the effect of its introduction into the blood of wounds. He informs us what would happen with the extracted blood should the dust get at it. The blood would putrefy and become fetid, and when you examine more closely what putrefaction means, you find the putrefying substance swarming with organic life, the germs of which have been derived from the air.

Another note which I received a day or two ago has a bearing particularly significant at the present time upon this question of dust and dirt, and the wisdom of avoiding them. The note is from Mr. Ellis, of Sloane Street, to whom I own a debt of gratitude for advice given to me when sorely wounded in the Alps. "I do not know," writes Mr. Ellis, "whether you happened to see the letters, of which I enclose you a reprint, when they appeared in the *Times*. But I want to tell you this in reference to my method of vaccination as here described, because it has, as I think, a relation to the subject of the intake of organic particles from without into the body. Vaccination in the common way is done by scraping off the epidermis, and thrusting into the punctures made by the lancet the vaccine virus. By the method I use (and have used for more than twenty years) the epidermis is lifted by the effusion of serum from below, a result of the irritant cantharidine applied to the skin. The little bleb thus formed is pricked, a drop of fluid let out, and then a fine vaccine point is put into this spot, and after a minute of delay it is withdrawn. The epidermis falls back on the skin and quite excludes the air—and not the air only, but what the air contains.

"Now mark the result—out of hundreds of cases of revaccination which I have performed, I have never had a single case of bloodpoisoning or of abscess. By the ordinary way the occurrence of secondary abscess is by no means uncommon, and that of pyæmia is occasionally observed. I attribute the comparative safety of my method entirely, first, to the exclusion of the air and what it contains; and, secondly, to the greater size of the apertures for the inlet of mischief made by the lancet."

I bring these facts forward that they may be sifted and challenged if they be not correct. If they are correct, it is needless to dwell upon their importance, nor is it necessary to say that if Mr. Ellis had resigned himself wholly to the guidance of the germ theory, he could not have acted more in accordance with the requirements of that theory than he has actually done. It is what the air contains that does the mischief in vaccination. Mr. Ellis's results fall in with the general theory of putrefaction propounded by Schwann, and developed in this country with such striking success by Professor Lister. They point, if true, to a cause distinct from bad lymph for the failures and occasional mischief incidental to vaccination; and if followed up they may be the means of leaving the irrational opposition to vaccination no ground to stand upon, by removing even the isolated cases of injury on which the opponents of the practice rely.

We are now assuredly in the midst of practical matters. With your permission I will recur once more to a question which has recently occupied a good deal of public attention. You know that as regards the lowest forms of life, the world is divided, and has for a long time been divided, into two parties, the one affirming that you have only to submit absolutely dead matter to certain physical conditions to evolve from it living things; the others, without wishing to set bounds to the power of matter, affirming that in our day no life has ever been found to arise independently of pre-existing life. Many of you are aware that I belong to the party which claims life as a derivative of life. The question has two factors: the evidence, and the mind that judges of the evidence; and you will not forget that it may be purely a mental set or bias on my part that causes me throughout this discussion from beginning to end, to see on the one side dubious facts and defective logic, and on the other side firm reasoning and a knowledge of what rigid experimental inquiry demands. But judged of practically, what, again, has the question of Spontaneous Generation to do with us? Let us see. There are numerous diseases of men and animals that are demonstrably the products of parasitic life, and such disease may take the most terrible epidemic forms, as in the case of the silkworms of France in our day. Now it is in the highest degree important to know whether the parasites in question are spontaneously developed, or are wafted from without to those afflicted with the disease. The means of prevention, if not of cure, would be widely different in the two cases.

But this is by no means all. Besides these universally admitted cases, there is the broad theory now broached and daily growing in strength and clearness—daily indeed, gaining more and more of assent from the most successful workers and profound thinkers of the medical profession itself—the theory, namely, that contagious disease generally is of this parasitic character. If I had heard or read anything since to cause me to regret having introduced this theory to your notice more than a year ago, I should here frankly express that regret. I would renounce in your presence whatever leaning towards the germ theory my words might then have betrayed.

(*To be continued.*)

THE ÆSTHETICS OF LABELS.

BY JAMES R. MERCEIN.

"A good workman is known by his chips," says the old adage; a careful pharmacist is known, or should be, by his labels, say I. Sent out as they are upon multiform parcels to the homes of our customers, they pass beyond our reach and speak for themselves—and for us. It behoves us, then, to be very circumspect as to the outward adorning of our dumb representatives. A roughly cut, badly printed label, such as we too often see, is like a "shocking bad hat," on a well-dressed man, spoiling the *tout ensemble* and betraying the sloven. Pharmacists err in thinking their patrons inobservant of such seemingly small matters. The almost Egyptian mystery that surrounds the ordinary details of our profession baffles the looker-on, and he naturally judges us by our outward symbols and tokens, of which the label is the most familiar. *Ex pede Hercule*,—if by the brazen foot the ancients estimated the statue, let us see to it, that the labels, our representatives, shall be a worthy exemplar of our work. The form of the label is the first point to be looked at. A round peg in a square hole does not look more out of place than an ill-shaped or over-sized label, and yet every day you will see a huge bit of paper on a "wee little" bottle, or a diminutive scrap on a portly flagon, thereby neutralizing the good looks of both labels and vials. Of course there can be no definite rule as to proper sizes, but the pharmacist should train his eye and his taste intuitively to recognize the right proportions. Let him avoid exactly square labels, or those abortive attempts which resemble monumental tablets. Double lines in the border, and rounded tops will give a label, printed in black ink especially, a tomb-stone look that must be suggestive to the patient. Hogarth insisted that the curve was the line of beauty, but if he had seen the shield-shaped labels now in such common use for "Elixirs" and "Syrups," he would have retracted his assertion instanter. Tastes will differ, of course, but to my eye these pharmaceutic escutcheons are fearfully and wonderfully ugly. In fact, almost every irregular form of label, unless its matter is nicely distributed and its type selected with the greatest care, is apt to be very ungraceful. For steady use, the old-fashioned oblong label, in width not quite half its length, wears best and looks best. For packages, the strip label, long and narrow is preferable. Well printed and tied on, so that its upper edge lies on the edge of the fold, it sets off a handsome bundle.

An octagon looks well on pill-boxes, and is a relief from the almost inevitable circle.

But it is in the printed matter, its distribution and its types where improvement is sadly needed. Why pharmacists in the progressive age should persist in using the stereotyped phrases in vogue thirty years ago, the same old-fashioned type, the venerable mortar, alembic, and retort; why we should do these things because our fathers did so before us, is a mystery. The art of type-cutting presents us with so many varied forms of letters, that numberless combinations, novel yet elegant, can readily be made. The chief error with pharmacists is a tendency to over-crowd their labels with reading matter; one would think they were trying to advertise all their wares in this small space, and yet the truth is, beyond the publicity of name and address, the label is not an advertisement, but merely a voucher for the contents of the package. A few lines, terse and to the point, are far better than a crowded jumble of disjointed sentences. "A rivulet of text flowing through a meadow of margin" should be the rule, as every printer will tell you. Useless verbiage and common-place phrases should be avoided. "Fine drugs and chemicals constantly on hand," "physicians' prescriptions carefully compounded," etc. etc., should be treated with the respect due to old age—and laid aside. If we are good pharmacists, these antique puffs will be unnecessary; if we are poor ones, such stale bait will not lure customers.

The titles that pharmacists assume are, as a general thing, decidedly inappropriate, and needing amendment. There is no doubt that the words "Pharmaceutist," or "pharmacist," are more nearly correct as expressing our professional status, although some contend that these should be peculiar to graduates. Be this as it may, the nomenclature of to-day is wrong. "Druggist" means no more or less than a seller of drugs, crude or otherwise, and implies no skill. It puts us on a level with any tradesman who simply sells to gain; the word should be confined to wholesale dealers only. Even when yoked with "chemist," as it often is, it will not pass muster. How many of us can lay the slightest claim to being chemists, further than the ordinary requirements of every-day business will warrant the title; and yet we coolly force ourselves into the ranks of a profession that requires the life-long attention of a Liebig, a Berzelius, a Doremus, or a Bridges! "Dispensing chemist" is equally absurd, or even more so. Who for a moment, aided by the most vivid imagination, could picture the above-mentioned analysts dispensing senna and manna, or mixing a dose of oil! The term "apothecary" is so exclusively English, and refers to such a different mode of doing business, half medical and half pharmaceutical, that it is totally inapplicable here. "Pharmacist" expresses exactly what we are; is not so clumsy as "pharmaceutist," looks well on a label, and better than all, does not make us appear, like the jackdaw of the fable, in borrowed plumes. In closing this homily, it seems almost superfluous to hint at such inelegancies as pasting one label over another, or over the seam of a bottle; of putting it on crooked, or with ragged edges; but I feel that most of my pill-rolling brethren will bear me out in the assertion that these slips are too often made. "What is worth doing at all, is worth doing well," says another old adage.—*American Journal of Pharmacy.*

FLUID EXTRACTS AND THEIR MENSTRUA.*

BY EDWARD R. SQUIBB, M.D.

In continuation of the subject of Percolation and Economy of Alcohol, annually presented to the Association for some years past, the writer offers an abstract of the results of his last year's experience, premising that he has neither the time nor inclination—as time becomes more valuable—to defend his notions, judgment, or accuracy, or even to point out many of the deductions that might be drawn from the statements made as facts.

It is not uncommon to hear observant physicians say that they do not obtain results from the fluid extracts corresponding in the proportion of minim for grain to the drug which they represent; and pharmacists who use the officinal formulas must be aware that the drugs are not entirely exhausted by the processes given. A critical inquiry into this subject, in this direction, is the chief object of this paper.

A practical way to measure the rate and extent of exhaustion by percolation has long been needed, and the want of some simple and easy plan has, perhaps more than any other obstacle, stood in the way of accurate knowledge and progress in the art of percolation. After many trials, some of which were described in previous papers, the method by specific gravity has thus far proved the most satisfactory and successful. But when applied by the hydrometer, or by the ordinary specific-gravity bottle, with the necessary calculations, it is too abstruse and complicated for common usage.

It is to a more plain and simple application of the principle of specific gravity that attention is now to be directed, and the formula may be stated as follows:—In

*** Read before the American Pharmaceutical Association at the meeting at Baltimore, 1871.**

percolation the density of the percolate will vary from the density of the menstruum in proportion to the extent and rate of the exhaustion. It follows from this proposition that to measure the extent and rate of exhaustion, it is only necessary to measure the extent and rate at which the percolate varies from the menstruum at the beginning of a percolation and approaches to it at the end, absolute exhaustion being indicated by equal density—or equal weight of the same volume at the same temperature—of the menstruum and percolate. This measuring is usefully accomplished with sufficient accuracy by separating the percolate as it passes into successive portions of a pint each and weighing them. By subtracting from this the weight of a pint of the menstruum at the same temperature, a series of differences will be obtained expressing the extent and rate of exhaustion. When the exhaustion is practically completed, —it is never absolutely accomplished,—the residue is dried and weighed, and its weight subtracted from the weight of the substance as originally taken for percolation. The difference or loss in weight indicates the total amount of solid matter dissolved and removed by the menstruum. Then, as the sum of the differences in weight between equal volumes of the menstruum and percolate at the same temperature, is to the total amount of solid matter or extract dissolved out by the menstruum, so is each separate difference to the weight of solid extract in the portion of percolate which that difference represents. That is to say, the total weight or amount of solid extract being ascertained, the ratio of the differences in density is applied to it to obtain a ratio of the rate of exhaustion, and to ascertain the distribution of the total extract throughout the percolate.

This method, applied to nearly all the fluid extracts which are at present officinal, and to some others, has convinced the writer,

First. That the present officinal processes do not sufficiently exhaust the drugs to which they are applied; and,

Second. That these processes do not take the best way to attain the object. That the supposed advantage of using coarse powders is a delusion. That maceration is useless at the commencement of the process of percolation, but useful after the substance has been partially exhausted. That the menstrua are not always the best that could be selected, either for extracting the useful portions of the drug or for excluding the useless portions. That glycerine is preferable to sugar where either gives any positive advantage, but that anything like a general use of glycerine in fluid extracts is to be deprecated, as the advantages are more in appearance than reality.

(*To be continued.*)

Iron Alum as a Hæmostatic.—A correspondent of the *Lancet* recommends the use of a strong solution of iron alum in glycerine as admirably adapted for the arrest of profuse bleeding where no large vessel is to be seen and secured. For hæmorrhage from the gums it may be applied in powder on a piece of lint; bleeding from the nose may be checked by stuffing the nostrils with lint saturated in the solution.

The Effect of Climate and Soil on Plants.—As an example of the effect of a tropical climate and soil on British cultivated plants and their products, may be mentioned the fact of the introduction of some peppermint plants from the Mitcham fields into a plantation at Singapore. After being planted in their new tropical home in a situation fully exposed to the sun they grew very well, but not to the height they grow in this country; moreover, they refused to flower, and almost as soon as they had arrived at full growth they dried up, having an appearance of being burnt. They were also found to yield not more than half the usual quantity of essential oil, and that of a dark claret colour and of an inferior odour.—*Gardeners' Chronicle.*

THE PHARMACY BILL.

SHEFFIELD PHARMACEUTICAL AND CHEMICAL ASSOCIATION.

A Meeting of the Council was held on Monday the 19th inst., for the purpose of considering the proposed Pharmacy Bill of 1871. There was a full attendance of members; Mr. Dobb, the President, in the chair.

The minutes of the previous meeting having been read and confirmed, the President introduced the subject which the Council had been called to discuss, by reading the Bill which had passed through the House of Lords, and stood for second reading, June 26th. In a few brief remarks he said he thought it was desirable that some action should be taken by this Council, and he would wish to take its sense of the desirability or otherwise of petitioning the House of Commons against the Bill.

Resolved—That this Council offer the most strenuous opposition to the proposed Bill, that a petition be drawn up for presentation to the House of Commons by George Hadfield, Esq., the senior member for the borough, and that Messrs. Wilson and Preston be delegated to represent the views of the chemists and druggists of this town and neighbourhood at the conference to be held in London.

Resolved—That the following letter accompany the petition and be also forwarded to the county and borough members individually:—

"Sir,—A petition, of which the enclosed is a copy, has been forwarded to the senior member for the borough of Sheffield for presentation to the House of Commons; the petitioners therefore respectfully solicit your opposition to any such partial enactment. The petitioners object that this 'Amended Pharmacy Act' should be construed as one with the 'Pharmacy Act, 1868,' the 16th clause of which reserves the right of apothecaries, veterinary surgeons, etc., who are thereby exempt from conforming to the regulations for the dispensing, selling and keeping of poisons. The Petitioners submit that any legislative action upon this subject should be strictly impartial, believing that persons registered under the 'Pharmacy Act, 1868,' as chemists and druggists are as duly qualified to dispense, sell and keep poisons as apothecaries, veterinary surgeons and medical students in the various public hospitals and dispensaries of Great Britain."

A second meeting of the Council was held on Tuesday evening, the 27th inst., at the rooms of the Association, at which it was reported that the petition, bearing the signature of seventy-two chemists and druggists of this town, had been duly presented.

The following (condensed) report was presented by the deputation:—

On Monday, June 26th, the deputation were honoured by an audience with George Hadfield, Esq., senior member for the borough of Sheffield. Your deputation urged upon the hon. member the several objections the great body of chemists had to the Bill already passed by the House of Lords, and read for the first time in the House of Commons. After a general conversation the hon. member promised his assistance. Your deputation also waited upon A. J. Mundella, Esq., junior member for the borough, on the same day, and repeated the objections to the Bill, and also to the principles contained therein, who said he would aid to the best of his power. On Tuesday, June 27th, your deputation waited upon H. J. Beaumont, Esq., member for the West Riding of Yorkshire, who also expressed much sympathy with the objects of the deputation. Your deputation were unable to obtain any interview with Viscount Milton, the other member for the West Riding, being out of town through severe illness. Your deputation also sought an interview with S. Plimsoll, Esq., member for Derby; but failing to meet with him, a letter was dispatched to his address. Your deputation, in conclusion, desire to record the kind and affable manner in which they were received by one and all the members of Parliament with whom it was their pleasure to come in contact. Your deputation feel that the course adopted by the Council has met with great success and encouragement.

Mr. Dobb proposed that the best thanks of this Council be given to Messrs. Wilson and Preston for the very energetic and admirable manner in which they had carried out the views of the Council. This was seconded by Mr. Radley, supported by Mr. Cocking and Mr. Ward, and carried unanimously. This concluded the business of the meeting.

BOLTON DISTRICT ASSOCIATION OF CHEMISTS AND DRUGGISTS.

A Meeting of the committee of this Association was held on Tuesday, June 20th, to consider the desirability of taking steps to oppose the passage through the House of Commons of the Pharmacy Bill, 1871, when it was unanimously decided that the petition received from the Manchester Defence Association, and which had been signed by almost every member of the trade in the district, should be forwarded to our senior Member for presentation, together with the following resolution:—

"That the petition, signed by almost every chemist and druggist in Bolton, Farnworth, Atherton and Tyldesley, be forwarded to John Hick, Esq., M.P., as senior Member for this borough, for presentation in the House of Commons, and that Lieut.-Colonel Grey, M.P., be supplied with a copy, and earnestly requested to support it.

The committee also beg to submit that the feeling of the whole trade in this district is most decidedly against the imposition of such an uncalled-for interference with the rights and liberties of persons conducting the business; and when it is considered that statistics prove the gross average of deaths through either misadventure or carelessness to be only 1½ persons per annum for the whole population of the kingdom, there is surely no sufficient reason for such vexatious proceedings. This feeling is most forcibly expressed in the following extract from a resolution forwarded for presentation to the Pharmaceutical Council in April last:—

"That the poisons regulations proposed by the Pharmaceutical Council are at the present time quite unnecessary, inasmuch as that by the recent Act of Parliament a very rigid examination for all future chemists and druggists is rendered compulsory, and it is considered that with such an educational status the safety of the public is most effectually provided for; and that, as the said regulations cannot be carried out without inspection, it is felt to be a most unjust and inquisitorial interference with the liberties of a body of tradesmen recognized as almost approaching the medical profession, who are not to be affected by such proposed legislation."

BRADFORD CHEMISTS' ASSOCIATION.

On Wednesday, the 21st ult., a Special General Meeting of all members of the trade was convened to be held in the room of the Society in Salem Street, to consider the "Amended Pharmacy Act." The response to this invitation was only small. The opinion of most of the leading members appeared to be that neither the Bill nor the Regulations which it sought to enforce could be hailed as a blessing conferred upon the trade, and, therefore, could not receive their support; yet it was thought that the fierce opposition and denunciation of some of its opponents was greatly in excess of what it merited, and that a more temperate and conciliatory attitude towards the Government would bring about a more satisfactory result. The following resolutions passed unanimously:—

1st. That this meeting having heard read a Bill entitled "An Act to Amend the Pharmacy Act of 1868," introduced into the House of Lords, and passed through all its stages in about a week, and having considered the same, expressed its strong disapproval of the Bill, and the unseemly haste with which it is being pushed through Parliament.

Proposed by Mr. Cockshott, seconded by Mr. Swaine—
2nd. That a petition to the House of Commons against the passing of the Bill be signed and forwarded for presentation to one of the borough members.

Proposed by Mr. Beanland, seconded by Mr. Pullen—
3rd. That the best thanks of the meeting be given to the President, Mr. Rimmington, for his services in the chair.

BIRMINGHAM.

At a Meeting of the Midland Counties Chemists' Association, held at the Temperance Hall, Birmingham, on June 27th, the following resolution was *unanimously* agreed to:—

Moved by Mr. George Dymond, seconded by Mr. C. J. Arblaster:—

"That the following form of petition to Parliament in reference to the Pharmacy Act now before Parliament, be adopted by this Council, and it is ordered that it be signed by the President and Secretaries and forwarded to Mr. Dixon for presentation."
Carried unanimously.

To the Honourable the Commons of Great Britain and Ireland in Parliament assembled.

The humble petition of the Midland Counties Chemists' Association, as represented by a meeting of the Council of that Association, held in Birmingham, on June 27th, 1871:—

Showeth:

"That, whereas a Bill, entitled 'An Act to Amend the Pharmacy Act, 1868,' is before the House of Commons, which contains provisions for imposing upon chemists and druggists in Great Britain compulsory regulations for the keeping and selling of poisons; and, whereas this subject has already obtained the serious attention of the Council of the Pharmaceutical Society, of the Pharmaceutical Society at large and of its Annual Meeting held last month in London; and, whereas these bodies have, after due deliberation, agreed upon the adoption of certain 'Recommendations' to be observed by chemists in keeping and selling poisons; and as the subject has been by the said Annual Meeting of the Pharmaceutical Society, remitted to the continued attention of its Council during the present year; and whereas, moreover, any legislative compulsory interference on this subject, which applies only to chemists, whilst it exempts the larger body of medical practitioners from its operation, would be partial, ineffective and unjust.

"Your petitioners, therefore, humbly pray that your honourable House will, for the present, suspend any further action in reference to the said Act, until the measures which the Pharmaceutical Society have adopted to attain the end in view, and which they still have under their care, have had a fair and reasonable trial, or until (if legislation be at last necessary) a more just and equal measure is prepared which shall embrace the whole of the dispensers of medicine in the kingdom.

"And your petitioners will ever pray.

"Signed by George Dymond,
"*President of the Association.*
"Joseph Lucas, }
"W. R. Jones, } *Secretaries.*"

A similar petition to Parliament from chemists and druggists was adopted, and is already extensively signed by the chemists of Birmingham and the district.

The Pharmaceutical Journal.

SATURDAY, JULY 1, 1871.

Communications for this Journal, and books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

PHARMACEUTICAL HOLIDAYS.

AMIDST the turmoil of the poison regulation question, it will, doubtless, be pleasant to many a hard-worked pharmacist to look forward to the time when the British Pharmaceutical Conference affords an opportunity for shaking off some of the dust of the shop and meeting together in friendly discussion. It is almost superfluous to remind our readers that the Conference meeting will this year be held in Edinburgh. The place of meeting is the Craigie Hall, St. Andrew's Square, where the President, Mr. W. W. STODDART, F.C.S., F.G.S., will deliver an address, on Tuesday, August 1st, at 10 A.M., prior to the reading and discussion of papers on pharmaceutical subjects during the rest of that day and Wednesday.

The Craigie Hall will be open as a reception room for members, from 9 A.M. to 6 P.M., on Monday, July 31st; Tuesday, August 1st; Wednesday, August 2nd and Thursday, August 3rd.

In addition to the attractions of Edinburgh, due to its situation and as the chief town of North Britain, the objects of interest in the city are numerous. Among these are the Castle, containing the ancient Regalia of Scotland, and commanding from its ramparts a most extensive view; the Chapel and Palace of Holyrood, rich in historical associations; Arthur's Seat, 822 feet high, and the Calton Hill, crowned by the National Monument. The Royal Observatory and Nelson's Pillar afford a prospect of the Frith of Forth and Ochil Mountains, which is not surpassed by any other locality in the world.

In the neighbourhood:—Roslin Castle, Hawthornden and the rare old chapel well merit a visit. Abbotsford, the seat of the late Sir Walter Scott, can be reached by rail in an hour and a half. The Queen's Drive, surrounding Arthur's Seat and Salisbury Craigs, Dalkeith Palace and grounds, new Battle Abbey, Dalhousie Castle, Hopetoun House, Dalmeny Park, and many other places of great interest and beauty, are within easy driving distance. Objects of interest to the geologist, botanist and student of natural history, will be found in abundance. Daily excursions may be had by railway to some of the finest Highland scenery.

The local members propose to give a Conversazione to their visitors, on the evening of Tuesday, 1st of August. It will take place in the Museum of Science and Art, at eight o'clock. A ticket of invitation has been forwarded to each member of the Conference, admitting himself and a lady. The Local Secretary begs that acceptances of the invitation be sent as early as possible.

Edinburgh and its neighbourhood have peculiar attractions for visitors, whether scientific or not. The city itself, especially from its situation, is well worthy of a visit. The whole district, for thirty miles round, is of high interest from the historic and antiquarian point of view; and there is an admirable field for the geologist and for students of natural history generally. As regards the meetings the public buildings in Edinburgh, and especially the University Class Rooms, afford ample accommodation, and from their proximity to each other they are eminently convenient.

It is considered probable that this meeting will be very numerously attended, owing to the facilities now afforded by the several railway and steamboat companies to parties travelling from all parts of Great Britain and the Continent.

The Railway Companies, in terms of an arrangement amongst themselves, will convey members of the British Association from any part of Great Britain to and from Edinburgh with first or second class return tickets, such tickets being available from *Tuesday, the* 1*st day of August*, until and including *Friday, the* 11*th day of August*, being the day after the meeting is concluded. Visitors to the Conference, however, are included in this extension of the usual limits of return tickets, since they would require to reach Edinburgh on Monday, July 31st. For those who may have time for a longer stay *tourists' tickets* to the North and West Highlands, are available for return within one month, with permission to break the journey at Melrose, Edinburgh, Perth, Dunkeld, Blair-Athole, Aberdeen, Inverness, and any other station where the train or steamer stops, either in going or returning.

LEMON AND LIME JUICE.

WE insert in another column a letter from Mr. ROBERT PALMER, relative to the adoption of citrate of potash as "a substitute for the horrible mixture of lemon-juice and rum with which our sailors are now drenched by Act of Parliament." We recur to this subject because it has already given rise to some leading remarks, and because we believe it to be the duty of the chemist to aid the physician in determining the exact value of prophylactic, as well as curative agents.

But we think that Mr. PALMER protests, and attempts to prove, too much. Lemon-juice and rum do *not* make by any means a "horrible mixture," nor do sailors particularly object to be "drenched" with it. According to the evidence of Budd, Parkes, Bryson and others, citric acid *has* antiscorbutic virtues, but inferior to those of lime and lemon-juice. It appears, indeed, that Mr. Palmer's communication includes things new and true, but some things that are true and not new, as well as some that are new and not true.

We have, however, to acknowledge his efforts as far as citrate of potash is concerned, and propose in a future number to lay before our readers the precise kind and amount of evidence (up to the present date) that exists as to the antiscorbutic value of lime and lemon-juice, as well as of all substitutes that have hitherto been proposed, and received a fair practical trial. Chemists then can judge whether the experience of the past will avail them in settling what is still a vexed question—the exact anti-scorbutic principle of lime and lemon-juice. Then, but not till then, shall we be in a position to recommend a substitute.

DR. RICHARDSON ON THE PHARMACOPŒIA.

In an address delivered before the St. Andrew's Medical Graduates' Association by Dr. B. W. Richardson, and recently published, occur the following remarks upon the Pharmacopœia, which may be of interest to our readers:—

"We had for a long time a book of common forms; a Latin book, in Rose, Shamrock, and Thistle editions, full of strange tales,

'Of herbs, plants, flowers, and their true qualities,'

writ in Latin. At last the strongest man in the practical reform of our craft in our time—the Cromwell of physic—condemned the book and its mysteries, and now it floats, in simple English dress, preparing to make its bow and retire altogether. Before I name the book, I must in parenthesis, say who this strong man was. It was the man who, opening the locked doors of hospitals, nailed them open, and who left behind him a work which—though its blasts and its hurricanes are subdued, though its noble Saxon tongue, ringing like the hammer of Thor on an anvil of silver, hath caught the Norman lisp, and though the hand of the poet, born, not made, moves in it no more—is, notwithstanding, under the momentum of his genius, still one of the most powerful class-journals in the worlds. The man I mean was the late Mr. Wakley.

"As for the book which he condemned, and which flourishes in this day as the 'British Pharmacopœia,' though the reform in it is not stout winning, it is a good giving-up of dead weight, and amidst an ocean of discouragement, is a faint but hopeful sign of advancement. It is beyond what it seems. It is leading us to ask whether simplification cannot be carried out further, and whether investigation as to remedies cannot be rendered more precise; it affords scope for the introduction of principles in therapeutics, and, binding us by a more correct nomenclature with advanced chemistry, it connects us closely with one section, at least, of the more accurate sciences."

We are requested, by the Special Committee directing the operations of the Society in reference to the Pharmacy Bill, to state that in addition to the petitions reported as having been presented to the House of Commons, other petitions have been sent up from Barnsley, Newark, Norwich, Weston-super-Mare, Ipswich, Stoke-on-Trent, West Hartlepool, Hereford, Ealing, Flint, Colchester, Basingstoke, Chesterfield, Tamworth, King's Lynn, Denbigh, Truro, Elgin, Windsor, Dorchester, Newbery, Ripon, Worcester, Great Yarmouth, Watford, Belfast, Cirencester, Montrose, Barnet, Berwick-on-Tweed, Chatham and Kent, Darlington, Stamford, Kingston-upon-Hull, Newcastle-under-Lyme, Bridlington, Wrexham, Rugby, Oxford, Folkestone, Leith, Bridport, Horsham, St. Alban's, Whitby, South Shields, Dover, Greenock, Knaresborough, Maidenhead, Wallingford, Thirsk, Bewdley, Selby.

We are informed that out of about two thousand chemists and druggists in the towns named, about eighteen hundred have signed the petitions.

The following *résumé* of the French regulations as to the sale of poisons may, at the present time, be of some interest to our readers:—Extract of decree of October 29, 1846, concerning the sale of poisonous substances. Poisonous substances for use in medicine can only be sold by pharmaciens, and from the prescription of a physician, surgeon, officer of health or licensed veterinary. This prescription ought to be signed, dated, and to detail fully the dose of the said substances, as well as the method of administration of the medicine. The pharmaciens shall copy the said prescriptions in a special register, endorsed and signed by the mayor or commissary of police. These copies ought to be made one after another and without any blank. The pharmaciens shall not return the prescriptions unless stamped with their seal; and after having thereon indicated the day when the substances have been delivered and the number of the copy in the register. The said register shall be preserved at least twenty years, and ought to be produced at every requisition of the authorities. Before delivering the medicinal preparation, the pharmacien shall put on it a label, showing his name and residence, and the internal or external use of the medicine. Arsenic and its compounds cannot be sold, except for medicinal purposes, unless combined with other substances. The quantities delivered, as also the name and residence of the buyers, shall be entered in the special register. The sale and use of arsenic and its compounds are forbidden for dressing wheat, embalming bodies and the destruction of insects. Poisonous substances ought to be always kept by merchants, manufacturers and pharmaciens in a secure place and locked up. The following poisonous substances, according to decree of July 8th, 1850, ought to be always kept in a secure place and locked up:—

Hydrocyanic Acid.
Belladonna Extract and Tincture.
Cantharides, Powder and Extract.
Chloroform.
Hemlock, Extract and Tincture.
Cyanide of Mercury.
Cyanide of Potassium.
Corrosive Sublimate.
Foxglove, Extract and Tincture.
Tartar Emetic.
Henbane, Extract and Tincture.
Tobacco.
Nitrate of Mercury.
Opium and Extract.
Phosphorus.
Ergot.
Thornapple, Extract and Tincture.

THE Bill passed during the last session of the New York Legislature* is severely criticized by the *American Journal of Pharmacy*. That journal states that, as the power of appointing the examiners is vested in the mayor, probably it will not be long before the board consists of politicians rather than of men who have the welfare of pharmacy at heart. There is no provision made for apprentices to learn under the guidance and supervision of others how to make up prescriptions; on the other hand, the salaries to be paid to the members of the examining board are so high that, after the licensing of the pharmacists at present engaged in New York, it is estimated that, if the new applications amount to one hundred annually, the licensing of every so-called drug clerk will cost the city one hundred and fifty dollars. The law is also condemned as ignoring the existence of pharmaceutical educational institutions, and as not being likely to give greater security to the public. It is suggested that if one-third of the money were expended on the New York College of Pharmacy, the facilities for pharmaceutical education would be increased; or if, in lieu of such a grant, the examination and licensing of applicants were entrusted to the College, the duty would be better and more satisfactorily performed.

THE State Medical Association of Mississippi, at their annual meeting held in April last, adopted a resolution inviting the "druggists, pharmaceutists and chemists" of the state of Mississippi to organize a State Pharmaceutical Association, to meet annually at the same time and place that the Medical Association does, and co-operate with it in all measures of mutual interest and importance.

THE Practical and Analytical Laboratory connected with the Philadelphia College of Pharmacy has been again placed by the Board of Trustees under the charge of Professor J. M. MAISCH. With a view of bringing this important feature of pharmaceutical education within the reach of all students, the fee for the coming winter session has been considerably reduced.

* See *ante*, p. 587.

Transactions of the Pharmaceutical Society.

ADJOURNED SPECIAL COUNCIL MEETING.

June 24th, 1871.

MR. A. F. HASELDEN, PRESIDENT, IN THE CHAIR.

Present—Messrs. Bottle, Betty, Brown, Greenish, Hills, Reynolds, Sandford and Williams. Mr. Flux, the Society's Solicitor, was in attendance.

The "Special Committee" appointed to direct the operations of the Society in communicating with the Local Secretaries and members upon the subject of opposing the Bill submitted their Report, and the circulars and forms of petitions which had been sent out under their instructions.

The following Memorial to the Right Hon. W. E. Forster, prepared by this Committee, was ordered to be sent:—

"*To the Right Honourable* W. E. FORSTER, M.P., *Vice-President of the Council.*

"*24th June*, 1871.

"Sir,—The Council of the Pharmaceutical Society beg most respectfully to submit to you some of the reasons which, they trust, will appear sufficient to induce you to withdraw the Pharmacy Bill, at least during the present Session of Parliament.

"1. The almost unanimous protest of the body of about ten thousand chemists affected by the Bill, whose claim to a hearing is certainly great, since the State owes to their voluntary exertions the gradual evolution of an organized system of pharmacy in Great Britain.

"2. The unfairness of the Bill towards the whole body of chemists, in subjecting them to penalties for such merely technical breaches of the regulations for storing poisons as would be constantly inevitable, whilst the still larger body of medical practitioners has a special exemption from the Act secured to it. We would submit that the danger connected with powerful medicines is either, firstly, inherent to the poison, or, secondly, it belongs to the person dealing with it. If the first presumption be accepted, the State should demand from all citizens the same compliance with regulations: to the second supposition we must emphatically object that there are no grounds for fixing this stigma either upon the Society we represent, or upon the general body of chemists and druggists. The unequal action of this Bill is strikingly shown in the case of Glasgow, where there are about sixty chemists and one hundred and twenty open surgeries kept by medical practitioners, and undistinguishable from the shops of the chemists in their appearance and in the business carried on. The deputation from Glasgow which waited upon the Council of the Pharmaceutical Society has most forcibly shown that the Bill would drive from the shops of the chemists to those of the surgeons all that numerous class of poorer customers requiring remedies that this Bill says may only be supplied by the chemist in a 'poison bottle.' A customer is in the habit of frequenting that shop in which all his wants are supplied. The hardship pointed out as affecting Glasgow would also affect, in a greater or less degree, London and many other places.

"3. The Act of 1868 contains a penal clause (Section 26) which gives to the Privy Council the power of removing from the register, and consequently ruining, any chemist who 'is convicted of any offence against this Act.' The adoption of the regulations would render liable to this penalty every chemist in the daily exercise of his calling. We are certain that it was not the intention of Parliament in 1868 that such penalties should be extended so as to cover hundreds of the circumstances which daily surround the chemist.

"4. The essential condition of such regulations as those now demanded is, that their limits be clearly defined. Now the Poison Schedule of the Act of 1868 has no fixed boundary. It comprehends by the frequent use of the term "*and its preparations*" between one and two hundred drugs; and with regard to the less potent of these preparations great diversity of interpretation and practice exists. Were the words taken literally, there is the absurdity of branding as poisons such remedies as cough lozenges. On the other hand, leading members of this Society have declared that (supported by a legal opinion obtained by the Privy Council) they do not regard such a remedy as paregoric elixir to be a poison within the meaning of the Act. The uncertainty of the chemist is shown by the fact that the British Pharmacopœia distinctly classes the above under the preparations of opium. (It contains 2 gr. of opium to each fl. oz.) The schedule of substances called "Poisons" by the Act of 1868 was drawn for the very different purpose of preventing the uncontrolled purchase by the public of substances which might be used recklessly or for illicit purposes.

"5. That the Government does not recognize such regulations and penalties as a matter of State necessity, is shown by further evidence besides the argument that it now only seeks to apply them to chemists whilst exempting the still larger body of medical practitioners. We allude to an Act passed in the last session of Parliament, intituled 'An Act to Regulate the Sale of Poisons in Ireland,' and in this Act no mention whatever is made of regulations for either storing or dispensing poisons.

"6. We must exercise the practical acquaintance with the subject, recognized by Parliament as belonging to our Society, by expressing our serious apprehension that the manner in which the Act proposes to carry out its object is fraught with great danger. The proposal to legalize certain 'poison bottles,' which a body of 10,000 men must use, and which they must explain to the public as being an absolute indication of danger, whilst the medical practitioners of the country will not use this danger-signal, would almost inevitably lead to a series of fatal accidents. We must solemnly place upon the promoters of the Bill this responsibility. Again, in the matter of fixing a particular day on which the circumstances which were legal on the previous day should become illegal and subject to penalty, we submit that hasty destruction of existing arrangements would in many cases follow, and that the gradual process now extending itself is much safer. Had there been any urgency in the case, we should have been prevented using, as we now feel it proper to do, the argument that, in relation to this subject as to religion, morality, public health, and many other questions, penal legislation is the weakest of the agencies that can be used to promote a good object.

"7. We have preferred to consider *the merits* of the question first, reserving until now the necessity alleged to be imposed by the Act of 1868. The feeling exhibited by our members at the present time contrasts with the absence of any objection in 1868 to the permissive power expressed in clause 1. This shows that no compulsory construction of the clause was then recognized by either of the members of this Society, or by the chemists and druggists generally; under any circumstances the latter, and much more numerous body, had no part in any communication which occurred in 1868, and may claim that the case be considered on its merits. We feel deep anxiety as to what would be the result of Parliament imposing upon our body this measure. It would wound deeply the *esprit de corps* which is so valuable in elevating the tone of a body of men with serious responsibility; it would leave the sense of suffering under an unequal and unjust application of control; it would embitter greatly our relations with a large portion of the medical profession, and would be a most unfortunate commencement of our connection with the medical officer of the Privy Council. As bearing upon the question of public health, our body comprises a very large amount of trained knowledge of chemistry available for the further service of the State in many ways in relation to the purity of air, water, sanitary reform, the adulteration of food, etc.

"We now leave our case in your hands, and earnestly trust that you may be satisfied that the Recommendations already issued, emphasized so much as they will have been by the matter coming before Parliament, will justify you in relying upon our disposition to promote the systematic storing and dispensing of powerful remedies, and in withdrawing the present Bill.

"We are, Sir,

"Your most obedient Servants,

"*Signed pursuant to a Resolution of and on behalf of the Council of the Pharmaceutical Society of Graat Britain,* } "A. F. HASELDEN, *President.*"

The subject of the Pharmacy Bill was discussed at some length.

The Council then adjourned until after the interview of the Parliamentary Committee with the Right Hon. W. E. Forster.

On re-assembling, Mr. Flux was requested to draw up a Report of that interview, and it was

Moved by Mr. Hills, seconded by Mr. Sandford—

That the Reports of the interviews held on Monday and this day with the Right Hon. W. E. Forster on the Amended Pharmacy Bill be printed in the Journal after having been submitted to him, and his consent obtained thereto.

For—

Messrs. Haselden, Hills, Sandford and Williams.

Against—

Messrs. Betty, Brown, Greenish and Reynolds.

The numbers being equal, the chairman gave the casting vote in favour of the motion.

Mr. Bottle did not vote.

The Reports are therefore published in pursuance of the above resolution, see page 13.

Moved by Mr. Reynolds, seconded by Mr. Betty—

That the memorial now forwarded to the Right Hon. W. E. Forster be printed, and a copy forwarded on Monday to every Local Secretary, and that a copy be sent to every member of the House of Commons not later than Tuesday.

For—

Messrs. Betty, Brown, Greenish, and Reynolds.

Against—

Mr. Sandford.

Messrs. Bottle, Haselden, Hills and Williams did not vote.

The motion was therefore carried.

The following petition was ordered to be presented:—

To the Honourable the Commons of Great Britain and Ireland, in Parliament assembled,

The humble Petition of the Council of the Pharmaceutical Society of Great Britain,

Showeth,

That whereas a Bill intituled "An Act to Amend the Pharmacy Act, 1868," has been passed through the House of Lords, and is now before your Honourable House, that the said Act contains provisions which will inflict grievous annoyance and injury on chemists and druggists, and that such provisions are in no wise necessary either for the safety of the public, or for the due carrying out of the provisions of the Pharmacy Act, 1868.

Your Petitioners therefore humbly pray that your Honourable House will refuse its sanction to the said Amended Act, or postpone its consideration, to enable evidence to be presented, by which your Petitioners will be able to satisfy your Honourable House that the said Amended Act is unnecessary and unjust.

And your Petitioners will ever pray.

Moved by Mr. Reynolds, seconded by Mr. Greenish, and

Resolved—That the President be authorized to sign the Petition to the House of Commons as now drawn up.

The Petition was forwarded to Mr. Alderman Lusk for presentation.

Deputations to the Right. Hon. W. E. Forster.

Monday, 19th June.

The President, the Vice-President and the Treasurer, accompanied by Messrs. Betty, Sandford and Williams, and the Secretary, waited on the Right Hon. W. E. Forster, Vice-President of the Privy Council, as per appointment, on Monday, June 19th, for the purpose of suggesting amendments in the Pharmacy Bill.

The first question discussed was the extension of the provisions of the Bill to all persons keeping open shop for the sale and dispensing of poisons.

Mr. Forster doubted whether on the part of the the Government, he could introduce such an amendment, but if introduced by an independent member, promised that he would give it his favourable consideration.

The second point was the omission of those words in the Bill which render the failure to obtain the consent of the Privy Council to regulations a ground for the Privy Council at once to frame regulations entirely independent of any consent or co-operation of the Council of the Pharmaceutical Society.

Mr. Forster objected to this course, but received favourably a suggestion that a delay of two months should be allowed to elapse before action could be taken by the Privy Council after notice of non-approval had been given to the Council of the Society.

A second proposition, to append the rules lately approved and recommended by the Pharmaceutical Society as a schedule to the Bill, was made by Mr. Forster.

A clause for enabling the Registrar to keep a more correct register was submitted to Mr. Forster, and had his approval.

Mr. Forster said that the Bill would be read a first time on that day and printed as sent from the House of Lords; it would not be read a second time until Monday the 26th inst.; and he would give the deputation another audience on Saturday next the 24th inst., at one o'clock, when he would be prepared to submit such alterations as he could propose.

Saturday, 24th June.

A deputation consisting of the following members of the Parliamentary Committee, the President, Treasurer, the Messrs. Bottle, Betty, Brown, Greenish, Reynolds, Sandford and Williams, accompanied by the Secretary and the Society's Solicitor, waited on the Right Hon. W. E. Forster on 24th June, as per appointment.

The President explained that since the former attendance of the Parliamentary Committee there had been a Special Meeting of the Council, at which certain resolutions had been passed and that, in accordance with one of the resolutions, a memorial had been prepared by the Council. He also said, that being one of those who waited upon the Right Honourable gentleman on Monday, he hoped that he (Mr. Forster) would favour them with his present views upon the amendments which had been suggested.

The memorial was then handed to Mr. Forster.

Mr. Forster having perused the memorial, and received explanations respecting some of its statements, said that he had expected to hear the provisions of the Bill discussed, and perhaps improvements suggested; and, with a view to the consideration of suggestions, he had arranged for the presence of Mr. Simon, and Mr. Jenkyns from the office of the Government draftsman. He should have been pleased to hear anything which might have been said by those desirous of improvement, but thought that there could not be useful discussion with a body of gentlemen who would only be content with the rejection of the Bill.

Mr. Williams suggested that gentlemen who wished to see the Bill improved were present, and that it was desirable that Mr. Forster should state what he might be prepared to concede.

Mr. Forster said that, whilst he should be happy to go fully into the matter with a deputation in favour of the Bill, and desirous of improving it, he must decline discussing modifications with a deputation committed to opposition.

Mr. Brown pressed Mr. Forster to concede delay in the second reading, and to consider whether public advantage might not result from delay until next session, when probably an improved Bill, satisfactory to the chemists and druggists generally, might be brought in.

Mr. Forster could promise that the Bill should not be read a second time before next Monday week (July 3rd), but could not consent to delay it until next session. He referred to the Act, and remarked that the intention of the Parliament of 1868, that there should be compulsory regulations, was shown by the first clause, and he did not think that the views of the present Parliament would be different. His individual judgment was with the clause, and in his official position he felt it to be a duty to give effect to the Act. He should be prepared to meet the opponents of the Bill if they would raise in Parliament the direct issue whether the legislation of 1868 should be revoked; but in any event, although the period of the year would be in favour of opponents to the measure, he must accept the issue, and, whilst conceding reasonable time, be understood as intending to press for the principle of the Bill.

Mr. Sandford urged Mr. Forster to state the points of concession which he was prepared to make.

Mr. Forster replied that he could not enter upon that course with direct opponents to the measure.

The committee then thanked Mr. Forster for the interview, and withdrew.

EXAMINATION IN LONDON.

June 21st and 23rd, 1871.

Present (21st)—Messrs. Allchin, Barnes, Carteighe, Cracknell, Davenport, Edwards, Gale, Garle, Hanbury, Haselden, Ince, Linford and Southall.

Dr. Greenhow was also present on behalf of the Privy Council.

(23rd)—Messrs. Allchin, Barnes, Carteighe, Cracknell, Davenport, Edwards, Gale, Garle, Hanbury, Haselden, Ince and Linford.

Ten candidates presented themselves for the Major Examination, and twenty-eight for the Minor; the following twenty-eight passed, and were declared to be duly qualified to be registered:—

MAJOR (as Pharmaceutical Chemists).

*Overton, Charles Arthur	Horncastle.
*Churchill, Henry	Reading.
*Pretty, Charles	Birmingham.
Walker, John Sydenham	Manchester.
Savory, Harry Banting	Painswick.
Wing, Lewis	Torquay.
Lake, Richard	Colchester.
Byles, James Henry	London.

* Passed with honours.

MINOR (as Chemists and Druggists).

	*Rammell, Edward	Crediton.
	*Hughes, James	Swansea.
	*Butcher, Henry	Sheffield.
	*Williams, Jabez Vivian	Ramsgate.
	*Wood, Alexander	New Brentford.
	*Beach, Tom Clarke	Great Malvern.
	Mills, Robert	London.
	Knight, John Tomlinson	Nottingham.
	Holme, William James	Bacup.
Equal.	Baldock, James Thomas	Rochester.
Equal.	Sharp, Alfred Joel	Spalding.
	Bradley, William	Dudley.
Equal.	Watmore, James	Wokingham.
Equal.	Wenham, George Daniel	King's Lynn.
	Tomlin, Albert Roberts	Barnsley.
Equal.	Cooper, William J.	Cockermouth.
Equal.	Goulden, Herbert	London.
	Jones, William Ellis	Barmouth.
	Dunn, Henry	Shipley.
	Rogers, John Maulden	Newport Pagnell.

The above names are arranged in order of merit.

FIRST, OR PRELIMINARY EXAMINATION.

The certificate presented by the undermentioned was received in lieu of this examination.

Haworth, James Bury........Camden Town.

ERRATUM.—Page 996, line 22, *for* Brown, James Macdonald, *read* Brown, John Macdonald.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

June 1st.—Professor FRANKLAND, F.R.S., President, in the chair. The following gentlemen were elected Fellows:—H. Adrian, H. Durham, G. Martineau, E. Neison.

Dr. DEBUS, F.R.S., delivered a lecture on "Ozone." The first who had observed that the passage of electric sparks through oxygen brings about a change in the properties of this gas was Van Marum. The next to take up the subject was Schönbein, in 1840. He ascribed the peculiar odour and the more energetic oxidizing properties of the altered oxygen to a substance which he termed ozone. He also found that ozone may be prepared by many other methods. His experiments, however, led to no positive results as regards the nature of ozone. It was through the researches of Marignac and De la Rive that ozone was shown to be nothing but an allotropic modification of oxygen.

Dr. Debus then discussed the question whether there existed another modification of oxygen called antozone, and answered the proposition negatively; the substance called antozone was only peroxide of hydrogen. The lecturer concluded by calling special attention to one of the characteristic reactions of ozone, viz. the decomposition of potassic iodide, which reaction is differently explained by the various observers. Schönbein has shown that potassic iodide protects free iodine against the action of potassic hydrate. It may be assumed that potassic hydrate and an iodine solution react upon one another thus:—

$$KHO + I_2 = KIO + HI,$$

and then—

$$KHO + HI = KI + H_2O;$$

if now an excess of potassic iodide be added, the potassic hypo-iodide and potassic iodide produce again potassic oxide (which becomes, in its turn, a hydrate) and iodine, and the excess of iodide prevents the action of KHO on the iodine, but not that of the latter on starch.

* Passed with honours.

CALIFORNIA PHARMACEUTICAL SOCIETY.

At the twenty-first Meeting of the California Pharmaceutical Society, recently held in San Francisco, the Constitution and Bye-laws, drawn up with a view to the incorporation of the Society, were read and approved, and the Committee empowered to take active steps to secure that object. The following report of the Executive Committee was also read:—

The Executive Committee of the California Pharmaceutical Society herewith present the Constitution and Bye-laws of the Society, amended with a view to the speedy incorporation of the Society, according to the laws of the State of California.

The Pharmaceutists throughout the country are gradually awakening to the importance of a thorough practical and scientific pharmaceutical education, in order to place the practice of pharmacy where it properly belongs —among the learned professions, a rank already accorded to it in most parts of Europe—and as to further develope this sentiment among our fellow-pharmaceutists was the prime motive in organizing the California Pharmaceutical Society, we regard it the duty and interest of all pharmaceutists to identify themselves with us.

That, in order to elevate the standard of pharmaceutical education in our midst, an institution aiming at the objects expressed in our Constitution is absolutely necessary, we think, all must concede.

The practice of pharmacy has been placed under legislative restriction in most parts of Europe, and, as is well known, sumptuary and restraining laws have been passed recently by the legislatures of various States of the Union; and a regard for our own reputation would seem to require us to prepare and offer a Bill providing for the examination and registration of apothecaries to the Legislature at its next session.

Knowing it to be the will of our organization that we enroll ourselves among the incorporate bodies of the land, that thereby we may strengthen and increase our influence, and provide for our future prosperity; and believing that our action herein is but the prelude to the early establishment of a College of Pharmacy, we offer this report with a sincerely expressed hope that the wishes of our hearts in the matter of the elevation of the character of the pharmaceutical profession in our State may be gradually and effectually accomplished.

(Signed) William Simpson, William Geary, W. T. Wenzell, William E. Mayhew, James G. Steele, *Committee.—Chicago Pharmacist.*

PHILADELPHIA COLLEGE OF PHARMACY.

At the Meeting held May 16th, 1871, Dr. Wilson H. Pile presiding, a paper was read by Professor Maisch, on the Seeds of a Species of Strychnos, brought to New York by a vessel from the East Indies, and exhibited at the meeting in February. He finds them destitute of the alkaloids.

Dr. PILE exhibited four specimens of syrup of iodide of iron, made with glucose, instead of syrup, which is directed in the U. S. Pharmacopœia. His object had been to ascertain whether the effect of such substitution would be to promote the preservation of the iodide without change. Three of the specimens had undergone more change of colour than would have been expected in the officinal syrup, and the other was nearly in the condition that would have been anticipated if prepared by the Pharmacopœia process.

S. MASON M'COLLIN stated that he used glucose as an addition to a variety of syrups, or rather to simple syrup to be used as a basis to medicated or flavoured syrups, with a view to giving it more body, without increasing the tendency to precipitate.

Dr. PILE called attention to the tendency to precipitate, which constitutes one of the difficulties in manipulating with the syrups of the phosphates, and inquired whether it might not be accounted for by impurities in the sugar. Some manufacturers of these preparations had assured him that they gave the preference to "Lovering's Sugar," and found no difficulty with it. T. S. Wiegand, Professor Parrish and others dissented from this view, stating that there was, according to their experience, very little difference between the products of the several sugar refineries that supply our market.

Professor Maisch having observed a crystalline precipitation in mixing solution of morphia with cyanide of potassium, exhibited the results of some of his experiments, and reported that hydrocyanate of morphia is nearly insoluble in water and in an excess of the precipitant, but dissolves readily in diluted mineral acids. The experiments were made with granular cyanide of potassium and with cyanide of ammonium, prepared from hydrocyanic acid and ammonia.

MEETINGS FOR THE ENSUING WEEK.

Tuesday July 4. ......*Society of Biblical Archæology*, at 7.30 P.M.—"On the Flora of Palestine." By B. T. Lowne.

Friday July 7. ....*Royal Botanic Society*, at 4 P.M.—"Economic Botany." By Professor Bentley.

Saturday ......*Royal Botanic Society*, at 3.45 P.M.

VACANCIES AND APPOINTMENTS IN CONNECTION WITH PHARMACY.

The Editor will be glad to receive early notice of any vacancies of pharmaceutical offices connected with public institutions, and likewise of appointments that are made,—in order that they may be published regularly in the Journal.

APPOINTMENT.

Dispenser for the Gambia Settlement; must have passed the Minor or Modified Examination of the Pharmaceutical Society. For particulars, see advertisement in the Journal of last week.

Parliamentary and Law Proceedings.

HOUSE OF COMMONS.

Pharmacy Bill.—*June* 22.—Petitions against the Pharmacy Act Amendment Bill were presented from—

Bolton-le-Moors, by Mr. Hick.
Brighton, by Mr. James White.
Bury, by Mr. Philips.
Crewe, by Mr. Tollemache.
Devonport, by Mr. J. D. Lewis.
Dewsbury, by Mr. Serjeant Simon.
Driffield, by Mr. Sykes.
Dundee, by Mr. Armitstead.
Eastwood and Bawtry, by Mr. C. Forster (for the Speaker).
Glasgow, by Mr. Graham.
Halifax and District, by Mr. Stansfeld.
Hampstead, by Lord George Hamilton.
Hyde, by Mr. C. Brooks.
Islington, by Mr. M'Cullagh Torrens.
Leamington, by Mr. John Hardy.
Lee, Lewisham, and Blackheath, by Mr. J. G. Talbot.
Leek, by Sir C. Adderley.
Maidstone, by Sir J. Lubbock.
Nottingham, by Mr. C. Seeley.
Oldham, by Mr. Hibbert.
Richmond, Yorkshire, by Sir Roundell Palmer.
Rochdale, by Mr. B. Potter.
Sittingbourne, by Mr. Pemberton.
Southport, by Mr. Cross.
Stockport, by Mr. Tipping.
Sunderland, by Mr. Candlish.
Wakefield, by Mr. S. Beaumont.

June 23.—Mr. W. M. Torrens gave notice that on the order for the second reading of the Pharmacy Act Amendment Bill on June 26, he should move that it be read a second time that day three months. Petitions against the Bill were presented from—

Bacup, by Mr. Holt.
Bayswater and Kensington, by Sir Henry Hoare.
Beverley and Bridlington, by Mr. Broadley.
Bishop Auckland, by Mr. Pease.
Brigg, Louth, and Barton-on-Humber, by Mr. R. Winn.
Cradley, Lye, and Quarry Bank, by Mr. Lyttelton.
Eastbourne, by Mr. Dodson.
Evesham, by Colonel Bourne.
Kendal, by Mr. W. Lowther.
Liverpool, by Mr. W. Rathbone.
Lytham, by Colonel Wilson-Patten.
North London and elsewhere, by Mr. M'Cullagh Torrens.
Plymouth, by Mr. Morrison.
Reading, by Mr. Benyon.
Scarborough, by Sir H. Johnstone.
Sheffield, by Mr. Hadfield.
Staleybridge, by Mr. Buckley.
Stockton-upon-Tees, by Mr. Dodds.
Swansea, by Mr. Dillwyn.
Todmorden and Selby, by Mr. Fielden.
Warminster, by Lord H. Thynne.
Woolwich and Plumstead, by Sir D. Salomons.

June 26.—The second reading of the Pharmacy Act Amendment Bill was deferred till Thursday, July 6. Petitions against the Bill were presented from—

Ashby-de-la-Zouch, by Lord J. Manners.
Ashton-under-Lyne, by Mr. Mellor.
Bewdley, by Colonel Anson.
Bideford, by Sir S. Northcote.
Blackheath, Lee, and Lewisham, by Mr. Mills.
Burnley, by Mr. R. Shaw.
Buxton, by Lord G. Cavendish.
Carnarvon, by Mr. Jones-Parry.
Clitheroe, by Mr. Assheton.
Council of the Pharmaceutical Society, by Mr. Alderman Lusk.
Durham, by Mr. Henderson.
Gateshead, by Sir William Hutt.
Helensburgh and Dumbarton, by Mr. Bouverie.
Heywood and Eccles, by Mr. A. Egerton.
Kentish Town, by Mr. T. Chambers.
Leeds, by Mr. Baines.
Lincoln, by Mr. Seeley.
Middlesborough, by Mr. Bolckow.
Newport, Isle of Wight, by Mr. C. Clifford.
Pembroke and Pembroke Dock, by Mr. T. Meyrick.
Ramsbottom, by Mr. J. Snowden Henry.
Reading, by Mr. Shaw Lefevre and Colonel Lloyd Lindsay.
Ringwood, by Mr. Cowper-Temple.
Spalding, Sleeford, and Heckington, by Mr. Welby.
Wandsworth, by Mr. Peek.
Whitehaven, by Mr. C. Bentinck.

June 27.—Petitions against the Pharmacy Act Amendment Bill were presented from—

Aylesbury, by Mr. N. de Rothschild.
Bath, by Sir W. Tite.
Barnstaple, by Mr. T. Cave.
Blackburn, by Mr. Hornby.
Boughton, near Faversham, by Mr. G. Milles.
Bradford, by Mr. W. E. Forster.
Canterbury, by Captain Brinckman.
Carlisle, by Sir W. Lawson.
Cleckheaton and Harrogate, by Mr. J. Fielden.
Coventry, by Mr. Eaton.
Derby, by Mr. Bass.
Dewsbury, by Mr. Serjeant Simon.

Dunfermline, by Mr. Campbell.
Forfar, by Mr. Baxter.
Goole, by Mr. Dennison.
Grossington, by Lord F. Cavendish.
Horncastle, by Mr. Chaplin.
Hull, by Mr. Clay.
Kidderminster, by Mr. Lea.
Kilburn, by Viscount Enfield.
Kingston-on-Thames, by Mr. Peek.
Macclesfield, by Mr. Brocklehurst.
Newcastle-on-Tyne, by Mr. Headlam.
Perth, by Mr. Kinnaird.
Peterborough, by Mr. Whalley.
Reading, by Sir F. Goldsmid.
Rochester, by Mr. Wykeham Martin.
Taunton, by Mr. Barclay.
Tewkesbury, by Captain Price.
Tunbridge Wells, by Mr. Dyke.
Wareham, by Mr. G. Sturt.
Winchester, by Mr. W. B. Simonds.

June 28.—Petitions against the Pharmacy Act Amendment Bill were presented from—
Abingdon, by Colonel C. L. Lindsay.
Bridgnorth, by Mr. W. H. Foster.
Bristol, by Mr. Kirkman-Hodgson.
Bury St. Edmund's, by Mr. Hardcastle.
Cardiff, by Colonel Stuart.
Chelmsford, by Lord E. Cecil.
Colne and Haslingden, by Mr. Holt.
Doncaster, by Mr. H. F. Beaumont.
Dorking and Farnham, by Mr. Cubitt.
Gainsborough, by Sir M. Cholmeley.
Greenwich, by Sir D. Salomons.
Gosport, by Lord H. Scott.
Ilfracombe, by Mr. Acland.
Knutsford, by Mr. W. Egerton.
Leominster, by Mr. R. Arkwright.
Liscard, by Mr. Laird.
Lowestoft, by Mr. Corrance.
Ludlow, by Lieut.-Colonel W. Clive.
Market Weighton, by Mr. Sykes.
Northallerton, by Mr. Hutton.
Northampton, by Mr. Gilpin.
Ross, by Sir J. Bailey.
Shaftesbury, by Mr. Glyn.
Stirling, by Mr. Campbell.
Stowmarket, by Colonel Parker.
Sydenham and neighbourhood, by Mr. Mills.
Tunbridge Wells, by Lord Holmesdale.
Walsall, by Mr. C. Forster.

Poisoning by Strychnia in Sweetmeats.

An inquest has been held in Brighton to inquire into the cause of death of Sidney Albert Barker, a boy about four and a half years of age, who died shortly after eating some chocolate creams, purchased at Mr. Maynard's, in West Street, with symptoms that seemed to point to poison as the cause of death. The following are the facts as they appeared in evidence:—

On Monday morning, about nine o'clock, Mr. Charles David Miller bought some chocolate-cream at Mr. Maynard's shop. He gave one of the drops to the deceased, who complained of its being "nasty," and his brother, Mr. Ernest Miller, spat one out as soon as he put it in his mouth. Notwithstanding this, however, Mr. Miller ate several of the drops himself, and shortly afterwards felt very unwell. A feeling of coldness suddenly came over him; he shivered all over, and his limbs became quite rigid. As these feelings recurred to him when he attempted to get from the chair in which he was sitting, a medical man was sent for. Mr. Tuke, surgeon, on his arrival, attributed these symptoms to nervousness, and said there was no harm in the chocolate. Mr. Miller, however, continued to feel very unwell throughout the day. In the afternoon some more of the drops were given to the deceased, who almost directly afterwards was taken violently ill, and cried and screamed in a most alarming manner. Then his feet began to stiffen and his face to become black. He was, thereupon, put into a warm bath with mustard in it, and Mr. Rugg, surgeon, having in the meantime been sent for, this gentleman on arriving, found the child in strong convulsions, and its bowels much distended. Before inquiring the cause, he was told the circumstance of the chocolate-cream, and how the uncle of the child had been taken ill in the morning. His first thought was to remove the poison (for that he supposed it to be) from the stomach, and for that purpose sent for an emetic which he prescribed from the nearest chemist. He at once applied cold vinegar-and-water to the child's head, but before the emetic arrived the child died.

The inquest having been adjourned, that the contents of the stomach might be forwarded to Dr. Letheby for analysis, was resumed on Thursday last.

Mr. Penfold watched the case on behalf of Mr. Maynard, and Mr. Gell on behalf of the father of the deceased.

Dr. Letheby, Professor of Chemistry at the London Hospital, said that he had examined the stomach of the deceased, and found that it presented a perfectly natural appearance, showing no signs of the action of any irritant mineral poison. On examining the brownish fluid smelling of chocolate, which, according to the label, was the contents of the stomach of the deceased, he found in it several pieces of meat partly digested, a small piece of lettuce, and three or four grains of wheat, whole. On analysing this fluid he found it to be perfectly free from mineral poison, but to contain nearly a quarter of a grain of strychnia, which would be quite sufficient to account for death. One of the other parcels he received from Inspector Gibbs contained four kinds of bonbons. The coloured ones, he found on analysis, to contain a preparation of alum and cochineal, but no poison. The white ones, or, at least, the one he analysed, contained strychnia. The third parcel contained two kinds of chocolate creams, rose-pink and white, but they were quite free from poison. The colouring matter, though containing cochineal, was prepared rather differently.

By the Coroner.—Strychnia would not be used in colouring sweetmeats, nor in flavouring them, for it is excessively bitter. It is used extensively in the preparation of vermin killers. The symptoms of the deceased, as shown by the evidence, are precisely those which would attend poisoning by strychnia, and there can be no doubt that that was the cause of death.

Mr. Tuke, surgeon, in answer to a question, said that he had given some of the chocolate to a dog, but it seemed to have no ill effect.

Miss Christiana Edmunds said that in September last she bought some chocolate creams at Mr. Maynard's establishment. On that occasion she ate two of them, and, about an hour afterwards, was seized with violent internal pains, and a burning in the throat, which lasted twenty minutes. She did not notice any unusual taste when eating them. On taking some brandy she became worse, and then took some castor-oil, after which she recovered. In March last, she tried some creams again, and a friend who was with her also tasted some of them. They had a strange nauseous metallic taste, and witness had no sooner swallowed a portion of one than she was seized as before, but more violently, and in a slightly different way. There was the same burning in the throat, and a feeling of lightness in that region. The saliva kept flowing into the mouth, and she was seized with a trembling all over, and felt an indescribable sensation. Her face also looked livid. She again took brandy-and-water with the same effect as before, and then trying the castor-oil, she gradually recovered. Her friend was affected in the same way, and took a glass of wine, which made her very sick, and she then also recovered. After the witness had got well, she noticed that her taste had gone, and it did not return for some little time. On the same day she took back the remainder of the chocolate-creams to Mr. Maynard, and told him of what had occurred. He assured her that she was mistaken in supposing that it was the chocolate-creams which had affected her in the way described. Some more were brought and tasted, but they seemed all right. Mrs. Maynard also tasted one of those which the witness had originally bought, and found that there was nothing the matter with it. Mr. Maynard told her he was much obliged to her for coming, and he would communicate with his French agents. He also said that he should be willing for her to have any analysis made that she desired. As she did not feel satisfied she went from Mr. Maynard's to Mr. Schweitzer's, and after telling him the circumstances, asked him to make an analysis. He treated the matter lightly at first, thinking her nervous and fanciful, but, after having tasted one of the creams, he thought differently. He afterwards forwarded her the following result of his analysis:—

"The cream cocoa consists of small, irregular, round cakes, filled with a soft white sugar composition. After examination, it was found that this white composition of some of these cakes, or balls, had a distinct metallic taste, whilst others were perfectly free from it. This metallic-tasting sugar composition, when washed out of the cocoa enclosure, gave, when filtered, a clear colourless solution of a sweet but slightly metallic taste; it had also a faint reaction on litmus paper. When somewhat concentrated by evaporation, it gave white flocculent precipitates with lime-water and with carbonated alkalies, the precipitate being soluble in excess of potash or ammonia. The precipitate produced by sulphuret of ammonium had also a white colour. Chlorine and sulphuric acid were only present as traces. The metal with which the so-called cream of some of the cream-cocoa balls is impregnated is, in fact, zinc, in combination with a vegetable or organic acid. It appears that this cream must be prepared in zinc vessels, where, when left long in contact and acid, those portions which are in contact with the sides of the vessel become impregnated with it, and when scraped off and introduced in the cocoa coating it, imparts to them a highly poisonous character."

In answer to Mr. Penfold, Miss Edmunds stated that she did not communicate the result of the analysis to Mr. Maynard, as he seemed so sceptical and prejudiced about it.

Mr. Julius Schweitzer, analytical chemist, King's Road, was then called, and stated that the above was the result of his analysis. In answer to the Coroner, he said that the metallic poison he found in the creams was an entirely different substance from the strychnia which Dr. Letheby found in those he had examined. In answer to Mr. Penfold, this witness said that he did not take any steps to have the result of his analysis communicated to Mr. Maynard.

Mr. Penfold then asked that Maynard, and one or two of his assistants might be called to speak to the circumstances under which the chocolate was received and sold in his establishment.

Mr. Maynard accordingly stated that he was a confectioner at 39, 40, and 41, West Street. After Miss Edmunds had complained of the chocolate-creams he caused a thorough investigation to be made, and he and his wife and Miss Page, one of the assistants, tasted a great deal of the stock, and could find nothing the matter. He was always particular to make a thorough investigation if ever a complaint was made. He had never manufactured any chocolate-creams himself, but always obtained them wholesale. Since February last he had obtained all his French sorts from a wholesale dealer in London; and he was positive that there was none of the previous stock now in the shop, for owing to the war they had been completely sold out about a fortnight before he obtained his supply from the new source. When the present stock was received in February it was handed over to Miss Page, and it would be proved that it was from some of these that Mr. Miller was supplied with the creams, which he gave to the deceased. When he spoke as though he had received complaints previously he meant such as of the sweetmeats being flavoured with the wrong substance. Miss Edmunds' complaint was the first of that character that he had received. He had a young family, and his youngest boy was in the habit of continually eating these very chocolate-creams. He had never been troubled with rats nor with mice in the shop, as he kept a cat for the purpose of destroying them. About a month ago some phosphoric paste was put in a pot-room, quite away from the shop, and on a different story, where the cat could not get.

The Coroner remarked that it was evident that phosphoric paste had nothing to do with the strychnia, and that Mr. Maynard was more fortunate than the chocolate manufacturers in France, for there they found that nothing but sheet-iron would keep the rats out.

By Mr. Gell.—When we found, after Miss Edmunds' complaint, that there was nothing the matter with the rest of the stock, and not receiving any communication from her, we thought it was all fancy, and did not have any analysis made. The boxes of chocolate-creams that I have in my shop with the "Cadbury" label are English. The cakes are smaller, and in my shop the two sorts are kept entirely distinct.

Miss Kate Page, assistant to Mr. Maynard, was then called, and said that the French chocolate department was under her management, and after the goods were received from London they were placed in cases in the store-room. The average sale of French chocolate-creams was about four pounds a week. The English sort is made up in smaller cakes, and is all white, the pink colour being confined to the French. She could speak positively to all the glasses being empty before the fresh stock was received in February, because they cleared them all out for a gentleman.

By the Coroner.—I cannot suggest any way in which the strychnine could have got into the chocolate while it was on Mr. Maynard's premises, for no one had anything to do with it but myself.

Annie Meadows, the assistant who sold the creams to Mr. Miller, said that she took them out of the case which the last witness had filled. She asserted that those she gave to Mr. Miller were all white, but the Coroner stated that that gentleman had said that Mr. Maynard did not sell any with an ornament on the top, like some which it was stated that Mr. Miller had produced on the last occasion.

Mr. Ware, the manufacturer of these chocolate-creams, said that he had been engaged in business since 1839, and had never had any complaint of this sort made before, though they had made hundreds of tons of the chocolate-creams. He then described the process of manufacture. The white or creamy part, he said, was pure sugar boiled down to a certain pitch, and then treated with cream of tartar to "kill the grain" of the sugar. The colouring-matter in the pink kinds was cochineal or carmine, and the flavour was imported by vanilla, otto of roses, or liqueurs. The chocolate of their manufacture was called French because they used French machinery. He admitted that they were troubled with rats, but not to any great extent. They used dogs, traps, and poison to exterminate them, but as the workmen were paid so much for each one they destroyed, he could not say what sort of poison they used. He remembered some paste being spread on bread-and-butter. All the mixing required in the chocolate manufacture was done on marble slabs.

The Coroner then summed up. He said that as to the cause of death there could be no doubt, for sufficient strychnia had been found in the stomach to kill a child of that age, and the quantity found in the stomach after death was frequently but a fraction of the quantity that had been absorbed into the system. As to the way in which the strychnine was administered, that also was perfectly clear. It must have been by means of the chocolate-creams, but how it got into them could only be a matter of conjecture, and the most reasonable hypothesis was that it was through some misadventure with the vermin poison. But how that got there, there was no evidence to show. They would also have to consider whether any one had been guilty of criminal negligence. The fact of the manufacturer having been established in business thirty-two years, and never having had a complaint previously, was sufficient to show the manner in which his business was conducted, and, therefore, to exculpate him. Mr. Maynard had taken every reasonable precaution, after Miss Edmunds had complained to him; and though it was certainly unfortunate that neither she nor Mr. Schweitzer had thought of communicating the result of the analysis to him, yet, strange to say, the poison discovered on that occasion was evidently quite different from that which had caused the death of the deceased, and must have found its way in a different way. He, therefore, recommended them to find a verdict in accordance with the medical evidence as to the cause of death, and stating that there was no evidence to show how the strychnine got into the chocolate.

The Foreman of the Jury said that they fully agreed with the Coroner's remarks, but would wish to add a suggestion to their verdict, that great care should be taken in using vermin poison at the place of manufacture.

Mr. Penfold wished to state that Mr. Maynard would at once destroy the whole of his present stock of French chocolate.—*Brighton Daily News.*

Suicide by Phosphorous Vermin Killer.

An inquest has been held at Tweedmouth upon the body of Jane Weatherhead. It appeared that the deceased, having had some little difference with her husband, left her home and went to stay two or three days with some friends. Upon returning home her husband noticed that her lips, teeth and tongue were black, and asked her what was the matter. She replied that she had taken poison at Kelso two days previously, in the form of vermin killer. Medical assistance was obtained, but she died the next day.

Dr. Brown said that he found the deceased in a state of collapse, pulseless and breathing heavily; her eyeballs were dilated and she was almost unconscious. He tried to get her to swallow a little milk but she could not. He examined some of her vomit: it was of a dark coffee colour, and had the appearance of containing some undigested blood. He was told that deceased had taken some "vermin destroyer," and that it was a paste. From the appearance and symptoms he was of opinion that the deceased died through poisoning by phosphorus. He considered the case hopeless from the first.

The jury returned that the deceased died from the effects of phosphorus taken while in a state of insanity.

Adulteration of Bread with Alum.

At the City Police Court, Manchester, charges were recently brought against two bakers of having adulterated bread by the admixture of alum. Loaves of bread, which had been purchased at the shops of defendants, were submitted to analysis by Professor Roscoe, who deposed that he had found in the different samples 13, 12, and 4 grains of alum to the pound respectively. In one case it was submitted that in order to convict it must be proved that the defendant was cognizant of the presence of alum in the flour. The magistrate, however, decided that it was the duty of the baker to take care that the flour had no alum in it. A fine of £5 was inflicted in each case.

Review.

Contributions towards the Materia Medica and Natural History of China, for the use of Medical Missionaries and Native Medical Students. By Frederick Porter Smith, M.B. London, Medical Missionary in Central China.—Shanghai: American Presbyterian Mission Press.—London: Trübner and Co., 60, Paternoster Row. 1871. Pp. 237.

This work is the result of the leisure moments of two years spent by the author at the great trading city of Hankow on the banks of the Yang-tse-kiang, some hundreds of miles from the sea. It forms a neatly printed volume in which are arranged in alphabetical order the names either in English or in Latin of a variety of substances, most of which are either found in the drug shops of the Chinese or in the dispensaries attached to the Mission Hospitals. Each name is followed by a Chinese equivalent expressed in native characters. As most of the chemical substances employed in European medicine have no Chinese names, and as the sound of Latin or English words is often inexpressible by Chinese characters, special names framed according to Chinese ideas have been invented. Thus Iodine is termed *Hai-tien* i. e. *Sea-indigo;* Sulphuric acid, *Liu-hwang-yu* i. e. *Sulphur-oil;* Lunar caustic, *Yin-siau* i. e. *Silver-nitre.* Even Chlorodyne is put into Chinese as *Poh-ho-yoh*, literally *Peppermint-medicine.*

Following the name are remarks descriptive of the history and uses of each article. As a specimen we may quote the following:

> "**Sal Ammoniac.**—*Nau-sha, Nung-sha, Peh-ting-*
> "*sha.*—This saline substance, the chloride of ammonium
> "of chemists, is brought from Lan-chau-fu and Ning-
> "hia in Kan-suh. The country of the Tih, or Si-jung,
> "and Turfan formerly yielded it. The volcanic moun-
> "tain of Peh-ting in Turfan is said to have yielded some
> "ammoniacal salt from fissures in its sides, and hence
> "the name *Peh-ting-sha*, more correctly given perhaps to
> "volcanic ammonia. The Chinese name *Nau-sha* is very
> "like the Hindustani names *Naushadar* and *Nausadar*,
> "given to thick, fibrous, translucent cakes of this crude
> "salt of ammonia obtained in India from the unburnt
> "extremity of brick-kilns in which the manure of camels
> "etc. is used as fuel. (Dr. Waring's Ph. of India, p. 309.)
> "Keferstein affirms that both carbonate and muriate of
> "ammonia are found in China, but the dirty-white, rough,
> "deliquescent salt commonly sold under this name is
> "nothing but sulphate of soda, or common salt. Nitre
> "(soda-nitrate) and borax are also confounded with it.
> "It is used as a flux or solder, or is said to be so em-
> "ployed. Whilst the salt is said to be deleterious, it is
> "also said to be used in curing meat, or as a condiment.
> "It is mainly used as a solvent for opacities of the
> "cornea, for which the sulphate of soda acts almost as
> "well. It acts as a sedative, resolvent, deobstruent,
> "pectoral and mild escharotic, in Chinese estimation.
> "They use it in veterinary practice. Some of the
> "samples contain iron, and resemble the *Kala Nimuk*
> "of India."

Several of the substances used in Chinese medicine described some years ago in the pages of this journal are further illustrated by the researches of Dr. Porter Smith. Thus the seeds called *Fe-tsaou-tow** are referred by him to *Acacia concinna* [DC.], with the information that the pods containing them are used instead of soap in the washing of clothes, but from their strong smell are not allowed in the public baths. The root known as *Tsing-mŭh-heang* noticed in one of the papers referred to,† is stated by our author to be that of *Aristolochia contorta* [Bunge], but he does not say how this point was settled, or give any particulars as to the cultivation or collection of the plant. By the *Trade Report of Ningpo*

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* Ph. J. III. (1862) 8. † Ph. J. III. (1862) 264.

for the year 1868,* we learn however from Mr. Bowra, the Acting Commissioner of Customs, that this drug is an esteemed remedy in rheumatism, and that it is exported from Ningpo to the value of about £26,000 annually.

Concerning *Arrowroot*, our author remarks—"The ordinary native farina called by this generic name "amongst foreigners, is made by grating the root of the "Lotus or *Nelumbium speciosum*, grinding it to a coarse "powder, and levigating it in the ordinary way. . . . "The product is a reddish-white, glistening, unctuous "powder, making a very tenacious jelly of a dark colour. "It answers all the purposes of the best arrowroot, and "is of great value in the treatment of diarrhœa and "dysentery"—but he adds that it is so frequently adulterated with "leguminous farina," that most families endeavour to make it for themselves. No starch appears to be extracted from *Sagittaria*.†

It would have added much to the scientific value and interest of Dr. Porter Smith's work had his statements been a little more *personal*. One is constantly tempted to ask—How did you make out this? As an example,—Common camphor our author asserts is produced in the provinces of Fuhkien and Canton. But on what evidence was this determined? The official *Reports on Trade* published by the Inspector General of Customs‡ show no camphor as shipped from any one of the twelve Treaty Ports of Continental China, but only from the island of Formosa. Dr. Smith then adds that *Borneo Camphor* "is said to come from Chang chau fu in Fuh-"kien, and the tree yielding it, the *Dryobalanops Cam-"phora*, is described as growing in Canton province." We need hardly say that such statements as these are loose and vague, and quite unworthy an important book of reference.

The assertion that the rhizomes of *Iris Florentina*, (a plant not known to exist eastward of the Mediterranean region) "are met with all over China," and a similar remark regarding *Oxalis Acetosella* indicate a want of exactness in discriminating drugs and plants that is calculated to impair confidence in other statements.

We must also raise a protest against the omission of authorities for botanical names which are thus involved in considerable doubt. What plants are *Agave chinensis*, *Smilax chinensis*, *Amomum amarum*, or *Salvia multiorhiza*?

But even with the defects which we have thought it right to notice and which we trust the author will avoid in a future edition, we gladly admit that Dr. Smith's *Contributions* contain a large amount of interesting and useful matter which it must have required no small amount of diligence to collect and arrange. The book is superior to Debeaux's *Essai sur la Pharmacie et la Matière Médicale des Chinois* (Paris, 1865) in that it gives the Chinese characters as well as their sounds expressed in Roman letters, and is besides far more copious. It promises also to be of considerable utility to young Chinese who may study European medicine.

BOOKS RECEIVED.

Pisciculture dans l'Amérique du Nord. Par M. J. Léon Soubeiran. From the Author.

Storia della Farmacia e dei Farmacisti appo i Principali Popoli del Mondo. Per Frederigo Kernot. Naples. 1871. From the Author.

* *Reports on Trade at the Treaty Ports in China for the Year* 1868, Shanghai, 1869. P. 51.

† Some continental authors, puzzled to explain the origin of the English word *arrowroot*, have adopted the notion that it may be, or once was, derived from the Chinese Arrowhead, *Sagittaria chinensis*, Sims, overlooking apparently the fact that arrowroot neither is nor was imported from China, but from the West Indies.

‡ Shanghai, 1867. Analysis of Chinese Commerce during 1866, pp. 130-131.

Notes and Queries.

*** *In order to facilitate reference, correspondents are requested to mark their answers in each case with the title and number of the query referred to.*

No notice can be taken of anonymous communications. All queries or answers should be accompanied by the name and address of the writer.

[228.]—SYRUPUS TONICUS.—It may interest Mr. Symes to hear that this syrup was by no means introduced here from Birkenhead, but was first prescribed in January, 1866, by Dr. Crompton, at whose request I prepared it, and who (for reasons stated in his letter here enclosed) called it tonic syrup, of which title Dr. Crompton was certainly the originator.—James Woolley, *Manchester*.

[*** In the letter which has been forwarded to us, Dr. Crompton says:—"I have to observe respecting the imputation conveyed in the note of Mr. Symes, of Birkenhead, that I gave you the formula for syr. ferri et quinæ et strychn. phosph. in the year 1865, and that I at first prescribed it under that title; but, finding it too long, and to be objectionable by containing the word 'strychnia,' I began to prescribe it as 'syrupus tonicus' in 1866, under which name you introduced it to the profession by a printed circular."—Ed. Pharm. Journ.]

[264.]—DISPENSING.—Having just received the undermentioned prescriptions to dispense, I should feel obliged by being informed in the Journal the best way to dispense them.—Jno. Smith.

R. Tinct. Tolu. ʒiss
Tinct. Scillæ ʒj
Syrupi ʒvj
Aq. Cinnam. ad ℥vj.
M. Take a sixth part three times a day.

R. Kreasoti gtt. iij
Zinci Oxydi gr. iij
Mist. Acaciæ q. s.
Mitte xxiv.
M. ft. pil. Take one three times a day with meals. Silver, and send in bottle.

[265.]—DISPENSING.—I received a few weeks ago the following prescription to dispense (a photograph of which I enclose):—

R. Iodi ʒss
Lin. Camphoræ comp.,
Lin. Saponis comp., ana ℥ij.
M. ft. Linimentum pectore infricandum.

At first sight, it may appear that no particular caution is necessary as to the manner in which the ingredients should be brought together, but such is not the case. If mixed in the same order in which they are written, (in many instances this is likely to be the case,) a black precipitate will be thrown down, consisting of iodide of nitrogen, a highly explosive compound, produced by the reaction of the ammonia contained in the lin. camph. co. with the iodine.

Foreseeing the result likely to ensue, I dissolved the iodine in the lin. saponis, and then added the lin. camph. co.: no precipitate was formed. I then, by way of experiment, mixed a small quantity in the reverse order (that in which they were written); a precipitate was immediately produced, which, upon drying and being touched, exploded with a very loud report. I may add that, in whatever order the ingredients are mixed, the liniment speedily decomposes, losing in a day or two nearly all its free iodine.

I have not come across a prescription of the kind before, so have sent it, thinking that it might perhaps be of use to others.—E. Skipper, *Islington*.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Lemon and Lime Juice.

Sir,—In reference to your article on lime and lemon juice, I may mention that some time since my attention was drawn to the subject, with the idea of finding a substitute for the horrible mixture of lemon juice and rum with which our sailors are now drenched by Act of Parliament.

As there is no virtue in citric acid, it struck me that, perhaps, the value of lemon juice as a prophylactic was due to the potash it contains in combination with an organic acid, and that citrate of potash would answer every purpose. I was further confirmed in this view by the writings of Dr. Garrod, and some experiments made with Mr. Deane, of Clapham, upon the salting of meat. From an analysis by Professor Attfield of some beef broth before and after salting, it appeared that the meat lost nearly 50 per cent. of its potash by the process, and that as the soda salt went in the potash salts ran out; this deficiency of potash, we thought, might probably be the cause of scurvy. Following up this idea, I then had some citrate of potash prepared, and through the interest of the Board of Trade some experiments have been made at the "Seamen's Hospital" to test its value.

These experiments have now been carried on for about twelve months, and through the kindness of Mr. Harry Leach, I have obtained a report of the result. Owing to the singularly few cases admitted to the Hospital during the past year, the trials have not been so numerous as we could have wished; still, in all cases, it has been found equally efficacious as the juice; patients treated with citrate entering and leaving the hospital on the same day as those treated with lemon juice. It is true that too much stress must not be laid on these experiments, as there is some doubt as to which does most to promote a cure, the lemon juice or the extra good diet.

I must here leave the matter, as I have no means of testing its value as a prophylactic, but I think it well worth a trial; and if some large shipowner would take it up and try one against the other during a lengthened voyage, the case might be at once decided; and if the citrate should answer the purpose, then the "lemon juice and rum" might be done away with for ever.

This question also involves one as to the use of light wines, such as claret and hock, in gout, rheumatism, etc. May not their virtues be due to the bitartrate of potash they contain?

35, Ovington Square. Robert Palmer.

Poison Regulations.

Sir,—What a terrible fuss the people are making in the Journal about the poison regulations!

I think there is no great objection to those proposed by the Council, beyond the dislike of all interference common to all Englishmen; also, that some precautions are necessary. We all know that twenty years ago in many establishments no precautions whatever were taken; for instance, in the one in which I was apprenticed in London.

Fifteen or sixteen years ago it was held by many (including ourselves), that the greatest safeguard was in sufficient education and attention to what one was about and the use of one's senses. Before I left England, however, poison cupboards were coming into vogue.

In my dispensary I adopt a plan which I have not seen mentioned by any one. It is very simple, and is this:—Poisons that I am afraid of, such as strychnia, arsenic and hyd. bichlor., acetum canth. fortiss. and iodine paint, I put behind the ordinary row of bottles, so that to get at them I have to take down a bottle or two in front. In this manner the space behind the bottles becomes the "poison cupboard," and the front row of bottles the door. I think the plan gets rid, to a certain extent, of the difficulty I have lately seen mentioned, viz. that if all the poisons had to be fetched in as wanted, the risk of accidents from accumulations on the counter would be greater than if the poisons were kept on the shelves, as the dispenser might wait for a spare moment to put his poisons back into their cupboard; whereas, in my plan, they can be (as they should be always) put away directly they are done with. Kaffraria.

King William's Town, April 28th, 1871.

New Pharmacy Bill.

Sir,—The Hull petition against the "new Pharmacy Bill" is signed by eighty-nine chemists in business, only one refusal having been met with. The smaller towns in East Yorkshire are moving, and every place of importance will have its petition. Our county and borough members are with us, and the trade is becoming thoroughly roused. During forty-five years I have been connected with the business, I have never seen anything like it. Lancashire and Yorkshire are sound on the matter, and the white and red rose are twined together to defeat, if possible, this unnecessary and impracticable Bill.

The wholesale case of poisoning at Bradford, referred to by the Right Hon. Mr. Forster, occurred in the "dark ages," thirteen years ago, the arsenic having been purchased at the shop of general dealer and druggist in a neighbouring village during the absence of the master. In that case, the one element necessary to have avoided the accident was education, which, under the Act of 1868, is now compulsory; and it is hard that just when we in the provinces are beginning to realize the necessity of education, and active steps are being taken to found lectures, classes, etc., we are suddenly called from our profitable and peaceful labours to take up arms in defence of our common liberties.

I do not hesitate saying that a heavy blow and sore discouragement have been inflicted on technical education by this uncalled-for attempt at penal and restrictive legislation, to be followed, no doubt, by other and more severe Acts.

As one of the founders, and for twenty years a local secretary of the Pharmaceutical Society, I have always looked upon it as a great educational institution, and, much as I regret the failure of the Council to understand the difference between town and country trade, I believe a considerable measure of success has attended their efforts to elevate the trade, and to impress upon us a due sense of our responsibility. If, however, the present Bill should pass, the Society would become little more than an institution under the coercive action of the Privy Council, or, rather, its restless medical officer, for prying into, and attempting to regulate all the petty details of ten thousand widely-differing businesses; and I can hardly conceive that any man, having a proper feeling of self-respect, or a due regard to his independence, could in such case consent to sit at the Council Board.

No case for parliamentary interference has been made out; and if danger to the public in the dispensing and storing of poisons does exist, it is far less likely to be in the open shop of either the chemist or the surgeon than in places closed to the public eye. In this town, on a careful estimate, it appears that not more than one-eighth of the medicine supplied is dispensed by chemists, and I have little doubt this is a fair specimen of other towns (perhaps London excepted). Can anything more strongly show the inutility and onesidedness of the proposed Bill? Looking at the serious liability now resting on dispensers of medicine, we may well ask to be let alone. Neither surgeon nor chemist needs an Act of Parliament to sharpen his sense of responsibility in dealing with poisons. In the words of the late Jacob Bell (referring to the Bradford case), "With persons acquainted with the nature and properties of poisons, and duly impressed with their responsibility as vendors of such substances, no stronger motive for caution could exist than the dread of a verdict of manslaughter or absolute ruin as the probable result of a fatal accident arising from negligence on their part."

Hull, June 28th, 1871. James Baynes.

Ice Cream Soda.—We think the doubt would still obtain since the preparation would be used more as a beverage than as a medicine.

T. Hughes.—The remarks contained in our correspondent's letter are open to be regarded as personal reflections. We think it advisable that they should not be published.

"*Manipulator.*"—By referring to the Index accompanying the present number you will see that the formula has been given, and repeatedly commented upon very recently.

R. Gleave, Hulme.—You will find the method given in the "Notes and Queries" column of a recent number.

J. Beaton.—We do not think it advisable to publish your letter, as it contains some personalities.

"*Subordination.*"—We decline to publish any letters containing remarks which may be considered personal.

Communications, Letters, etc., have been received from Mr. Poland, Mr. F. Wheeler, Mr. Savage, Mr. Godfrey, Mr. R. Mumbray, Mr. Barth, Mr. Edwards, W. H., E. H. C., J. S.

MATCHES.

BY B. S. PROCTOR.

O Lucifer, how art thou fallen!
Only one penny per box!

The history of the means of getting a light is full of interest in whatever aspect it be viewed; perhaps more interesting to pharmacists than to ordinary mortals, seeing how intimately each step in advance is associated with the progress of chemical and physical discovery; how much the match trade of the last forty years has been connected with the trade of the chemist and the part which has been taken in the development of the same by men well known amongst us. Leaving to our contemporaries the treatment of this subject in its commercial and mechanical aspects, we propose to sketch briefly the chemical history of the art of kindling a flame, from the time when old women were given to making matches to the present day, when the lads and lasses have a good deal of the work in their own hands.

When the first fire was lighted, and who lit it, are questions over which physics and divinity might quarrel without coming to a conclusion; but looking to nations (if our modesty will permit us) which are too young in civilization to wear any clothes, we commonly hear of their fires being ignited by rubbing two dry sticks together till the heat of friction produced fire. The mode of rubbing which is capable of producing sufficient of that "mode of motion" which is known as heat, is difficult of acquirement; and though most of us have tried the experiment in our school days, he was thought very successful who could produce smoke enough to make his eyes water; it is doubtful whether success might have rewarded our efforts, even had we attended to Pliny's recommendation, "rub the wood of the ivy with that of the laurel," so much do we lose the arts of former times when modern inventions enable us to attain our ends with less labour. These dry frictions were only slowly displaced by the use of the flint and steel, which depend upon the same physical principle. A small particle of a hard metal being struck off from the mass by the edge of a stone harder than itself, the particle was always hot, frequently hot enough to enter into active combustion; this, however, produced a short-lived spark, which was only available if received upon some substance very readily ignited and of small conducting power, the material most approved for this purpose being tinder, a charcoal produced by the imperfect combustion of old linen. When the young spark was well received he seldom failed to kindle a match—the matches for this purpose being slips of wood, ten times as large as the lucifers of the present day, pointed at one or both ends and dipped in sulphur. The tinder-box, with its flint and steel, though a great advance upon the friction woods of the early ages, was often troublesome, especially in damp weather, when the tinder absorbed moisture and was slow to ignite. Substitutes for it were constantly sought, but for a century and a half the numerous inventions failed to displace the tinder-box from its post on the kitchen mantelshelf.

Phosphorus, which was discovered about two hundred years ago, kindled the hopes of the fire-seekers, but for a long time it did not kindle much else, for it was very expensive and very dangerous to handle. So lately as fifty years ago nothing else was known in practice but flint and steel, phosphorus matches not being introduced commercially till 1834, and being prohibited in several of the German States on account of their danger up to the year 1840; but during the time phosphorus was in abeyance, much was done with other materials.

Doebereiner, and his wonderful lamp, may claim our first notice. The lamp consisted of a bell-glass immersed in sulphuric acid, and having a piece of zinc suspended in it, so that it generated hydrogen, until the accumulated gas having displaced the acid stopped further action. The bell was fitted with a cock and a piece of spongy platinum, the latter being usually attached to a little piece of mechanism, by which it was brought in front of the cock at the moment the gas was turned on; the gas was thus ignited, and in turn lighted a candle placed in front of it.

Doebereiner's lamp stands quite apart from the other fire-producing contrivances. It depends upon the power possessed in a small degree by many bodies, but in an eminent degree by platinum, of so condensing certain gases upon its surface as to enable them to exercise their chemical affinities much more energetically than in the free or uncondensed state, and depends upon this property being so much exalted by the reduction of the platinum to a spongy condition, that it becomes incandescent when exposed to a mixture of hydrogen and air.

The pyrophori, which were made by heating tartrate of lead, or a mixture of potash, alum and organic matter, in close vessels till they ceased to give off inflammable gases, depended also for their fire generation upon a finely divided metal mixed with carbon; but in this case the metal had not a mechanical but a chemical affinity for oxygen, and as soon as exposed to the air the absorption of oxygen was so rapid as to produce a smouldering combustion.

Phosphorus bottles, which were in vogue during the early days of phosphorus, were too dangerous, both in their production and use, to be much more than philosophical toys. They were made by melting together phosphorus and sulphur in a bottle (which it is said was sometimes blown to pieces in the operation), the sulphide of phosphorus thus produced being readily ignited by friction. The light was obtained by dipping a splinter of wood into the compound, and thus lifting out sufficient to produce the desired fire by rubbing upon any convenient surface; or a bottle, when lined with phosphorus alone, or mixed with one-fourth of wax, was capable of igniting a common sulphur match, if rubbed upon its inner surface.

(To be continued.)

British Spirits.—An annual return shows that in the year 1870 30,220,268 gallons of proof spirits were distilled in the United Kingdom: 7,479,422 gallons in England, 14,483,744 gallons in Scotland (nearly half the production of the United Kingdom), and 8,257,102 gallons in Ireland. Duty was paid in the year on 23,452,242 gallons, amounting, at 10*s.* per gallon, to £11,726,120. The consumption of British spirits in the year is stated at 22,616,490 gallons, viz. 11,940,083 gallons in England, 5,501,987 gallons in Scotland, 5,170,700 gallons in Ireland. 1,633,219 gallons were removed in the year from Ireland to England and Scotland, and no less than 4,258,097 gallons from Scotland to England and Ireland; 125,377 gallons from England to Scotland and Ireland. At the end of the year there were 16,941,149 gallons of British spirits in bonded stores in the United Kingdom ready to supply thirsty souls in 1871.—*Times.*

Chapters for Students.

CHEMICAL NOTES TO THE PHARMACOPŒIA.

BY WILLIAM A. TILDEN, D.SC. LOND.

DEMONSTRATOR OF PRACTICAL CHEMISTRY TO THE PHARMACEUTICAL SOCIETY.

Iodum.—[§ A non-metallic element, obtained principally from the ashes of sea-weeds.] I = 127. By the incineration of sea-weeds a semi-fused saline ash is obtained called 'kelp.' This is lixiviated with water, and the solution so obtained concentrated till, by alternate boiling and cooling, the crystallizable salts, potassic and sodic sulphate and chloride, are almost completely separated. The mother liquors are then mixed with sulphuric acid, whereby the carbonates and sulphides present are decomposed, and the mixture is then distilled by a very gentle heat with regulated quantities of black oxide of manganese.

$$2\,NaI + MnO_2 + 3\,H_2SO_4$$
$$= 2\,NaHSO_4 + MnSO_4 + 2\,H_2O + I_2$$

The iodine is purified by careful resublimation.

[§ In laminar crystals of a peculiar odour, dark colour and metallic lustre, which, when heated, yield a beautiful violet-coloured vapour, very sparingly soluble in water, but freely dissolved by alcohol, by ether and by a solution of iodide of potassium. The aqueous solution strikes a deep blue colour with starch.] The colour is destroyed by heat, and therefore cold solutions must be employed for this test. Iodine is also freely soluble in bisulphide of carbon and in benzol, minute quantities communicating to either of these liquids a beautiful violet tint, upon the production of which another very good test for the recognition of iodine and iodides is founded. For a comparison of the properties of chlorine, bromine and iodine, see article Bromum, p. 526, Vol. I. n.s. Iodine stands a little apart from the other two in possessing less energetic affinities, so that its compounds are more readily decomposed, and it exerts no bleaching action upon vegetable colours.

[§ It sublimes without leaving any residue, and the portion that first comes over does not include any slender colourless prisms emitting a pungent odour.] By these tests non-volatile impurities, such as oxide of manganese or of iron, metallic iodides, etc. are excluded; the pungent crystalline body mentioned is iodide of cyanogen, an impurity commonly met with, even to a considerable extent, in crude iodine. A test should be added for the detection of the small quantity of chlorine which commercial iodine almost always contains. The following would be delicate enough for practical purposes:—A small quantity mixed with a slight excess of sulphurous acid gives a colourless solution, which, with nitrate of silver, strongly acidified by nitric acid, gives a yellowish-white precipitate of iodide of silver. This precipitate, after removal of the supernatant fluid, is insoluble in ammonia, and the ammoniacal liquid decanted gives no appreciable precipitate upon acidification by nitric acid.

[§ 1·27 gram dissolved in an ounce of water containing 20 grains of iodide of potassium requires for complete discoloration 100 cub. centims. of the volumetric solution of hyposulphite of soda.] The reaction between hyposulphite of soda and iodine results in a colourless solution, containing iodide and tetrathionate of sodium.

$$\underset{248\times 2}{2\,Na_2S_2O_3.\ 5\,H_2O} + \underset{127\times 2}{I_2}$$
$$= Na_2S_4O_6 + 10\,H_2O + 2\,NaI.$$

The volumetric solution is prepared so as to contain $\frac{1}{10}$th of half this quantity in a thousand parts of the solution, and therefore

1000 cub. centims. contain 24·8 of hyposulphite and will decolorize 12·7 of iodine.

Consequently

100 cub. centims. will decolorize 1·27 of iodine.

Strictly speaking, this mode of analysis is applicable only when chlorine and bromine are absent, for if present these bodies would, according to this method, be reckoned as iodine.

Liquor Ammoniæ Fortior.—Sal-ammoniac in coarse powder is mixed with lime, and the ammonia which is evolved on heating the mixture is conducted first through two empty bottles, in which the tarry impurities of the sal-ammoniac chiefly collect, then into a proper quantity of water, which absorbs the ammonia.

$$2\,NH_3HCl + CaO\,.\,H_2O$$
$$= 2\,NH_3 + CaCl_2 + 2\,H_2O.$$

Ammoniacal gas is excessively soluble in water and also in alcohol. The B.P. solution has a specific gravity = ·891, and a fluid drachm of it contains 15·83 grains of ammonia, or upwards of 380 times its volume of the gas. [§ When diluted with four times its volume of distilled water, it does not give precipitates with solution of lime, oxalate of ammonia, sulphide of ammonium or ammonio-sulphate of copper.] These tests indicate the absence respectively of carbonate of ammonia, of chloride of calcium, of metals such as copper or zinc, and of sulphide of ammonium. [§ And when treated with an excess of nitric acid is not rendered turbid by nitrate of silver nor by chloride of barium.] The solution is thus shown to be free from chlorides and sulphates.

The liq. ammoniæ of commerce almost invariably contains small quantities of tarry matters, including various organic bases; when nearly neutralized by an acid, their odour becomes distinctly perceptible.

Liquor Antimonii Chloridi.—Black sulphide of antimony, which should be finely powdered, is boiled with strong hydrochloric acid till dissolved; the solution is then strained, and duly concentrated by evaporation.

This solution cannot be diluted with water to any great extent, as it gives a white precipitate of oxychloride.

[See Antim. Oxidum.]

The commercial article is generally coloured with pernitrate of iron. [§ One fluid drachm of it, mixed with a solution of a quarter of an ounce of tartaric acid in four fluid ounces of water, forms a clear solution, which, if treated with sulphuretted hydrogen, gives an orange precipitate, weighing, when washed and dried at 212° F., at least 22 grains.] The best mode of performing this operation consists in keeping the liquid heated to near the boiling-point in a flask whilst the gas passes through it in a rapid stream. In this way, in about a quarter of an hour, a heavy sandy precipitate forms, which can be very rapidly filtered off and washed. Conducted in this way, the process is fairly accurate.

LIQUOR ARSENICALIS et LIQUOR ARSENICI HYDROCHLORICUS.—The former is a solution of white arsenic in carbonate of potash, the latter in hydrochloric acid, both containing 4 grains to the fluid ounce. The volumetric test has been explained under ACIDUM ARSENIOSUM.

LIQUOR BISMUTHI et AMMONIÆ CITRATIS.—A solution containing citrate of bismuth and ammonia and nitrate of ammonia. Three fluid drachms, precipitated by an excess of sulphuretted hydrogen, give 9·92 grains of sulphide of bismuth, corresponding to 8·99, or practically 9 grains of oxide of bismuth. A fluid drachm therefore contains 3 grains of oxide.

THE SEEDS OF TWO SPECIES OF STRYCHNOS.

BY J. M. MAISCH.*

Last fall, I was informed that a vessel, which had arrived at the port of New York from the East Indies, had brought, as ballast, a quantity of seeds of a species of strychnos. To the kindness of Dr. Fr. Hoffmann I owe some small sample of the same, and subsequently Messrs. M'Kesson and Robbins very kindly went to the trouble of hunting up for me a few pounds of the same seeds, which, under the name of Indian gum-nuts, were offered for sale in New York, without finding a purchaser. I felt interested to ascertain whether, like the seeds of some other strychneæ, they contain strychnia. I exhibited the seeds at the Pharmaceutical Meeting in February, and showed, at the same time, from my cabinet, some seeds of *Strychnos Tieuté*, Leschenault. This plant grows in the mountainous districts of Java, and its juice is used by the Malays to prepare the poison called upas radja, or upas tieuté tjettek. The tieuté seeds are orbicular or somewhat oblong, disk-like, resembling in shape nux vomica, five-eighths to three-quarters of an inch in diameter, yellowish-grey in colour, and covered with soft, appressed hairs, having a silky lustre; the disk is rather sharp-edged, with a slightly-projecting point, indicating the hilum, and covering the somewhat club-shaped radicle of the embryo. As in nux vomica, the white horny albumen has the shape of the seed, and is composed of two disks united near the circumference, thus enclosing a hollow space, into which the cotyledons project, occupying one-quarter to one-third the diameter of the cavity. The cotyledons are broadly oval, scarcely cordate, rather acute, three- to five-nerved.

Spach † describes the tieuté seeds as follows:—Elliptic, oval or sub-orbicular, velvety, brownish (*brunâtre*), lenticular, or plano-convex; embryo projecting from the hilum, marginal, about one-third shorter than the perisperm; cotyledons heart-shaped, acuminate, nerved, foliaceous; radicle club-shaped, as long as the cotyledons. The description corresponds closely with the tieuté seeds in my possession, the colour excepted.

The so-called Indian gum-nuts are subglobose, of an appearance as if composed of two unequally-convex halves, with an elevated line surrounding the largest circumference; they are of a dirty, somewhat brownish-grey colour, with very short, closely appressed hairs; the largest diameter is three-eighths to one-half inch. A rather thin, but hard integument covers a horny albumen, which encloses, as in nux vomica, an orbicular cavity, into which the embryo reaches to about one-third the diameter. The radicle is marginal, short, cylindrical; the cotyledons are broadly oval, somewhat acuminate, and about three-nerved. Notwithstanding the horny texture of the albûmen, the seeds are readily broken in an iron mortar, but are difficult to powder; their taste is insipid, not bitter.

When the seeds are boiled with dilute muriatic acid, they become very soft, so that they are readily mashed between the fingers; the acid decoction, which is not precipitated by iodohydrargyrate of potassium, was treated with an excess of lime, the precipitate washed with cold water, dried, exhausted with boiling alcohol, and the clear filtrate evaporated; a yellowish mass was left without the slightest tendency to crystallize. It had an insipid taste, and did not show the colour reactions of either brucia or strychnia; concentrated sulphuric acid decomposed it rapidly. The seeds, therefore, contain no alkaloid.

In the East Indies, the seeds of *Strychnos potatorum*, Linn. fil. are used for clearing muddy water, under the name of tettan-kotta, or clearing-nut. Spach* describes them as greyish, suborbicular, about five lines in size. Dr. Waring † says that they are of a flattened, spherical form and yellowish-grey colour, having the testa covered with short, close hairs; albumen horny and tasteless. As far as they go, these descriptions agree with the Indian gum-nuts, which I believe to be derived from *Strychnos potatorum*, Linn. fil.

According to the Pharmacopœia of India, these seeds are also used in native practice as an emetic (Ainslie), as a remedy in diabetes (Kirkpatrick), gonorrhœa (Taleef Shereef), etc. On what principle the clearing action depends is a matter of speculation. Dr. O'Shaughnessy, at one time, thought it was due to an astringent principle, while Pereira‡ supposed it to depend on the presence of albumen and casein, and Guibourt attributes it to mucilage or pectin. The seeds are free from tannin, contain but little albumen, while, in the few experiments instituted by me, I could not ascertain the presence of casein or pectin. A considerable proportion of a peculiar mucilage is present, which does not yield a very ropy solution, and is not precipitated by alcohol, acetate of lead or sesquichloride of iron. If vegetable matter is suspended in water, the turbid liquid put into two glass vessels, and solution of this mucilage added to one, the latter liquid will settle the suspended matter in a short time, while the other remains turbid much longer.

The testa appears to offer obstructions to the absorption of water by the albumen; for, if the testa be unbroken, the seeds may be immersed in cold water for twenty-four hours, and still retain their hardness; but, if the testa is partly removed, or the seeds are broken, the albumen, after twelve hours' immersion in cold water, becomes soft enough to be readily split by the finger-nail.—*American Journal of Pharmacy.*

* Read at the Pharmaceutical Meeting of the Philadelphia College of Pharmacy, May 16.

† 'Histoire Naturelle des Végétaux.' Phanérogames, viii. 485. Paris, 1839.

* Loc. cit.

† Pharmacopœia of India, p. 146. London, 1868.

‡ Pharm. Journ. and Trans., ix. 478. 1850.

THE MEDICINAL PROPERTIES OF THE COCOA-NUT.

BY JOHN R. JACKSON, A.L.S.,

Curator of the Museums, Royal Gardens, Kew.

The cocoa-nut (*Cocos nucifera*, L.) is a well-known economic plant, and is extensively cultivated in tropical countries. It is estimated that in Travancore alone there are ten million of these trees growing. The fruits are a most important article of food in the countries where they grow, while the oil and the fibre of the husk—known as coir—are valuable articles in British commerce.

The cocoa-nut is not a recognized medicinal plant in European practice, though the oleine obtained by pressure from the crude oil and refined, has been used as a substitute for cod-liver oil, experiments having shown that its effect in increasing the weight of the body is almost equal to that of the latter, but that its continued use is apt to disturb the digestive organs and produce diarrhœa. The crude oil, as brought into England, is obtained by boiling and pressing the white kernel or albumen. While in a fresh state, and in a liquid form, this oil is of a pale yellow colour, and almost without smell; it is much used in cookery by the natives, but becomes partially solid and turns rancid before it arrives in this country, where, for the purposes of the candle-maker, the stearine or solid fat is separated from the fluid. Cocoa-nut oil is said to be useful in strengthening the growth of the hair.

The milk of the cocoa-nut is more important to the natives in a medicinal point of view than the oil; in India they use it as a purifier of the blood, and we have heard from many an English resident in our eastern possessions, that it is not only an excellent medicine for the purpose, but that nothing can possibly be more refreshing to a thirsty traveller under a tropical sun than a good draught of fresh cocoa-nut milk. As we obtain it in this country, it has not only lost its freshness and fine flavour, but has also lost its medicinal properties. When quite fresh it has been employed successfully by English doctors in India in cases of debility and incipient phthisis, and it also forms an excellent substitute for, if indeed it is not preferable to, cow's milk for tea and coffee. In large doses, however, it is said to act as a purgative, and on this account has been recommended in lieu of castor oil for those who cannot overcome the nausea arising from the latter. In the Fiji islands the milk is very extensively used, but it has been supposed, with how much truth we are not able to say, that the continued use of it predisposes to the dropsical complaints which are said to prevail in those islands.

The toddy or wine which is obtained from the flower-spikes is described as being very refreshing and delicious, taken before sunrise; it is given by the native doctors in cases of consumption, and if taken regularly is said to be an excellent medicine for delicate persons suffering from habitual constipation.

FLUID EXTRACTS AND THEIR MENSTRUA.

BY EDWARD R. SQUIBB, M.D.

(*Continued from page* 6.)

The following table, embracing the substances of nine officinal fluid extracts, and one other, is limited in extent by the size of the page, but is large enough to illustrate these points. These percolations, excepting ergot and lupulin, were all made with fine powders, moistened with more menstruum than is directed by the Pharmacopœia,

TABLE OF PERCOLATIONS.

	Portion of the Percolate.	Aconite Root.		Buchu Leaf.		Cinchona Bark.		Ergot.		Lupulin.		Wild Cherry Bark.		Sarsaparilla Root.		Senna Leaf.		Dandelion Root.		Uva Ursi Leaf.	
		Grains.		Grains.		Grains.		Grains.		Grains.		Grains.		Grains.		Grains.		Grains.		Grains.	
	Pints.	Difference.	Extract.	Difference.	Extract.	Difference.	Extract.	Difference.	Extract.	Difference.	Extract.	Difference.	Extract.	Difference.	Extract.	Difference.	Extract.	Difference.	Extract.	Difference.	Extract.
	1	288	512	305	789	398	514	304	748	705	2275	287	344	325	829	563	1166	808	1927	633	1344
	2	193	343	124	321	155	200	135	332	480	1549	117	140	137	349	286	593	374	892	213	452
	3	118	210	67	173	70	90	49	121	187	604	73	87	53	135	103	213	169	403	173	367
	4	77	137	44	114	48	62	26	64	133	429	66	79	40	102	46	95	119	284	73	155
	5	57	101	27	70	53	68	21	52	77	249	60	72	40	102	47	98	53	126	73	155
	6	50	89	20	52	26	34	16	39	64	207	60	72	40	102	36	75	31	74	35	74
	7	36	64	20	52	28	35	13	32	39	126	54	65	40	102	34	71	8	19	36	77
	8	41	73	19	49	65	84	17	4[illegible]	26	84	62	74	40	102	33	68	7	17	27	58
	9	44	78	18	47	95	123	14	34	23	74	55	66	34	87	31	64			20	42
	10	34	61	18	47	71	92	9	22	13	42	53	6[illegible]	20	51	18	37			16	34
	11	31	55	12	31	31	40	8	19	13	42	53	63	12	31	23	48				
	12	37	66	9	22	30	39	10	25			68	81			2	4				
	13	29	59	1	3	26	34	10	25			57	68			4	8				
	14	27	48			14	18					52	62								
	15	22	39			32	41					49	59								
	16	20	30			25	32					41	50								
	17					38	49														
Sum Total . . .		1104	1964	684	1770	1205	1555	632	.555	1760	5681	1207	1445	781	1992	1226	2540	1569	3742	1299	2758
Quantity of powder percolated . . .		7652		7680		7680		7680		7680		7680		7680		7680		7680		7680	
Dried residue from percolation . . .		5688		5910		6125		6125		1999		6235		5688		5140		3938		4922	
Loss by percolation (solid extract) . .		1964		1770		1555		1555		5681		1445		1992		2540		3742		2758	
Pharmacopœia percolates to				2¾ pints.		4 pints.		3¾ pints.		2 pints.		3 pints.		4 pints.		3 pints.		3 pints.		3 pints.	
Maximum ext. obtained by Pharm. .				1240		866		1249		3824		571		1415		1972		3222		2163	
Percentage of total ,, ,, . .				70 p. c.		55 p. c.		80 p. c.		68 p. c.		40 p. c.		71 p. c.		78 p. c.		86 p. c.		78 p. c.	
Percolate required to get 80 per cent. of total extract		8½ pints.		4¼ pints.		9¼ pints.		4 pints.		3½ pints.		11 pints.		6 pints.		4 pints.		2½ pints.		3½ pints.	
Extract in the pint when of 80 per cent.		1571		1416		1244		1244		4544		1156		1593		2032		2993		2206	

and the moistened powder put through a sieve of about twelve meshes to the inch before the packing. The packing and percolating was then done with all the care and skill which the writer's experience could suggest, so that the results are considered to be much better than an average practice would give. Each pint of percolate was weighed in a flask marked in the narrow part of the neck, and the menstruum at the same temperature was weighed in the same flask, and the difference in weight set down in the column under that heading. The same powder, managed in the same way, was percolated at once; and another portion, after macerating four days, with no practical difference in result; whilst a maceration of twenty-four hours after the third or fourth pint of percolate had passed, would always increase the difference somewhat, and would often increase them much. Changes of temperature, also, by changing the solvent power of the menstruum, caused the differences to rise and fall somewhat, coincident with changes of weather. A simple inspection of the proportion of the extract contained in the first pint of each percolate will probably expose the fallacy that any amount of expert skill and management could ever make that pint represent the whole efficacy of the drug. In percolating the powder of good aconite root by a very slow and careful percolation, the characteristic numbing impression upon the tongue was distinctly though faintly perceptible by the application of a few drops from the thirteenth pint. The bitterness of cinchona was perceptible in the seventeenth pint; but neither the taste nor odour of wild cherry bark were perceptible in the sixteenth pint, though the amount of extract contained was large. Ergot was necessarily percolated in coarse powder (No. 60), and was easily and rapidly exhausted; but the dried residue powdered finer gave a notable proportion of extract, which, for want of time, was not determined. Not so with lupulin, however, which, percolated in its natural condition of coarse powder, left a light residue, from which no ordinary management could extract anything more. The percolation of lupulin was very regular and uniform, and maceration at any stage of the process had no perceptible effect. Effective percolations of dandelion-root are very slow, and therefore very perfect; and like those of sarsaparilla, often become slower as they approach completion.

The great difference in the rate of exhaustion in the examples given in the table indicates that no general rule of limit can be adopted, but that each substance must be studied by itself. From results given in a previous paper, the solid extract obtained by percolation from some drugs, and probably from all, is not of uniform medicinal value as found in different parts of the percolate, but becomes weaker towards the end. When this ceases to be of practical value, or, in other words, where the percolation should terminate, was not determined. Among the examples given it will be seen that if the Pharmacopœia used fine powder and slow percolation, it would, in the case of dandelion, obtain 86 per cent. of the total extract; and it is probable that this is somewhere near or beyond the limit of practical utility. If so, it might be directed that fluid extracts as a class of preparations should not contain less than 80 per cent. of the total solid extract which the drugs were capable of yielding to the given menstruum; and the limit of percolation necessary to obtain this is shown by one of the lines of the table. But where this 80 per cent. of the solid extract has been obtained, it is not within the compass of a pint, but is contained in a number of pints, never less than 2½ nor more than 11.

To get these various large quantities within the measure of a pint each without the use of heat, and with the least loss of menstruum, is the next and great requisite, without which they are not fluid extracts.

To accomplish this, there appears to be no choice of means. There is one way, and only one way, known to the writer by which it may be done, and that is by repercolation, or percolating fresh portions of the drug with percolate from previous portions, until the normal difference in weight between equal volumes of the menstruum and percolate is attained.

This process is somewhat complex and troublesome, and requires knowledge and skill; and, worse than all, requires that a stock of weak percolate of different densities be carried from one making to the next for each fluid extract. But, as it appears to be absolutely the only means of accomplishing the end well and properly, there is no choice between it and those means which give results too imperfect for the present state of pharmacy.

(*To be continued.*)

GLYCERINE; ITS QUALITY AS IT EXISTS IN COMMERCE.

BY JOSEPH P. REMINGTON, PHILADELPHIA.

This powerful solvent and useful medicine, though but lately called from its seclusion in the cabinet in answer to the demands of this progressive age, has rapidly ingratiated itself into the esteem of the chemist, pharmacist, and the public at large.

It continues to widen its sphere of usefulness; we hear of new applications constantly; and its *bland manners* and *insinuating disposition* have won for it a host of friends, and an ever-increasing popularity.

It serves its mission as faithfully on the dressing-table of a lady as it does in our gas meters; as well as an excipient for pill-masses as it does as a substitute for molasses in printers' rollers, and its range of applications between these extremes is varied and extensive.

Its production, with a view to improve the quality and lower the price, has been attended with success, as we all know. A glycerine which will answer almost every purpose (except for internal administration), can be procured for twenty-five cents per pound; and one fit for any purpose for sixty cents per pound.

One of the principal reasons for bringing this matter forward, is to detail a comparative examination of the different brands in the market, which examination was at first undertaken for the writer's own satisfaction, but which may prove not uninteresting to the Association.

Brands.	For Strength. Sp. Gr.	Colour.	Odour when warm.	Nitrate of Silver.
1	1·253	None.	None.	No precip.
2	1·240	Yellowish.	Fatty.	Heavy wh. prc.
3	1·250	Yellowish.	Slight.	Rose colour.
4	1·254	None.	Empyreumatic.	No precip.
5	1·250	Quite dark.	Like glue.	White precip.
6	1·245	None.	Slight.	Rose colour.

Brands.	Sulphuric Acid.	For Sulphate of Lime.	For Lime Salts Ox. Ammon.	Ferrocyanide of Iron.
1	Slightly discol.	No precip.	No precipitate.	Opalescence.
2	Discoloured.	No precip.	Slight precip.	Clear.
3	Discoloured.	No precip.	No precipitate.	Opalescence.
4	Discoloured.	No precip.	No precipitate.	Precipitate.
5	Slightly discol.	No precip.	White precip.	Slight precip.
6	Discoloured.	No precip.	No precipitate.	No precip.

Brands.	Hydro-sulph. of Ammon.	Chloride of Barium.	For Ethyl-Butyrate.	For Sugar.
1	No precip.	No precip.	Slight odour.	Free fr. sugar.
2	No precip.	Slight precip.	Strong odour.	Free fr. sugar.
3	No precip.	Precipitate.	Slight odour.	Free fr. sugar.
4	No precip.	No precip.	Veryslight odour	Free fr. sugar.
5	No precip.	Opalescent.	Slight odour.	Free fr. sugar.
6	Slight precip.	No precip.	Slight odour.	Free fr. sugar.

Each glycerine was tested by the same reagent, in the same relative quantity, at the same time; and the effect carefully noted.

The glycerines, as they stood in their commercial attire before the examination, presented quite a contrast; the most pretentious was one of the latest comers into the market, No. 6; which, from the size of the bottle, would lead to the supposition that it contained more than a pound. This glycerine has attracted attention by reason of the free use of adjectives on the label, and on account of a vigorous attack on the propriety of using adjectives by the editor of a trade journal.

No. 5 is put up in a very attractive style, the blue stencilled label and the refractive property of the glycerine contrast to very good advantage.

The American glycerines were in a plainer and neater dress, Nos. 1, 2 and 3 being put up in the usual glycerine bottle with a plain label.

The result will be found in the foregoing table.—*Proceed. of American Pharm. Assoc.*, 1870.

SUPPOSITORIES.

AN INAUGURAL ESSAY, BY F. M. GOODMAN.

The etymology of the word suppository conveys at once an idea of the use of the class of pharmacal preparations to which it is applied. It is derived from suppositorius —"underneath"; called also hypotheton, from *hypo* "under," and *tithemi*, "to place;" and sometimes balanus (*balanos*), an "acorn," in reference to the shape, that of a sphere or an oblong body; these were intended for rectal use only.

As it became evident that medicines applied to the mucous membranes of the vagina or rectum had the same systemic effect as when taken into the stomach, and that, being so applied, they were less repulsive to the patient, advantage was soon taken of this form of administration. It then became necessary to distinguish between rectal and vaginal suppositories, consequently the former were called *suppositorium*, and the latter *suppositorium uterinum*, which were the medicated pessaries of the ancients, and are still frequently prescribed as pessaries; in fact, medicines applied to *any* of the mucous membranes were called suppositories—what is now termed a lozenge or troche, was formerly known as a suppository, or bacilla, the latter signifying "a stick."

From this method of treatment arose the custom, though not as yet very prevalent, of applying medicines in the solid form to the urethra, in the treatment of urethritis, etc.

It is only within the last decade that this method of medication has reached a state approaching to perfection, but it is now such an important feature that it is almost of daily occurrence to dispense suppositories, though we have no officinal directions for their preparation. To those unaccustomed to dispensing suppositories, their preparation often proves a difficult task, but by experience one may become so expert as to make a dozen within fifteen or twenty minutes, so that a patient is not called upon to wait longer for suppositories than for a dozen pills or powders.

MOULDS.—These are in great variety, but the most common are conical-shaped, and made of block tin; they are of two sizes, the vaginal and rectal; the former making a suppository weighing 2 drachms, and the latter one of 35 grains. It is customary for pharmacists to have these two sizes, but if an intermediate size were furnished, such as would mould suppositories weighing 1 drachm each, the latter size would satisfy the majority of physicians better than those now dispensed. It is complained that the large are *too* large, and the small are *too small*, but if of the size above indicated, they could be used as vaginal or rectal, in most cases.

In using these moulds a tray is necessary, which may be constructed in the following simple manner: For one dozen vaginal moulds, purchase a tin pan about 7 or 8 inches in diameter and 4 inches in depth; have a sheet of tin cut to fit the pan about half an inch from the top, perforate the tin with holes sufficiently large to allow of the ready admission and removal of the moulds; of course, the rectal moulds will require a smaller pan, or the same pan and a sheet of tin with smaller holes.

If the inside of these moulds be examined, there will be observed a great number of annulations made by the instrument used in turning the model from which they were cast, but by polishing, these rings may be worn off, when the inside becomes very smooth. It is on this account that suppositories are best made in old moulds.

A very nice mould, called Weigand's, invented by Mr. T. S. Weigand, of Philadelphia, is made on the principle of the ordinary bullet mould: two parallel bars of brass, with the proper cavities in each, are hinged at one extremity, and have handles at the other; these moulds, when in use, are kept closed by slipping a ring, made for the purpose, over the handles.

They are made for six, nine, or twelve suppositories, which weigh about 40 grains each.

It has been asserted that these moulds are worthless, cracking the suppository in two, when opened, even when lycopodium, arrowroot, or other substance has been used to prevent adhesion. The writer has used these moulds a great deal, and has found the only and a *sure* way of making a perfect suppository is to have the moulds *thoroughly refrigerated, and their surfaces well polished;* when the latter requisite is once attained, it can be easily preserved by rubbing whiting with a piece of chamois skin into the moulds each time, before putting them away, and wiping with the chamois before using. Wiegand's moulds may be refrigerated very perfectly without the use of ice, in the following manner:—Close them, and place the handles in the spout of a hydrant, allowing the orifices of the moulds to be downward; place a box in the sink on which to rest the lower end, and set the water running gently over the moulds, before beginning to melt the ingredients; when wanted, wipe them quickly and fill; then set them into a shallow vessel containing water, and when a pellicle has formed on the surface of each suppository, replace the moulds under the hydrant. Some object to this method, saying that the water in passing over the suppositories dissolves out some of their soluble ingredients; but this cannot be considered an objection, for the moulds are very seldom or *never* filled exactly full, but a little too much is poured into each; and when they are cold enough to be removed, the superfluous material is scraped or trimmed off with a spatula, before the opening of the moulds. In doing this, the portion that has been exposed to the influence of the water is removed.

Moulds are also made of paper, by having a piece of wood about six inches long, one end of which is formed into the shape of a suppository, which must be perfectly conical, and *not* like the ordinary suppository, which is more or less *rounded* at the apex; for if it be rounded in the least, it is impossible to wrap the stiff paper around it so as to make a neat-looking mould.

The paper for this purpose may be thick writing-paper; tinfoil is also sometimes used, and answers the purpose very well. When in use, these moulds are held in an upright position by placing them in round holes bored through a thin board, or by standing in a vessel filled with flax-seed, or other suitable substance.

The urethral mould, or syringe, as it is commonly called, is simply a glass or hard rubber tube, three or four inches in length, having a piston fitted to it. The calibre of these moulds is sufficiently large to make a suppository about an eighth or three-sixteenths of an inch in diameter, which is to be an inch and a half or two inches long, and to weigh from 7 to 14 grains. In using these moulds, two lengths are moulded at once, and the piece in then cut in the centre. An ordinary funnel-tube answers the purpose of a mould admirably, for if such a tube be used, say twelve inches long, it can be graduated by scratching with a file, into two-inch spaces.

In the suppository syringe the piston is a rod of glass, with cotton wrapped around it at about *half an inch from the end*, and this uncovered portion of the rod disfigures the end of the suppository when any pressure is used in expelling it. For this reason the funnel-tube is preferable, for the piston being of wood can be cut, and wrapped close to the end, which may be made of the same diameter as the suppository, so as not to mar it.

VEHICLE.—That recommended by the British Pharmacopœia is composed of equal parts of prepared lard and white wax, but this is a very poor vehicle; among the objections to it is, that pharmacists *very seldom or never* render or prepare lard for their own use, and consequently rely upon the integrity of the packers, or butchers; now it is well known that commercial lard is impure—that the renderers frequently stir in water, and occasionally a solution of sulphate of copper or of alum, salt, etc., to whiten it; of course the lard is thereby rendered unfit for pharmacal uses.

The vehicle of the B.P. is objectionable also as regards its melting-point, which is 104° F. (40° C.), or much above the temperature of the human body.

The substance most usually employed for the purpose in the United States, is a mixture of cocoa butter and spermaceti, in the proportion of four-fifths of the former to one-fifth of the latter, in summer, and five-sixths to one-sixth in winter; the above proportions will answer also for cocoa butter and white wax. These mixtures become soft at 79° F. (26·1° C.), and 82° F. (27·7° C.), respectively, and consequently readily melt at the temperature of the body, in this respect answering an essential requirement of suitable vehicles, and as such they are generally employed.

But why should these substances be used when in sevum or suet we have a material that answers all the requirements of a good vehicle? Suet has about the same *softening*-point, 80° F. (27·6° C.), and is doubtless superior to the above mixtures in this: that it sets or cools much more readily. This constitutes quite an advantage, while the expense of the material is only about *one-sixth* that of the former. To prepare it, take the kidney suet of *Ovis Aries*, and purify as directed in the Dispensatory, by cutting into small pieces and melting over a moderate heat, and straining through linen. According to the Dispensatory, suet is inodorous, but practically it is never free from an odour, which is rather disagreeable, but which may be overcome by the addition of a small quantity of an essential oil to the cooling mass. For this purpose I use a mixture of the oils of lavender and sassafras in equal parts; about two or four minims to the troy ounce is sufficient. This addition not only destroys the odour, but acts as a preservative, and prevents the suet from becoming rancid as soon as it otherwise would; a solution of benzoin is also very good for this purpose. After the oils or benzoin have been added, the melted fat should be poured into cold, shallow vessels, such as the covers of earthenware jars, in order to get it in sheets resembling white wax. Prepared in this manner it will keep a considerable length of time—usually as long as is required,—and the stock can at any time be renewed.

Suet is capable of absorbing about 1 fluid drachm of water to the troy ounce, so that it is easy to combine with it a concentrated mucilage of elm (which also acts as a preservative), or an aqueous solution of an extract, or of salts of various kinds. Some object to adding water to suppositories, as it promotes rancidity, but this is not a very serious objection, for finished suppositories are not required to be long kept. Water has the same effect upon cocoa butter as upon suet or lard. These bodies if exposed to the air absorb oxygen, and become quite acid; the fatty acids are naturally in combination with glyceryle, but they will not combine with the hydrate of that base, and the presence of water accelerates the decomposition of fats, inasmuch as it supplies all that is necessary—in connection with the absorption of oxygen—to form a hydrate of the oxide of the radical glyceryle, $C_6H_5O_3 + 3HO$, or glycerine, with the elimination of fatty acids. The fluids thus set free, separate from the concrete matter, and as a consequence rancid fats have the appearance of a mixture of a solid granular substance and a fluid. These fatty acids produce the irritating properties possessed by rancid fats.

In former times soap was frequently employed for suppositories, but is seldom used at present.

(*To be continued.*)

DUST AND SMOKE.

(*Continued from page* 5.)

Let me now state in two sentences the grounds relied upon by the supporters of the germ-theory of contagion. From their respective viruses you may plant typhoid fever, scarlatina, or smallpox. What is the crop that arises from this husbandry? As surely as a thistle rises from a thistle seed, as surely as the fig comes from the fig, the grape from the grape, the thorn from the thorn, so surely does the typhoid virus increase and multiply into typhoid fever, the scarlatina virus into scarlatina, the small-pox virus into small-pox. What is the conclusion that suggests itself here? It is this:—That the thing which we vaguely call a virus is to all intents and purposes a *seed;* that in the whole range of chemical science you cannot point to an action which illustrates this perfect parallelism with the phenomena of life—this demonstrated power of self-multiplication and reproduction. There is, therefore, no hypothesis to account for the phenomena but that which refers them to parasitic life.

And here you see the bearing of the doctrine of Spontaneous Generation upon the question. For if the doctrine continues to be discredited as it has hitherto been, it will follow that the epidemics which spread havoc amongst us from time to time are not spontaneously generated, but that they arise from an ancestral stock whose habitat is the human body itself. It is not on bad air or foul drains that the attention of the physician will primarily be fixed, but upon diseased germs which no bad air or foul drains can create, but which may be pushed by foul air into virulent energy of reproduction. You may think I am treading on dangerous ground, that I am putting forth views that may interfere with salutary practice. No such thing. If you wish to learn the impotence of medical science and practice in dealing with contagious diseases, you have only to refer to a recent Harveian oration by Dr. Gull. Such diseases defy the physician. They must burn themselves out. And, indeed, this, though I do not specially insist upon it, would favour the idea of their vital origin. For if the seeds of contagious disease be themselves living things, it will be difficult to destroy either them or their progeny without involving their living habitat in the same destruction.

And I would also ask you to be cautious in accepting the statement which has been so often made, and which is sure to be repeated, that I am quitting my own *métier* when I speak of these things. I am not dealing with professional questions. I am writing no prescription, nor should I venture to draw any conclusion from the condition of your pulse and tongue. I am dealing with a question on which minds accustomed to weigh the value of experimental evidence are alone competent to decide, and regarding which, in its present condition, minds so trained are as capable of forming an opinion as on the phenomena of magnetism and radiant heat. I cannot better conclude this portion of my story than by reading to you an extract from a letter addressed to me some time ago by Dr. William Budd, of Clifton, to whose insight and energy the town of Bristol owes so much in the way of sanitary improvement.

"As to the germ theory itself," writes Dr. Budd, "that is a matter on which I have long since made up my mind. From the day when I first began to think of these subjects, I have never had a doubt that the specific cause of contagious fevers must be living organisms.

"It is impossible, in fact, to make any statement bearing upon the essence or distinctive characters of these fevers, without using terms which are of all others *the most distinctive of life*. Take up the writings of the most violent opponent of the germ theory, and, ten to one, you will find them full of such terms as 'propagation,' 'self-propagation,' 'reproduction,' 'self-multiplication,' and so on. Try as he may—if he has anything to say of those diseases which is characteristic of them—he cannot evade the use of these terms, or the exact equivalents to them. While perfectly applicable to living things, these terms express qualities which are not only inapplicable to common chemical agents, but as far as I can see actually inconceivable of them."

Once then, established within the body, this evil form of life, if you will allow me to call it so, must run its course. Medicine as yet is powerless to arrest its progress, and the great point to be aimed at is to prevent its access to the body. It was with this thought in my mind that I ventured to recommend, more than a year ago, the use of cotton-wool respirators in infectious places. I would here repeat my belief in their efficacy if properly constructed. But I do not wish to prejudice the use of these respirators in the minds of its opponents by connecting them indissolubly with the germ theory. There are too many trades in England where life is shortened and rendered miserable by the introduction of matters into the lungs which might be kept out of them. Dr. Greenhow has shown the stony grit deposited in the lungs of stonecutters. The black lung of colliers is another case in point. In fact, a hundred obvious cases might be cited, and others that are not obvious might be added to them. We should not, for example, think that printing implied labours where the use of cotton-wool respirators might come into play; but I am told that the dust arising from the sorting of the type is very destructive of health. I went some time ago into a manufactory in one of our large towns, where iron vessels are enamelled by coating them with a mineral powder, and subjecting them to a heat sufficient to fuse the powder. The organization of the establishment was excellent, and one thing only was needed to make it faultless. In a large room a number of women were engaged covering the vessels. The air was laden with the fine dust, and their faces appeared as white and bloodless as the powder with which they worked. By the use of cotton-wool respirators these women might be caused to breathe air more free from suspended matters than that of the open street. Over a year ago I was written to by a Lancashire seedsman, who stated that during the seed season of each year his men suffered horribly from irritation and fever, so that many of them left his service. He asked me could I help him, and I gave him my advice. At the conclusion of the season this year he wrote to me that he had simply folded a little cotton-wool in muslin, and tied it in front of the mouth; that he had passed through the season in comfort and without a single complaint from one of his men.

The substance has also been turned to other uses. An invalid tells me that at night he places a little of the wool before his mouth, slightly moistening it to make it adhere; that he has thereby prolonged his sleep, abated the irritation of his throat, and greatly mitigated a hacking cough from which he had long suffered. In fact, there is no doubt that this substance is capable of manifold useful applications. An objection was urged against the use of it: that it became wet and heated by the breath. While I was casting about for a remedy for this, a friend forwarded to me from Newcastle a form of respirator invented by Mr. Carrick, an hotel-keeper at Glasgow, which meets the case effectually, and, by a slight modification, may be caused to meet it perfectly. The respirator consists of a space under a partition of wire-gauze, intended by Mr. Garrick for "medicated substances," and which may be filled with cotton-wool. The mouth is placed against the aperture, which fits closely round the lips, and the air enters the mouth through the cotton-wool, by a light valve, which is lifted by the act of inhalation. During exhalation this valve closes; another breath escapes by a second valve, into the open air. The wool is thus kept dry and cool; the air in passing through it being filtered of everything it holds in suspension.*

(*To be continued.*)

IMPROVED DOVER'S POWDER.

BY B. D. KEATOR, M.D.

A very convenient and useful compound is Dover's Powder; but, unfortunately, a very *nauseous* one. I have for several years past had it under consideration, making various changes in its composition; but until recently with poor success. The diaphoretic powder of Dr. Tully, and also that lately recommended by Dr. Brinsmade, I have found on trial to be good *anodynes*, but far inferior in *diaphoretic* effect to the old Dover. The ipecacuanha cannot be dispensed with, but I think the opium and sulphate of potash (the main nauseants) *can* be replaced with better ingredients. Ipecacuanha, in doses under half a grain is anti-emetic, and "not guilty" in the nauseous taste of Dover.

Out of Dover's, Tully's and Brinsmade's powders I have compounded a *fourth*, which I believe contains the excellences of *all*. There is 1 gr. of ipecacuanha, and one-sixth gr. sulph. morphia (equal to 1 gr. opium) to every 10 grs. of the mixture. The camphor adds much to it as an anodyne; the chalk is anti-acid, and necessary to hold the camphor in pulverized form; and the liquorice, besides disguising the taste of the rest, is of itself useful as a demulcent, expectorant, etc. I can confidently recommend this to my brethren of the profession who choose to give it a trial, as *superior to the old Dover's powder in every respect*.

℞ Sulph. Morphiæ gr. x
Pulv. Camph. ʒiij
,, Ipecacuan. ʒj
Cretæ Præparat. ʒiij
Pulv. Glycyrrh. ʒiij.

Thoroughly mix. Dose same as Dover (in water).

—*Pharmacist*, *from Tolono, Ill., Medical Gazette.*

Milk an Antidote to Poisoning by Nitrate of Silver.—Mr. Ernest Hart, in a recent number of the *British Medical Journal*, relates that while house-surgeon at St. Mark's Hospital, a piece of nitrate of silver, with which he was painting the fauces of a child, broke, and the larger part of the caustic stick was swallowed. He produced immediate vomiting by forcing his fingers on to the gullet, and having obtained a large supply of milk, pumped several pints into the child's stomach and out again. The child had dysenteric symptoms during the next three days and occasional vomiting, but was kept on milk diet and recovered. Milk acts as an antidote to nitrate of silver in virtue of its large proportion of suspended albumen. Mr. Hart uses it in lieu of salt and water for neutralizing the excessive effects of even the mitigated caustic, when employing it locally on the mucous membrane of the eyelids.

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* Mr. Ladd, of Beak Street, sells these respirators.

The Pharmaceutical Journal.

SATURDAY, JULY 8, 1871.

Communications for this Journal, and books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

ACCIDENTAL POISONING.

THE cases reported in the present and preceding numbers of this Journal opportunely illustrate some of the sources of danger attending the keeping and dispensing of poisons. These cases are also of special interest while this Society is engaged in opposing "the regulation of pharmacy" which is proposed in shape of the Pharmacy Act Amendment Bill now before the House of Commons.

In the first place, the death of the two children from the effects of a poisonous dose of opium administered by mistake, affords striking support to the argument that regulations as to the keeping and dispensing of poisons—if they be imposed at all—ought to be imposed so as to affect all classes of persons who dispense medicine. We apprehend the force of that argument must be apparent to every one who considers the subject even cursorily. For what is the object to be gained by regulation? Protection from poisoning by the accidental substitution of one drug for another. It is as a measure for ensuring public safety that these regulations are proposed to be made compulsory; and, considering the matter from that point of view, it seems impossible to conceive why medical dispensers should be exempted from the obligation of conforming to any regulations prescribed as to the keeping and dispensing of poisons. We here purposely leave aside the purely pharmaceutical question, whether or not there be any need for pharmacists to be subjected to compulsory regulation, for that is a question of comparatively less importance than that affecting the whole community; and even admitting that there be, on the part of the public, a demand for protection against accidental poisoning, we cannot imagine any one being less unwilling to be poisoned by a medical man than by a pharmacist.

We are glad to see this view of the case fully adopted by at least one of the medical papers in the statement that—

> ". . . . no protection against poisoning can be complete or satisfactory, which does not include medical dispensers. The risk of accident would appear, *primâ facie*, to be even greater in their case than in that of pharmacists, inasmuch as their functions and attention are not solely given to the making up of medicines."

In a subsequent number, also, the same paper speaks of the above-mentioned fatal case of poisoning as being "but another instance of the abominable way poisons are stored in apothecaries' shops." Numerous correspondents in this Journal have pointed to the same fact; and certainly the evidence given by "Mr. JOHN LEVYGILL, the apothecary at the dispensary," seems to afford ample ground for the remark, and for the opinion that in medical Dispensaries the possible substitution of poison for physic is neither efficiently provided against nor regarded with sufficient seriousness.

It is probably from a sense of these deficiencies that the Parliamentary Committee of the British Medical Association in considering the Pharmacy Act Amendment Bill, resolved—

> "That it is desirable that provision should be made for the carrying out the regulation for keeping, dispensing and selling poisons, and that for this purpose a clause should be introduced providing inspectors to ascertain that they are carried out."

We understand that the view we have here put forward is favourably entertained by the Privy Council, and that Mr. FORSTER is now disposed to introduce into the Bill amendments that would give it the more extended application to all dispensers of medicine.

Contrasting strongly with the state of things illustrated by the case referred to is the caution evidenced, as regards the sale of a dangerous drug, by a pharmaceutical chemist in the other fatal case of poisoning reported this week. It would perhaps be difficult to have done anything more for "public safety" than was done in that case, for the too frequent practice of amateur doctoring is a source of danger that would override even the most stringent compulsory regulations.

Another point illustrated by the Dispensary case is the vagueness of the Poison Schedule of the Act of 1868, and the difference of opinion as to what is to be regarded a poison within the meaning of the Act. Kino powder is a preparation of opium, and, though it contains a larger amount of opium than paregoric does, there is still a possibility that either might poison. It seems, therefore, that the exercise of judgment and caution by the competent vendor or dispenser of drugs is, after all, the safest protection against accidental poisoning. The granting of a monopoly of the business of pharmacy to such competent men was indeed a measure mainly taken in the interests of the public; and, though it has, no doubt, been the means of improving that business for its followers, there is nothing to justify the taunting tone in which the "monopoly" enjoyed by the Pharmaceutical Society is often spoken of in some of the medical journals. Rescinding that monopoly is surely an inconsistent suggestion from those who study the protection of the public from accidental poisoning, and who maintain this to have been the "public advantage" for the sake of which the "monopoly" was granted.

In the foregoing remarks we have considered accidental poisoning more especially as a subject of general interest than as one specially affecting pharmacists, because "public safety" is the reason urged in favour of the proposed regulations.

The contention for regulations on that ground does away with the objection we once incidentally made to the argument, that the regulations should not be made compulsory, because medical men would be exempt from that compulsion. We believe that argument to be fallacious as regards the narrower question, whether regulations should be made compulsory for pharmacists, for if regulations are to be contended against from that point of view, we should prefer to see it done on the more rational ground that—as regards pharmacy—they are not necessary. But whenever the imposition of poison regulations comes to be treated as a measure of public safety, it is no longer a mere question concerning pharmacy, and regard must be had to all sources of danger—medical as well as pharmaceutical.

It might have been supposed that, after all the discussion on poison regulations, the real points at issue would be understood; but that is not the case, and it was with no small surprise we recently read the statement that one of the two things evident from the interview with the Vice-President of the Privy Council was, that that body conceived it "to be a duty devolving on them to insist on the necessity of poisons being *sold under certain well-defined regulations*." The italics are ours, and they serve to show what strange misconceptions are possible. Surely it is not now necessary for the Privy Council or the trade, or even the public, to be told either that poisons are legally sold under certain well-defined regulations, or that there is no question at issue respecting the sale of poisons under the Pharmacy Act of 1868.

There are no doubt several questions still to be be considered as to the illegal sale of poisons, interesting and important to both the public and pharmacists, and to these we hope soon to have an opportunity of referring. At present, however, there is no moot point concerning the sale of poison, and since it is always desirable during a period of conflict to have the points at issue clearly defined, it may not be superfluous to say that the disputed question is one solely as to the *keeping and dispensing of poisons*,—in other words, whether regulations require to be made compulsory on pharmacists, and whether they are to be the only persons subjected to penal restrictions in this respect.

Postscript, *Friday Evening*.—In consideration of the interest that must be felt as to the proceedings in Parliament when the second reading of the Pharmacy Bill came on, it has been deemed proper to postpone the issue of the Journal sufficiently to admit of a report being published. This will be found at page 34.

We are also enabled by this delay to state that certain amendments which Mr. Forster expressed his willingness to introduce into the Bill, were submitted confidentially to the Council at its last meeting, and that after prolonged consideration the Council resolved, by a majority, that the suggested amendments did not permit the withdrawal of opposition to the Bill. This had been communicated to the Right Honourable Mr. Forster and to Mr. W. M. Torrens, M.P., who had given notice to move that the Bill be read a second time three months hence, and when the Bill came before the House at 1.15 this morning, Mr. Torrens proposed that for convenience, and in consideration of the altered views of the Government, the second reading of the amended Bill should be taken then on condition of Mr. Forster consenting that the discussion on the merits of the Bill should be deferred until it was in Committee. This course was objected to by the House on principle, and at the suggestion of Sir H. J. Selwin-Ibbetson, it was agreed that the amendments introduced by the Government should be placed on the paper so as to afford opportunity of their being circulated throughout the country and considered by those interested. We are consequently enabled to publish the Bill in its amended form. (See page 35.)

Referring to our previous remarks as to the object of the original Bill, it seems desirable to point out that the misconception on this head appears to be more general than we had supposed when those remarks were written; for Dr. Dalrymple, in expressing his regret at finding such a strong opposition to the Bill, singularly enough stated that the principle involved in the Bill being read a second time was that *a right existed to put certain restrictions on the sale of poisons*. In point of fact, however, restriction of the *sale* of poisons was not the main object of the original Bill. Neither would the amended Bill affect the sale of poisons otherwise than by extending the provisions of the Pharmacy Act of 1868 to surgeons keeping open shops for the sale of poisons, and thus placing them, in this respect, on the same footing as druggists, who have been for nearly three years subject to a law specifically regulating the sale of poisons.

The circumstance here referred to is alone sufficient to show the need of time for the due consideration of the proposed measure, and we venture to hope the attitude of Mr. Forster, who has charge of this measure, may be taken as an earnest that the ultimate result may be satisfactory to all parties.

In any case his introduction of amendments, with the object of meeting objections to the Bill by druggists, would seem to show there is little fear of a realization of the hope expressed by the *British Medical Journal*, and re-echoed by the *Lancet*, that a clause should be inserted to provide for the inspection of druggists' shops.

Certainly the general reception of the Bill in the House this morning did not appear to bear out the announcement in the *Lancet* last week, that the Government was prepared to carry it, without regard to the objections of those most interested; and the prediction ventured this week that a few hours would probably decide the fate of the Bill was strikingly negatived at the very moment when that prediction was passing through the press.

UNIVERSITY NOTES.

At the recent Examinations of the University of London, Mr. William Augustus Tilden, Demonstrator in the Laboratory of the Pharmaceutical Society, passed the D.Sc. examination. We see from the official report that a strange mistake has been made in the account given of Dr. Tilden's scientific education, inasmuch as he is stated to have been a student of the Royal College of Chemistry. This was not the case, and as Dr. Tilden is one of the most distinguished students of the School of Pharmacy, we cannot, in justice to the Society, do otherwise than correct the error of the official report of the University of London by stating that he merely attended some of Professor Hofmann's lectures at the Royal College of Chemistry, and that with the exception of private study he received his scientific education in the laboratory of the Pharmaceutical Society at the time when Mr. Allchin occupied the position now held by Dr. Tilden.

The duties of the Vice-Chancellor's office in the University of London, vacated by the death of Mr. Grote, will for the present, it is understood, be discharged by Sir Edward Ryan. The President's chair at University College, vacant from the same cause, is to be filled by Lord Belper. Notwithstanding the alleged increased severity of the matriculation examination at this University, and the large number who have failed in recent years, the number of candidates presenting themselves on the last occasion was larger than in any previous year, being over six hundred.

An offer of £2000 has been made towards the proposed establishment of a chair of applied physics in the Andersonian University at Glasgow, and five scholarships of the yearly value of £50 each, are to be founded in connection with the recently-added chair of technical chemistry. A college of technology, also, is contemplated in Glasgow.

It is announced that upwards of £22,000 of the sum estimated to be required for the College of Physical Science at Newcastle has already been subscribed.

ILLEGAL SALE OF POISONS.

Though we think it desirable that steps should be taken to enforce the provisions of the Pharmacy Act in regard to the sale of poisons, and that persons who persist in disregarding those provisions should be prosecuted in conformity with the Act, it is at the same time highly desirable to avoid any appearance of oppressive application of the law, and that any steps taken with the object stated should be taken upon unquestionably good grounds. We fear that in the case reported at p. 38 this has not been done; for it appears to us more than doubtful whether prussiate of potash comes within the scope of the words "all metallic cyanides." In the first place, this salt is not a cyanide, but a ferrocyanide; then again,—what is still more important,—it is, *de facto*, not a poison any more than cream of tartar is. For this latter reason alone, it should not be comprised by the terms of the schedule; and if those terms be held to include it, it seems equally clear that the schedule needs revision.

A CONFERENCE QUESTION.

The letter published with this title at p. 40, relates to a point which we think should receive attention; and, while we have for that reason suggested to our correspondent that he should communicate with the Local Secretary in Edinburgh, it may not be out of place to express the opinion that the opportunity of promoting "friendly intercourse among those engaged in pharmacy," which is afforded by having a common place of meeting together in the evenings during the Conference meeting, is one of the most valuable features of this annual gathering. We believe also that, quite apart from the agreeable nature of those evening meetings, many members of the Conference share with us the opinion expressed as to their higher utility.

In a recent number of the *Lancet* an opinion is expressed that social gatherings, like the Conversazione of the College of Physicians, the Royal Society, the Pharmaceutical Society, the Society of Arts, etc., might be multiplied with great advantage; and that if professional and scientific men could be more frequently brought together for the purpose of pleasant mutual intercourse,—to examine the latest inventions in science and the latest novelties in connection with their calling, or to chat about politics and things in general affecting them,—jealousies would be softened down, and a wider spirit of charity would grow up amongst them. The Editor of the *Lancet* thinks that this course would be of special service to the medical profession, and we believe it would be equally serviceable to pharmacists.

Since visitors to the Conference will have to reach Edinburgh on the Monday, and will not participate in the advantage given to members of the British Association, as regards the extension of the usual limits of return tickets, we may mention that tourists' return tickets, available for a month, can be obtained at any time. The charges for these tickets are £6. 3*s*. first-class, and £2. 10*s*. third-class.

REPORT OF THE COMMITTEE TO DIRECT THE OPERATIONS OF THE SOCIETY IN COMMUNICATING WITH THE LOCAL SECRETARIES AND MEMBERS UPON THE SUBJECT OF OPPOSING THE BILL INTITULED AN ACT TO AMEND THE PHARMACY ACT, 1868.

The following is tabulated from the returns forwarded by Local Secretaries as to Petitions presented against the Bill. In some instances the number of Chemists and Druggists in the locality has not been supplied.

Name of Town.	No. of Chemists and Druggists in Town.	No. of Signatures.
Abingdon	6	6
Ashby-de-la-Zouch	5	4
Ashton-under-Lyne	21	21
Aylesbury	6	6
Banff, etc.	..	18
Barnet	3	3
Barnsley	14	14
Barnstaple	8	8
Basingstoke	..	5
Bath	30	21
Belfast	12	12
Belper	..	18
Berwick-on-Tweed	10	9
Bewdley	3	3
Bideford	9	10
Birkenhead	34	37
Birmingham	..	56
Blackburn	5	22
Bolton, etc.	38	32
Bradford	60	42
Bridgnorth	5	5
Bridlington	9	8
Bridport	3	0
Brighton	52	52
Bristol	..	45
Bromley	7	7
Burnley	..	10
Bury St. Edmund's	..	16
Buxton	4	4
Canterbury	..	11
Cardiff	24	14
Cardigan	6	6
Carlisle	23	19
Chatham and Kent	16	15
Chatteris		all
Chelmsford	7	7
Cheltenham	..	22
Chesterfield	4	20
Chichester	11	9
Cirencester	8	8
Colchester	10	10
Coventry	20	20
Crossbills	1	1
Darlington	14	9
Denbigh	4	4
Denton	..	3
Derby	28	25
Doncaster	12	12
Dorchester	4	4
Dorking	5	5
Dover	19	17
Dunfermline	5	4
Durham	8	6
Ealing	14	14
Edinburgh	..	61
Elgin	4	4
Evesham	7	7
Falmouth	3	3
Farnham	3	2
Flint	2	6
Folkestone, etc	14	12
Forfar	10	10
Gainsborough	11	7
Gateshead	9	7
Glasgow	70	60
Goole and district	13	10
Gosport	6	6
Gravesend	11	11
Great Grimsby	15	13
Great Yarmouth	24	24
Greenock	16	15
Greenwich	15	15
Haddington	5	..
Hastings	27	25
Hereford	14	13
High Wycombe	..	8
Horncastle	9	9
Horsham	3	3
Ipswich	19	17
Kendal and Ambleside	9	9
Kidderminster	9	8
King's Lynn	19	19
Kingston-upon-Hull	124	88
Kingston-on-Thames	11	10
Knaresborough	..	6
Knutsford	5	5
Launceston	4	4
Leamington	..	..
Leek	4	4
Leicester	..	49
Leighton Buzzard	7	7
Leith Burghs	20	19
Leominster	5	5
Lewes and district	30	15
Lewisham, Lee, etc.	..	12
Lincoln		All but 2
Ludlow	9	9
Lyme Regis	8	7
Macclesfield	14	14
Maidenhead	6	6
Maldon (Essex)	6	6
Margate	11	10
Market Harborough	3	3
Middlesborough	14	14
Montrose	6	6
Newark	13	13
Newbury	..	
Newcastle-on-Tyne	70	70
Newcastle-under-Lyme	7	7
Newport	5	4
New Sarum	9	7
Newton	10	9
Northallerton	3	2
Northampton	19	18
Norwich	..	27
Nottingham	80	76
Odiham	4	3
Oldham	..	50
Otley, Burley, etc.	7	7
Oxford	27	25
Pembroke Dock	4	4
Perth	10	10
Peterborough	12	11
Portsmouth	47	41
Richmond (Yorks.)	6	6
Ripon	7	6
Rochdale	23	21
Rochester and Strood	12	12
Rugby	4	3
Runcorn and Widness	7	10
Ryde	9	8
St. Alban's	7	7
St. Andrew's	4	3
St. Ives	15	15

Name of Town.	No. of Chemists and Druggists in Town.	No. of Signatures.
Scarborough	20	20
Selby	7	6
Shaftesbury	3	3
Sheffield	100	70
Southampton	24	18
Southport	12	12
South Shields	15	13
Spalding	7	6
Staleybridge	8	7
Stamford	7	8
Stirling & Bridge of Allan	7	5
Stockton-on-Tees	16	14
Stoke-on-Trent	40	33
Stowmarket	4	4
Sunderland	46	38
Sydenham, etc.	15	14
Tamworth	5	4
Taunton	14	13
Tewkesbury	7	7
Thirsk	4	4
Tiverton	8	10
Truro	7	6
Tunbridge Wells	20	19
Ulverton district	12	12
Wallingford	3	3
Walsall	All	
Wandsworth	5	5
Wareham	2	2
Watford	11	11
Whitby	6	6
Whitehaven	17	15
Windsor	16	14
Welshpool district	9	8
West Hartlepool	14	12
Weston-super-Mare	11	10
Woolwich	17	13
Worcester	29	27
Wrexham	14	7

Other Petitions against the Bill from the following places have been forwarded for presentation through the Manchester Chemists' Defence Association.

Alford.
Atherstone.
Ball's Pond Road.
Barton-on-Humber.
Bawtry.
Bayswater.
Beverley.
Bilston.
Bishop Auckland.
Blackpool.
Brechin.
Bridlington Quay.
Brigg.
Bury.
Carmarthen.
Chorley.
Cleckheaton.
Colne.
Congleton.
Cradley Road.
Crewe.
Crosshire.
Devonport.
Dewsbury.
Diss.
Driffield.
Dundee.
Eastbourne.
Eastwood.
Eccles.
Exeter.
Furton.
Gort.
Grassington.
Guildford.
Halifax.
Hampstead.
Harrogate.
Hartlepool.
Haslingden.
Hatford.
Haverhill.
Heywood Lane.
Hyde.
Ilfracombe.
Islington, 2 parts.
Kilburn.
Kirriemuir.
Lambeth.
Liscard.
Liverpool.
London.
Louth.
Lowestoft.
Lytham.
Maidstone.
Manchester.
Market Weighton.
Newtown.
Notting Hill.
Odey.
Patrington.
Penrith.
Plymouth.
Poole.
Radcliffe.
Reading.
Ringwood.
Sittingbourne.
Stirling.
Stockaback and neighbourhood.
Stockport.
Stoke.
Swansea.
Teignmouth.
Tenby.
Todmorden.
Wakefield.
Warminster.
Wenlock Road.
Winchester.
Woburn.
York.

Proceedings of Scientific Societies.

ROYAL INSTITUTION OF GREAT BRITAIN.

At the General Monthly Meeting on Monday, Sir HENRY HOLLAND, Bart., M.D., D.C.L., F.R.S., President, in the chair, Mr. William Amhurst Tyssen Amhurst, F.S.A., M.R.S.L., and Mr. Lawrence Trent Cave, F.R.G.S., were elected members of the Royal Institution. The special thanks of the members were returned for donations to "the fund for the promotion of experimental researches." The special thanks of the members were returned to the Lord Lindsay for his present of a valuable spectroscope. The presents received since the last meeting were laid on the table, and the thanks of the members returned for the same.

Parliamentary and Law Proceedings.

HOUSE OF LORDS.

PETROLEUM BILL.—*July* 4.—The Petroleum Bill passed through Committee. Petitions against the Bill were presented by the Earl of Carnarvon from—

Birmingham, Merchants at.
Bristol, Oil-merchants at.
Exeter, Merchants and Shipowners at.
Hull, Merchants at.
London, Merchants and Dealers in Petroleum in.
Nottingham, Shipowners at.

HOUSE OF COMMONS.

PHARMACY ACT (1868) AMENDMENT BILL.—*June* 29.—Dr. BREWER gave notice that in Committee on this Bill he would move, in clause 2, page 2, line 1, to leave out from "If at any time" to end of clause.

Petitions against the Bill were presented from—

Alford, by Mr. Chaplin.
Basingstoke, by Mr. Sclater-Booth.
Belfast, by Mr. M'Clure.
Colchester, by Dr. Brewer.
Dorchester, by Colonel Napier Sturt.
Dover, by Major Dickson.
Gravesend, by Sir C. Wingfield.
Greenock, by Mr. Grieve.
Knaresborough, by Mr. Illingworth.
Leith, Portobello, and Musselburgh, by Mr. Macfie.
Lynn, by Mr. Bourke.
Margate, by Mr. G. Milles.
Midland Counties Chemists' Association, by Mr. Dixon.
Montrose and Brechin, by Mr. Baxter.
Newcastle-under-Lyme, by Mr. W. S. Allen.
St. Alban's, by Mr. Abel Smith.
Stamford, by Sir J. Hay.
Truro, by Sir F. M. Williams.
Weston-super-Mare, by Major Allen.
Woburn, by Colonel Gilpin.
Worcester, by Mr. Laslett.
Wrexham, by Sir W. W. Wynn.
York, by Mr. James Lowther.

June 30.—Petitions against the Bill were presented from—

Ambleside, by Mr. Jacob Bright.
Birkenhead, by Mr. Laird.
Carmarthen, by Colonel Stepney.
Chesterfield, by Captain Egerton.
Crosshills, by Lord F. Cavendish.
Deal and Walmer, by Mr. H. A. Brassey.
Doncaster, by Mr. Jacob Bright.
Ealing, Acton, and Hanwell, by Viscount Enfield.
Elgin, by Colonel Grant.
Exeter, by Mr. Bowring.
Falmouth, by Mr. Eastwick.
Flint and Holywell, by Lord R. Grosvenor.
Folkestone, Hythe, and Sandgate, by Baron M. de Rothschild.
Guildford, by Mr. G. Onslow.
Hartlepool and West Hartlepool, by Mr. Ward Jackson.
Haverhill, by Lord A. Hervey.
Kirriemuir, by Mr. Carnegie.
Kirton-in-Lindsey, by Sir M. Cholmeley.
Lewes, by Lord Pelham.
Manchester and Salford, by Mr. Jacob Bright.
Oldham and district, by Mr. Hibbert.
Penrith, by Mr. N. Hodgson.
Ripon, by Sir Henry Storks.
South Shields, by Mr. Stevenson.
Stourport, by Colonel Anson.
Tiverton, by Mr. Denman.

July 3.—In answer to a question from Mr. T. Cave, whether the attention of the Government had been drawn to the numerous petitions that have been presented against the Pharmacy Bill, and whether it was intended to proceed with the Bill during the present session,—

Mr. W. E. Forster said the Government intended to proceed with the Bill during the present session, its object being mainly to ensure that the first clause of the Pharmacy Act, passed in 1868,—which said there should be regulations for the keeping, dispensing and selling of poisons,—should be complied with. He was aware that several petitions had been presented against the Bill from chemists and druggists throughout the country, but he hoped to be allowed to take the second reading on Thursday, with a view afterwards to go into Committee, *pro formâ*, and reprint the Bill with amendments, which, he believed, would meet the wishes of many persons connected with the trade.

Petitions against the Bill were presented from—

Barnsley, by Mr. F. H. Beaumont.
Belper and Ripley, by Mr. R. Smith.
Birmingham and neighbourhood, by Mr. Dixon.
Bristol, by Mr. Morley.
Cardigan, by Sir T. Lloyd.
Leighton Buzzard, by Colonel Gilpin.
Lyme Regis and Axminster, by Mr. Portman.
Market Harborough, by Mr. Pell.
Newtown, by Mr. Hanbury-Tracy.
Otley and Ilkley, by Mr. Denison.
Patrington, by Mr. Broadley.
Perth (County of), by Mr. Parker.
Poole, by Mr. A. E. Guest.
Ryde, by Mr. B. Cochrane.
Shrewsbury, by Mr. Straight.
Southampton, by Mr. G. Gurney.
Stoke-upon-Trent, by Colonel Roden.
Tenby, Narberth, and Saundersfoot, by Mr. T. C. Meyrick.
Warrington, by Mr. Ryland.
Welshpool, by Mr. C. W. W. Wynn.
Whitby, by Mr. W. H. Gladstone.
Windsor, Eton, and Slough, by Mr. Eykyn.

July 4.—Petitions against the Bill were presented from—

Ashford, by Mr. G. Milles.
Banff, Macduff, Porsoy, etc., by Mr. Grant Duff.
Barnet, by Mr. H. R. Brand.
Bromley and neighbourhood, by Mr. Mills.
Cirencester, by Mr. Bathurst.
Edinburgh, by Mr. M'Laren.
Gosport, by Mr. W. F. Cowper-Temple.
Horsham and Crawley, by Mr. Hurst.
Howden, by Mr. Sykes.
Huddersfield, by Mr. Leatham.
Leicester, by Dr. Brewer.
Mansfield, Mansfield Woodhouse and Sutton, by Mr. F. C. Smith.
Merthyr Tydvil and Aberdare, by Mr. Fothergill.
Odiham District, by Mr. G. Sclater-Booth.
Portsmouth, by Sir J. D. Elphinstone.
Ramsgate, by Mr. Pemberton.
Runcorn, by Mr. W. Egerton.
Salisbury, by Dr. Lush.
Tetbury, Northlead and Fairford, by Sir M. Hicks Beach.
Ulverstone and Chorley, by Colonel Wilson Patten.
Watford, by Mr. Cowper.
Westminster, by Mr. W. H. Smith.

July 5.—Petitions were presented against the Bill from—

Bedford, by Mr. Heron.
Bushey and Rickmansworth, by Mr. H. R. Brand.
Kendal, by Mr. W. Lowther.
St. Ives, Camborne, Hayle and Penzance, by Mr. Magniac.
Wolverhampton, by Mr. Villiers.

July 6.—The Pharmacy Act (1868) Amendment Bill.—Mr. W. E. Forster: I beg to move the second reading of this Bill.

Mr. M'Cullagh Torrens: As I understand, it will be convenient that the Government should obtain the assent of the House for reading this Bill a second time to-night (no, no). If honourable gentlemen will favour me with their attention, I think I can satisfactorily explain why it is for the interest of those for whom they, as well as myself, are interested in this matter, that the course I am about to propose should be taken. I understand—in fact, I have reason to know—that the Government intend to bring forward a number of new clauses which may or may not in the estimation of the trade seriously affect their position. I think it is only fair that the country should know what these clauses are before we are called upon to discuss them (hear, hear). I have not the faculty which some honourable members seem to think they have, of being able to discuss clauses before they know what they really are. Having charge of this matter on behalf of a very numerous body of the trade, I am authorized by them to state that they prefer seeing the proposed new clauses before we come to discuss the Bill (hear, hear). If the right honourable gentleman who has charge of the Bill will consent that no discussion shall take place on the merits of the Bill until it is proposed to go into Committee on the measure, I should think, for the benefit of those I so unworthily though sincerely represent, that we should not be called on to discuss it at this hour (quarter past 1 o'clock), which must be left uncompleted, however regularly conducted. The Government having changed their mind on some very important details of the measure, it was but fair that we should know the nature of this altered Bill, and that time should be given (say ten days) for further consideration of the amended Bill by those interested in the country, before we are called on to pronounce an opinion upon it.

Mr. B. Cochrane: I quite concur in what has fallen from the honourable gentleman the member for Finsbury. I know there is a large body of persons in the country who are deeply interested in this Bill.

Mr. W. E. Forster: I have no intention of asking the House to enter on a discussion of the Bill, or to go to a division this evening, but I should be very glad if the House would assent to the course recommended by the honourable gentleman the member for Finsbury (no, no); and for this reason, a great deal of interest is felt in the Bill by gentlemen in the country, who are principally concerned in the progress of the measure. I believe my honourable and learned friend is only speaking the truth when he says that a large number of those gentlemen will be glad to know how the Government propose to meet their objections. If I am allowed to take the second reading I should not consider the House pledged in any way to the merits of the Bill, but that is the only way I can put before them the Amended Bill, and I propose to go into Committee, *pro formâ*, to-morrow or the next day, for the purpose of printing the Amendments (no, no, withdraw). There is no other way by which the views of the Government can be placed before the House, or the members of the trade be informed of the manner in which the Government propose to deal with it (withdraw). I undertake not to discuss the measure until Monday week, and I really will pledge the Government, in the strongest way possible, to allow an opportunity for discussing the Bill.

Sir H. J. Selwin-Ibbetson: I hope the House will not agree to what has been just proposed (hear, hear), and I will state my reasons for it. I am quite aware that the country is very anxious to see any amendments the Government propose to make in the Bill, but I confess I look with some alarm on a practice that is growing up in this House of assenting to the second reading of Bills and affirming principles without discussion (hear, hear). Supposing the Government to be anxious to amend the Bill, and that the country should have the earliest opportunity of knowing what they propose, it was in their power to place the amendments on the paper (hear, hear). They would then become public property and be circulated throughout the country the same way as if the Bill were committed *pro formâ*, and as then corrected, to be sent out. By such a course the House would not be pledged to the principle of a Bill we have not discussed. I hope the House will mark its sense of objection to what I think is a principle too lightly adopted (hear, hear).

Mr. W. E. Forster: Allow me for one moment. My sole object is to get the alterations of the Government brought before the House and the country as soon as possible. Although it is a very unusual course to take to place amendments on the paper before a Bill is read a second time, yet, as it appears to be the wish of the House that it should be done, I will do so (hear, hear).

Dr. Dalrymple: I am sorry to find there appears to be so strong an opposition to the Bill. The principle involved in the Bill being read a second time is as clear as possible, viz. that there is a right to put certain restrictions on the sale of poisons. That these restrictions have not been tested is the fault of the parties themselves; but nothing could be more unfair or unjust than that this Bill should pass as it now stands, and but for the fact that it was to be amended and fully and fairly put before the House and discussed, I should oppose the measure.

Mr. Beresford Hope: I rise to second the statement of the honourable baronet the member for West Essex. I am glad the House has made this protest against reading Bills a second time in the manner now proposed.

Mr. W. E. Forster: I will take the second reading on Monday week.

Petitions were presented against the Bill from—

Bangor and neighbourhood, by Mr. Jones-Parry.
Cheltenham, by Mr. H. B. Samuelson.
Hereford, by Major Arbuthnot.
Liverpool, by Lord Sandon.
Maidenhead, by Mr. Walter.
Manchester Society of Chemists and Druggists, by Mr. Jacob Bright.
Radcliff Bridge, by Mr. Jacob Bright.

In order to afford a ready means of comparing the amendments with the Bill as at first introduced, we reprint them here, together with the original draft and the recommendations lately issued by the Pharmaceutical Society as to the keeping, dispensing and selling of poisons.

AMENDED FORM OF A BILL INTITULED AN ACT TO AMEND THE PHARMACY ACT, 1868.

*** *The amendments are in italics.*

Whereas under the Pharmacy Act, 1868, persons selling or keeping open shop for retailing, dispensing, or compounding poisons are required to conform to such regulations as to the keeping, dispensing, and selling of poisons as may from time to time be prescribed by the Pharmaceutical Society, with the consent of the Privy Council:

And whereas the Pharmaceutical Society have failed to submit for the consent of the Privy Council any regulations for the above purposes, and it is expedient to make further provision for the making of such regulations:

Be it enacted by the Queen's Most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows;

1. This Act shall be construed as one with the Pharmacy Act, 1868 (in this Act referred to as the principal Act), and with the Act of the Session of the thirty-second and thirty-third years of the reign of her present Majesty, chapter one hundred and seventeen, intituled "An Act to Amend the Pharmacy Act, 1868," and those Acts and this Act may be cited together as the Pharmacy Acts, 1868 to 1871, and each of the above-mentioned Acts and this Act may be cited as the Pharmacy Act of the year in which it was passed.

2. The recited powers of the Pharmaceutical Society of Great Britain under the principal Act shall cease.

After the first day of October, 1871, *the regulations as to the keeping, dispensing and selling of poisons within the meaning of the principal Act, which are set out in the schedule to this Act, shall be observed by all persons who keep open shop for the retailing, dispensing or compounding of poisons, and shall have the same effect as regulations prescribed in manner specified in the principal Act, and the provisions of the principal Act relating to such regulations shall be construed accordingly.*

Every person who keeps open shop for the retailing, dispensing or compounding of poisons, and fails to conform with any of the said regulations shall, notwithstanding anything contained in section sixteen of the principal Act, or in section one of the Pharmacy Act, 1869, *be liable to a penalty not exceeding in the case of the first offence five pounds, and in the case of a second or any subsequent offence ten pounds, which penalties may be recovered on summary conviction as penalties under the principal Act may be recovered.*

The Council of the Pharmaceutical Society may from time to time, by resolution approved by the Privy Council, revoke, alter and add to the regulations contained in the schedule to this Act, or made in pursuance of this section, and make new regulations in their place; and such resolution so approved shall, on coming into operation, have effect as if it were contained in the schedule to this Act.

Every resolution so approved shall be published in such manner as the Privy Council may direct, and shall come into operation at the date of such publication, or such later date as may be specified in the resolution.

Sections ten and eleven of the principal Act are hereby repealed, and in lieu thereof be it enacted as follows:—

It shall be the duty of the Registrar to make and keep a *correct register, in accordance with the provisions of the principal Act, of all persons who are entitled to be registered under that Act, and to erase the names of all registered persons who have died or ceased to carry on business, and from time to time to make the necessary alterations in the addresses of the persons registered under the principal Act.*

Every registered person shall send by post, by a prepaid letter, to the Registrar, notice of his ceasing to carry on business, and of any change in his address.

To enable the Registrar duly to fulfil the duties imposed upon him, it shall be lawful for him to send by post a prepaid letter to any registered person, addressed to him at his registered address, and enclosing a form to the effect that the person signing the same carries on business at the address therein specified, and requiring such person to return the form, duly filled up and signed, to the Registrar within ten days from the date of the letter, and stating that in default further proceedings will be taken under this section.

If the letter so sent is returned to the Registrar through the dead letter branch of the Post Office, the Registrar may erase from the register the name of the person to whom the same was addressed.

If the letter is not so returned to the Registrar, but no answer is received thereto by the Registrar within three weeks after the date of the same being sent, the Registrar may send by post a prepaid registered letter, addressed as aforesaid, to the like effect as the former letter, but requiring the person to whom it is addressed to send with the form a fee of sixpence, and stating that if he fail to return such form duly filled up and signed, and such fee, his name will be erased from the register.

If the Registrar does not receive the form duly filled up and signed, and such fee, within fourteen days after the last-mentioned letter is sent, the Registrar may erase the name of the person to whom the same was sent from the register.

Any name erased in pursuance of this section may be restored by direction of the Council of the Pharmaceutical Society upon the payment of a fee of ten shillings, but the Council may remit the fee if it appear to them that the person whose name has been erased has, by reason of not having received the registered letter or otherwise, been innocent of any default under this section.

Section fourteen of the principal Act (which relates to the punishing of persons procuring registration by false representations) shall extend to any person who wilfully makes any false statement in any form sent to the Registrar in pursuance of this section, or in any other communication, verbal or written, to the Registrar relative to or to the same effect as such form, and every such person shall be liable to be punished accordingly.

The term "address" of a person in this section means the place at which he carries on business.

Schedule.

Regulations for the Keeping, Dispensing and Selling of Poisons within the meaning of 31 *&* 32 *Vict. c.* 121, *to be observed by persons keeping open shop.*

(1.) *In the keeping of poisons each bottle, vessel, box or package containing a poison shall be labelled with the name of the article, and also with some distinctive mark indicating that it contains poison.*

(2.) *In the keeping of poisons each poison shall be kept on one or other of the following systems, namely :—*

(a) *In a bottle or vessel tied over, capped, locked or otherwise secured, in a manner different from that in which bottles or vessels containing ordinary articles are secured in the same warehouse, shop or dispensary; or*

(b) *In a bottle or vessel rendered distinguishable by touch from the bottles or vessels in which ordinary articles are kept in the same warehouse, shop or dispensary; or*

(c) *In a bottle, vessel, box or package kept in a room or cupboard set apart for dangerous articles.*

(3.) *In the dispensing or selling of poisons, every bottle or vessel containing an embrocation, lotion or liniment in the composition of which any poison forms a part shall have affixed thereto (in addition to the name of the article and to any particular instructions for its use) a label, giving notice that the contents of the bottle or vessel are not to be taken internally.*

In this schedule "poison" means a poison within the meaning of the "Pharmacy Act, 1868."

ORIGINAL DRAFT OF A BILL INTITULED AN ACT TO AMEND THE PHARMACY ACT, 1868.

*** *The parts amended are in italics.*

Whereas under the Pharmacy Act, 1868, persons selling or keeping open shop for retailing, dispensing or compounding poisons are required to conform to such regulations as to the keeping, dispensing and selling of poisons as may from time to time be prescribed by the Pharmaceutical Society, with the consent of the Privy Council:

And whereas the Pharmaceutical Society have failed to submit for the consent of the Privy Council any regulations for the above purposes, and it is expedient to make further provision for the making of such regulations:

Be it enacted by the Queen's Most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in the present Parliament assembled, and by the authority of the same as follows :—

1. This Act shall be construed as one with the Pharmacy Act, 1868 (in this Act referred to as the principal Act), and with the Act of the session of the thirty-second and thirty-third years of the reign of her present Majesty, chapter one hundred and seventeen, intituled "An Act to amend the Pharmacy Act, 1868," and those Acts and this Act may be cited together as the Pharmacy Acts, 1868 to 1871, and each of the above-mentioned Acts and this Act may be cited as the Pharmacy Act of the year in which it was passed.

2. The recited powers of the Pharmaceutical Society of Great Britain under the principal Act shall cease, *and the Council of the said Society may from time to time submit to the Privy Council regulations as to the keeping, dispensing and selling of poisons within the meaning of the principal Act, and as to revoking or amending any such regulations previously made, and the Privy Council may, if they think fit, by order approve of such regulations.*

If at any time it appear to the Privy Council that there are no regulations for the time being in force under the principal Act as to the keeping, dispensing and selling of poisons within the meaning of the principal Act, the Privy Council may serve a notice on the Council of the Pharmaceutical Society requiring them to frame and submit for the approval of the Privy Council regulations as to the matters aforesaid, and if the Council of the Pharmaceutical Society, within the time limited by such notice, not being less than two months from the date of the service of the notice, make default in framing such regulations, or obtaining the approval of the Privy Council thereto, the Privy Council may themselves frame regulations as to the matters aforesaid.

All regulations approved or framed by the Privy Council in pursuance of this section shall have the same effect as regulations prescribed in manner specified in the principal Act.

RECOMMENDATIONS BY THE PHARMACEUTICAL SOCIETY OF GREAT BRITAIN FOR THE KEEPING, DISPENSING AND SELLING OF POISONS.

1. *That in the keeping of poisons each bottle, vessel, box, or package containing a poison be labelled with the name of the article, and also with some distinctive mark indicating that it contains poison.*

2. *Also that in the keeping of poisons, each poison be kept on one or other of the following systems, viz.*

(a) *In a bottle or vessel tied over, capped, locked, or otherwise secured in a manner different from that in which bottles or vessels containing ordinary articles are secured in the same warehouse, shop, or dispensary; or*

(b) *In a bottle or vessel rendered distinguishable by touch from the bottles or vessels in which ordinary articles are kept in the same warehouse, shop, or dispensary; or*

(c) *In a bottle, vessel, box, or package kept in a room or cupboard set apart for dangerous articles.*

3. *That in the dispensing and selling of poisons all liniments, embrocations, and lotions containing poison be sent out in bottles rendered distinguishable by touch from ordinary medicine bottles, and that there also be affixed to each such bottle (in addition to the name of the article, and to any particular instructions for its use) a label giving notice that the contents of the bottle are not to be taken internally.*

SPURIOUS TEA.—*July* 3.—Mr. G. Gregory asked the President of the Board of Trade whether his attention had been called to the importation of spurious tea; and whether he had ascertained if the law, as it at present stood, prevented such importation, or provided for the summary condemnation of such tea; and, if it did not, whether he was prepared to propose legislation upon the subject.

Mr. Chichester Fortescue said he had lately received an important deputation on this subject from the sanitary authorities of the City of London, who explained to him the great abuses which occurred in the importation of those spurious teas. They exhibited to him various samples of a very remarkable character—one consisting of matter so decayed that it was offensive to the smell, and another sample containing such a quantity of iron filings that they were visible to the eye by the use of a magnet. There were other specialities of that kind. He had since then inquired into the state of the law, and had reason to think that the Commissioners of Customs had no power to prevent these practices provided that the duty were duly paid. Whether it would be right to give the Commissioners of Customs such powers, which were beyond their usual functions, he was not then prepared to say; but he would undertake to consider the question, and was now in communication with the Chancellor of the Exchequer respecting it.

TWO CHILDREN POISONED BY A WRONG MEDICINE.

On Friday, June 30, Dr. Lankester held an inquest on the bodies of Ada and Arthur Ford, twin children, aged fourteen days, who died from the effects of poison given in mistake for another medicine at the Islington Dispensary. From the evidence it appeared that the two children being somewhat poorly, the nurse in attendance upon Mrs. Ford, the mother of deceased, attended at the dispensary, and having explained how the children were, Mr. Waller, one of the medical officers, prescribed a rhubarb and soda powder to be given, a fourth part to each child occasionally. The powders were administered about half-past eleven o'clock. About two o'clock the mother looked at the children and said she thought one was dead, and the other looked so bad she was sure they were poisoned. She ran to the dispensary for a doctor, and Mr. Waller attended.

Mr. Arthur Waller, surgeon to the Islington Dispensary, deposed that he prescribed a rhubarb and soda powder, as stated, with instructions that they should be divided into four, and a part given to each child. On being sent for on Tuesday he found one child dead and the other dying. On examining the powder he found it was not what he had ordered, but a twenty-grain compound "Kino" powder, containing a quarter of a grain of opium. There was no doubt but the administration of this powder had killed the children. He had made inquiries, and as the drawer in which the powders were kept contained sixteen partitions, he could only account for these powders getting into the wrong place by accident.

Mr. John Levygill, the apothecary at the Dispensary, said he did not recollect the application for a rhubarb and soda powder, but if it were made he gave them what he supposed to be one. As the "Kino" powders were next to the rhubarb and soda, the latter might have got into the wrong compartment. The powders were all in white paper, and there were only labels on each compartment.

Mr. J. T. Glover, surgeon, stated that he had made a *post-mortem* examination of the bodies, and found that the children had been poisoned by opium. The same quantity of opium would have killed a stronger child than either of the deceased.

The jury returned a verdict—"That the deaths had taken place from the effect of an overdose of opium through accidental causes." The jury were, however, also strongly of opinion that were all poisonous powders put in coloured paper, there would be no recurrence of so serious a mistake.—*Daily News*.

DEATH FROM AN OVERDOSE OF CHLORAL HYDRATE.

An inquest was held on Friday, June 14, at Huddersfield, to inquire into the circumstances attending the death of Mr. J. S. Bowman, a commercial traveller. The deceased was stopping at the George Hotel, and on going to bed on Wednesday night had requested that he might be called at seven o'clock the next morning. This was accordingly done, but the deceased did not make his appearance; about two o'clock therefore the door was broken open, when he was found to be lying in the bed quite dead. Evidence was given that he appeared in good health and spirits the night before. In his portmanteau was found a corked bottle containing chloral hydrate. There was a glass found in the room, but it had nothing but a little water in it.

Walter Abraham Grace, of Bradford, said, I am assistant to Mr. F. M. Rimmington, pharmacist and chemist, Bradford. The directions on the bottle produced are in my handwriting. I have just seen the body of deceased, and identify him as being the same person who called at my employer's shop between one and three o'clock on Tuesday afternoon. He asked Mr. Rimmington's son for six doses of the hydrate of chloral, with 30 grains in each dose. Previous to supplying him, I, according to instructions, consulted Mr. Rimmington, who interrogated the man as to his knowledge of the article. The deceased said he was perfectly aware of its properties, and that he was perfectly familiar with it, having taken it many times before. Mr. Rimmington said the deceased's reply was quite satisfactory, and they might have taken him for a medical man, he was so familiar with the article. Mr. Rimmington then came to my dispensing counter and told me I was to make up the mixture. I made up the mixture, and placed it in the bottle now produced. Mr. Rimmington saw me make up the mixture and write a label, but, not being satisfactory, he told me to write another copy. The label contains the words, "The mixture, containing 30 grains chloral hydrate in each ounce, one-sixth part for a dose." The bottle has upon it the scale for the six doses. I wrapped up the bottle, and explained to the deceased personally that one-sixth part contained 30 grains, and, from my recollection, he replied that he was perfectly satisfied, as he understood how to take it, having taken it before. He did not tell me for what specific purpose he wanted the chloral hydrate, nor did he complain of any illness. He seemed quite sober. Thirty grains are below the average dose. I think six or eight doses is quite as much as we should supply at one time, but we should not supply that quantity, unless we knew the man had taken it before, or that he was familiar with its properties.

Mr. Hewby, surgeon, said that he found the body perfectly cold and rigid; the face was congested and the hands were blue. In the absence of a *post-mortem* examination, he thought death had been caused by an overdose of the mixture of chloral hydrate.

The jury returned a verdict that death was caused by an overdose of chloral hydrate, administered by himself without any intention to destroy life.

Selling Poison without a Label.

On Tuesday, July 4, at the Clerkenwell Police Court, William Jackson, of 11, Macclesfield Street North, City Road, was summoned before Mr. Cooke by Inspector James Taylor of the N division, charged as follows: "for that you on the 23rd day of June did unlawfully sell by retail certain poison, to wit, 'prussiate of potash,' without the box, bottle, vessel, wrapper or cover in which such poison was contained being distinctly labelled with the name of the article and the word 'poison,' and with the name and address of the seller, contrary to the statute," etc.

Police-constable Nursey, 251 N, said that the defendant kept a small druggist's shop, and on the day in question he went there and asked to be served with a small quantity of prussiate of potash. He saw the defendant's wife and she went to the back of the shop and fetched the defendant. He said he would not let him have what he wanted, because he had got in trouble a short time before for selling poison. He had been given to understand that the defendant was a bricklayer by trade.

Mr. Thomas Shaw, a licentiate of the Apothecaries' Society of London, and registered, in answer to Mr. Cooke, said that prussiate of potash was a metallic cyanide and a poison.

Inspector Taylor said that these proceedings were taken owing to a man having poisoned himself with arsenic that had been purchased at defendant's shop.

The defendant, in reply to the charge, said that the constable, when he entered, was in his shirt sleeves, and saying that he was a shoemaker, asked for the stuff in the regular course of trade. He had that morning purchased one pennyworth of the same stuff without there being any label on it. It could be purchased at any oil shop in London, and more especially in St. Luke's.

Mr. Cooke said that did not justify the defendant in acting as he had done. The Act under which these proceedings were taken was passed expressly to regulate the sale of poison, and the defendant might have been charged with two offences, for the poison the defendant had sold was classed in schedule A of the Act. The defendant had committed an offence by selling that poison to any person whom he did not know, or who was introduced by some one he did not know. The only charge he had to deal with was the one before him, but the fact that a man had poisoned himself with poison that had been purchased at the defendant's shop only showed how important it was that the provisions of the Act should be fully carried out. He should have to make an example of the defendant for the sake of the public good, and should order him to pay a fine of £3 and the costs, or in default six weeks' imprisonment in the House of Correction. The defendant was removed in custody.—*Clerkenwell News.*

[*** The person prosecuted in this case was the owner of the shop referred to in the report of a case of poisoning by arsenic which was illegally sold at that shop. (See Vol. I., 3rd Ser., p. 1000.)—Ed. Ph. Journ.]

Notes and Queries.

*** *In order to facilitate reference, correspondents are requested to mark their answers in each case with the title and number of the query referred to.*

No notice can be taken of anonymous communications. All queries or answers should be accompanied by the name and address of the writer.

NOTICE.—*To prevent delay, correspondents are requested to send their communications to the Journal Department,* 17, *Bloomsbury Square, W.C., and not to the Publishers.*

EMPLASTRUM VESICANS MEDIOLANENSIS. Milanese Flies (Mouches de Milan):—

Burgundy Pitch, purified,
Yellow Wax,
Spanish Flies, powdered, of each 50 grammes.
White Turpentine, 10 grammes.
Oil of Lavender,
Oil of Thyme, of each, 1 gramme.

Melt the two first substances together, add the flies and digest over a water-bath for two hours, after which add the turpentine, and when that is dissolved, remove the vessel from the fire, taking care to stir continually till the mass is half cooled down, then aromatize with the volatile oils.

When specially indicated, dispense this plaster divided into small flattened balls weighing one gramme, wrapped into a piece of black taffeta 6 centimetres ($2\frac{3}{8}$ in.) in diameter, folded upon itself. The plaster is spread out upon this when used.

This elegant form of dispensing empl. cantharid. is common in France, although it is one of those preparations, the keeping on hand of which is not made obligatory on French apothecaries by their Pharmacopœia.—*American Pharmacist.*

CHLORAL HYDRATE AND COD-LIVER OIL.—The *Gaz. Farm. Ital.* advocates the addition of chloral-hydrate to cod-liver oil; it renders it much less nauseous, and prevents the night sweats of the phthisical patient, induces sleep, and creates appetite. It is prepared as follows:—

10 gr. pure chloral-hydrate crystals with 190 gr. cod-liver oil, digested in a sand-bath with gentle heat. Dose, six tablespoonfuls daily.

[266.]—SYRUPUS QUINIÆ ET MORPHIÆ BROMIDI.—*F. J. H.* asks for a formula for Syrupus quiniæ et morphiæ bromidi (Dr. B. W. Richardson's).

[267.]—LEMONADE POWDERS.—*A.* and *B.* will be obliged to any one who will favour them with a good formula.

[268.]—VARNISH FOR PILLS,—Would some of your readers be good enough to furnish me with a good recipe for varnishing pills to *shine* well. I have not found the usual process satisfactory.—J. T. Abbott.

[269.]—REMOVAL OF COFFEE STAINS.—*E. H. C.* would be obliged if any one would inform him how to remove coffee stains from a book; the paper is unglazed, of a rather common quality and slight blue shade.

[270.]—CEMENT FOR CORK.—Can any reader inform me of a substance that may be used for gumming strips of cork to bottle stoppers which will not give way like gum arabic when wet? or a composition that may be used for the same purpose?—J. S.

[271.]—DISPENSING.—*A. B. C.* asks how he can prepare from the annexed prescription a perfectly white creamy liniment which will not separate?

℞. Acid. Acet. fort. ʒss
Vitell. Ovi j
Ol. Terebinth.,
Aquæ, ana ℥iij.
M. ft. linim.

[272.]—SUPPOSITORIES.—Will one of the readers of the PHARMACEUTICAL JOURNAL oblige me with the best formula for a basis for belladonna, opium and camphor suppositories?—C.

[273.]—PODOPHYLLUM PILLS.—Will any correspondent oblige me with a formula for podophyllum pills?—A. P. S.

BOOKS RECEIVED.

TRAVELS OF A PIONEER OF COMMERCE IN PIGTAIL AND PETTICOATS: or an Overland Journey from China towards India. By T. T. COOPER. London: Murray. 1871.

THE HALF-YEARLY ABSTRACT OF THE MEDICAL SCIENCES, being a Digest of British and Continental Medicine and of the Progress of the Collateral Sciences. Edited by WILLIAM DOMETT STONE, M.D., F.R.C.S. Vol. liii. London: J. and A. Churchill.

RESOURCES OF THE SOUTHERN FIELDS AND FORESTS, MEDICAL, ECONOMICAL AND AGRICULTURAL; being also a Medical Botany of the Southern States; with Practical Information on the Useful Properties of the Trees, Plants and Shrubs. By FRANCIS PEYRE PORCHER, M.D. New Edition. Revised and largely augmented. Charlestown: Walker, Evans and Co. London: Trübner and Co., 60 Paternoster Row. 1869.

DISCOURSES ON PRACTICAL PHYSIC. By BENJAMIN W. RICHARDSON, M.A., M.D., F.R.S. London: J. and A. Churchill. 1871.

MEDIZINISCHE JAHRBUECHER HERAUSGEGEBEN VON DER K. K. GESELLSCHAFT DER AERZTE, redigirt von S. STRICKER. Parts 1 and 2. Vienna: Braunmüller. 1871.

DIE PFLANZENSTOFFE IN CHEMISCHER, PHYSIOLOGISCHER, PHARMAKOLOGISCHER UND TOXIKOLOGISCHER HINSICHT. Für Aerzte, Apotheker, Chemiker, und Pharmakologen bearbeitet von Dr. AUG. HUSEMANN und Dr. THEOD. HUSEMANN. Part IV., completing the work. Berlin. 1871.

BEMERKUNGEN UEBER DIE HEUTIGEN LEBENSVERHAELTNISSE DER PHARMACIE. By Dr. P. PHOEBUS. Vienna. 1871. From the Author.

The following journals have been received:—The 'British Medical Journal,' July 1; the 'Medical Times and Gazette,' July 1; the 'Lancet,' July 1; the 'Medical Press and Circular,' July 5; 'Nature,' June 29; the 'Chemical News,' July 1; 'Gardeners' Chronicle,' July 1; the 'Journal of the Society of Arts,' July 1; the 'Grocer,' July 1; 'Produce Markets Review,' July 1; the 'English Mechanic,' June 30; 'Bulletin de la Société Botanique de France,' vol. xviii. part 3; 'Proceedings of the Royal Institution'; the 'Pharmacist' for June; the 'British Journal of Dental Surgery' for July; the 'Food Journal' for July; the 'Milk Journal' for July; the 'Florist and Pomologist' for July; Evans, Lescher and Evans' 'Price Current' for July; 'Revista de Pharmacia e Sciencias Accessorias do Porto' for June; 'Zeitschrift des allgemeinen österreichischen Apotheker-Vereines' for July.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

POISON BOTTLES.

Sir,—Much has been said and written at various times in favour of our poisons being safe if kept in bottles of peculiar colours. Some gentlemen have also recommended a piece of sandpaper being placed on the back of the bottle, and others have strongly advised the use of fluted, spiked and angular bottles. Now, these may all be useful, but I do not consider any of them complete, because the sense of sight and touch would soon be familiar with them. When a man is distressed by too much, or, what is worse, by too little business, by long and anxious hours, by domestic and many other afflictions, he requires something more than either of the above bottles to arrest his attention should he unhappily become so distracted as to place his hand on the wrong one. He must have a physical difficulty in his way to arouse him to the fact that he is about committing a mistake, which may prove fatal to the person to whom the medicine is to be administered, as well as ruinous to himself. And this may be done by means of a very simple and inexpensive contrivance, and one which will create scarcely any delay in dispensing poisons. It is simply bands of india-rubber, arranged like the wire of a sodawater-bottle,—a collar embracing the neck of the bottle,—and attached to this a cross-band passing over the stopper, so that the stopper cannot be removed without pushing the cross-band off. And this arrangement would answer equally well for extracts, pots and jars; and if the cross-band had a loop at each extremity a suitable string might be substituted for the india-rubber collar, thus saving expense.

I should have suggested to the Society the above plan some time since, but something of the kind having been mentioned in the Journal, I thought it might be generally noticed and adopted.

Curtain Road, E.C., J. R. SUMMERS.
June 28th, 1871.

N.B.—The india-rubber bands might, of course, be applied to any of the new poison bottles.

[*** We believe that Messrs. Maw, Son and Thompson are at present engaged in bringing out a fastening for poison bottles very similar, so far as we can judge, to the arrangement described above.—ED. PHARM. JOURN.]

POISON SAFETY.

Sir,—So much having been written of late respecting the storage, etc. of poisons, one feels somewhat reluctant in throwing out any further suggestion; still, as something will ere long be thrust upon us in reference to the keeping, as well as the dispensing and selling of poisons, whether we, as chemists, like it or no,—I have been induced to suggest what appears to me a very simple, and at the same time a very efficient poison safety, viz. that over the cork or stopper, and also to slip over the neck of every bottle, etc., containing any of the poisons enumerated in schedule A, part 1, of Pharmacy Act, 1868, be placed a RED india-rubber capsule, with rim at bottom, similar to Maw's india-rubber teats, used for feeding-bottles. And that over the stoppers, etc., of bottles containing poisons described in schedule A, part 2, be placed a BLACK india-rubber capsule, thus distinguishing at a glance schedule A, part 1 from part 2. These capsules would be manufactured at a cheap rate, last a considerable time, be easily placed upon, or removed from, the bottles, etc., and obviate the necessity of untying and re-tying every bottle required for use, and I believe might admit of universal adoption.

East Southsea, 22nd June, 1871. F. W. WHEELER.

[*** The capsules proposed by our correspondent would seem to be essentially the same as those introduced by Mr. Baildon, of Edinburgh. They were exhibited by him at the Liverpool meeting of the Conference. See Vol. I. 3rd ser. p. 120.—ED. PHARM. JOURN.]

A Conference Question.

Sir,—The many and varied attractions of Edinburgh and its neighbourhood will doubtless be sufficient to induce many pharmacists to attend the meeting of the Conference in August next.

All those who know the kind feeling prevalent on the other side of the border are fully persuaded that everything which can be done to ensure the success of the meeting, and add to the comfort of the visitors, will meet with the attention of their Edinburgh brethren.

In looking through the prospectus recently forwarded to the members with the invitation to the Conversazione, one cannot help noticing the absence of an arrangement made upon previous occasions with the best results, and to which the unprecedented success of the Liverpool meeting of last year was mainly due.

It is said "that information will be given concerning hotel accommodation."

Would it not be much better to make a special arrangement with a first-class hotel to provide for such a number as would in all probability be present?

The members, then, instead of passing their evenings in small groups in the various hotels of the city, would be enabled to join together in those friendly greetings for which pharmacists when abroad are noted, and thereby carry away with them many pleasant recollections of their last merry meeting. A Conference Man.

[We are unable to add anything further to the circular which has been issued, but we would suggest that our correspondent should communicate with the Local Secretary in Edinburgh.—Ed. Pharm. Journ.]

Druggists' Prices North of the Tweed.

Sir,—If my remarks on the Scotch price list had called forth any reply, I fully expected that it would have taken the form of a challenge, to prove the northern origin of the list in question.

Happily, however, I am relieved from what would, under the circumstances, have been a somewhat difficult task, two correspondents from the North having come forward, the one to repudiate, on behalf of the Glasgow Association, the unique production, the other to avow and defend the anonymous emanation from "your committee."

Admitting my oversight of the note, "All prices exclusive of bottles," in this list, my statement holds none the less good, that fourpence is there entertained as an adequate price for a ℥j mixture (as a rule eight doses of medicine), and so on in proportion through a great part of the dispensing portion. The retail portion is, as I suppose, a more dignified department, made vastly more remunerative.

For admirably-planned dispensing price lists, commend me to those bearing respectively the names of the Manchester and Bath Chemists' Associations, each of which, being based upon a moderately-elevated view of the profession of pharmacy, entertain not fourpence (?) but one shilling as the lowest fee for dispensing a bottle of medicine.

Great efforts will be required to effect anything like a general augmentation of the wretched pittance routine and petty rivalry have assigned the chemist as the price of his labour; and those who look forward to such a consummation will, on inspecting the result of the labours of our Northern reformers (?), find it difficult to repress the exclamation, "Save us from our friends!"

Bradford, June 13th, 1871. R. G. H.

The New Pharmacy Bill.

Sir,—The days of class legislation and protection are virtually ended. The policy of Government is to legislate for the many, regardless of the interests of the few. It is in this spirit that the Bills lately introduced, and still before Parliament, have been framed. The Poisons Bill, it is said, is "intended to protect the lives and health of the public," who, it is also stated, are "supremely indifferent to the subject." The same attitude was assumed in respect of the matchless match-box measure, which, had it not met with a decided condemnation, would have now become a vexatious and unjust law. The axiom "men are but sorry witnesses in their own cause," receives a quiet illustration in the department of the governing powers, and there can be little doubt that a poison Bill of some sort will, ere long, be produced and carried into operation, notwithstanding the objections of 10,000 chemists and druggists.

The only cogent argument that is likely to produce any effect is, that the public are not uninterested spectators of the conflict. I believe that were the following address got up and laid upon the counter of every chemist and druggist in the kingdom, it would be signed by every one of our customers, from the greatest to the smallest, producing an aggregate of signatures amounting to, not tens, but hundreds of thousands, whose confidence in the skill and care of their chemists remains unshaken; and who would not wish to see an intelligent class degraded to the level of publicans, cab-drivers and marine-store dealers.

R. Goodwin Mumbray.

Richmond, S.W., June 27th, 1871.

Proposed Form of Address.

To——.

We, the undersigned, inhabitants of ——, regard with aversion any attempt to interfere with the business of chemists and druggists, as now carried on in these realms, believing that as a body of intelligent men, they possess not only the right, but the ability conscientiously to discharge the duties connected with the sale and art of dispensing medicines of any kind whatsoever, to the safety and advantage of her Majesty's subjects. And etc. etc.

"A Drumstick."—We must refer you to the rule concerning anonymous contributions.

"Ignotus" is recommended to consult a good work on arithmetic.

"Spes."—The question has been answered recently in the "Notes and Queries" column.

R. H. C. N.—You would have to pass the Preliminary Examination.

M. P. C.—We have handed your note to the Board of Examiners, where it will produce more effect than in our pages.

R. O.—It would seem that you must have had some impurity in your ingredients or in the water used.

H. Oldfield.—Legally, we believe, a sweet-wine licence would be necessary, though there may be some uncertainty on the point.

X. Y. Z.—The following formula is given by Squire:—Precipitated Chalk, 1; Spermaceti Ointment, 4; mix.

Botanist—The plant forwarded is *Polygala vulgaris*, with blue and white flowers.

Phyto.—The specimen sent is correctly named by you. We know nothing of the occurrence of *Muscari comosum*.

R. Manlove.—The specimen is very bad, but it is certainly not *Chrysosplenium oppositifolium*. It appears to be *Saxifraga tridactylites*.

"An Old M. P. S."—See an article on the Adulteration of Oils, by Mr. F. C. Calvert, Pharm. Journ. 1st Ser. Vol. XIII. p. 356.

"J. S."—In a case recently reported in this Journal (3rd Ser. Vol. I. p. 775), the Bench held that all tooth-powders came within the meaning of the Act as patent medicines.

T. Cooper.—See a paper by Professor Abel in the Pharm. Journ. 1st Ser. Vol. XVII. p. 556, for methods of treating the suspected paper-hanging, after which, if arsenic be present, it may be detected in the usual manner.

Pilula.—Use manna or the following paste:—

Tragacanth	ʒss	
Glycerine	ʒij	Misce.

A. C. Coles.—You will find a formula for syr. ferri hypophosph. in Pharm. Journ. 2nd ser. Vol. IX. p. 461. Syr. sodæ hypophosph. 3 grs. to the drachm. We do not know that the physician referred to has any special form.

Communications, Letters, etc., have been received from Mr. C. Inch, Mr. P. Squire, Mr. F. M. Rimmington, Mr. G. Brown, Mr. Abbot, Mr. B. Keen, Mr. J. Booth, Mr. R. D. Mitchell, Mr. H. Pocklington, Mr. J. Birt, Mr. R. Palmer, Mr. L. T. Ashwell, A. M., J. S., W. H. B., S. W. N., A. W., "Calyx," "Beta," "Chemicus."

MATCHES.

BY B. S. PROCTOR.

(Concluded from page 21.)

About the beginning of the nineteenth century chlorate of potash, with its wonderful oxygen-yielding power, came to the aid of the match manufacturer, and small sulphur matches, with a tip of chlorate and sugar, were ignited by touching them against the stopper of a phial of oil of vitriol. The matches were usually sold in tin boxes, with a division to hold the phial of acid, the whole being known as a chemical fire-box. Several accidents occurred from leakage of the acid, and consequent ignition of the whole boxful of matches, until the expedient was adopted of putting asbestos into the phial, and only so much acid upon it as it would absorb.

One of these old boxes is labelled thus:—

"WITHOUT PHOSPHORUS.
WATTS'
IMPROVED FIRE BOX
FOR OBTAINING IMMEDIATE
LIGHT.

Directions.—Dip the match sharply into the bottle, and instantly withdraw it.

Anderson's Place, Cornwall Road, London."

The bottle was supplied with asbestos, the chemist being expected to add the oil of vitriol at the time of sale. Matches, upon a modification of the same principle, were afterwards introduced under the name of Prometheans. They consisted of spiral cones of waxed paper, with a drop of a pasty mass of moist chlorate of potash and sugar inserted into the open end of the cone, and immersed in this mass a capillary glass tube, in which a very small portion of oil of vitriol was hermetically sealed. When dry, the match could be ignited by striking the end with any hard body, so as to break the tube, and thus bring the acid in contact with the chlorate. These matches were introduced by a Mr. Jones, of the Strand. They were usually sold in hard turned-wood boxes, and were ignited by holding the tip of the match upon the table and striking it with the bottom of the box. They were, in many respects, very good matches, but were necessarily expensive, being sold (to within the last twenty-five years) at 2*s.* 6*d.* per hundred. They are very permanent; some, which are now more than twenty-five years old, igniting as well as when new.

Besides chlorate of potash and sugar, sulphide of antimony sometimes entered into the composition used in tipping matches for chemical fire-boxes, and it was no doubt a compound of that nature, the precise materials of which, however, I have not been able to ascertain, which led to the production of the friction match, which was first made by Mr. Walker, chemist and druggist, of Stockton, in 1827. He had been making a composition for tipping matches to be used with oil of vitriol. Having stirred the same with a slip of wood, some of the composition adhered to it; this, when dry, he accidentally ignited by striking it against the hearthstone. Thus, a happy accident suggested to him the practicability of making matches which should ignite by friction without the use of oil of vitriol. His matches consisted of thin slips of wood about two inches and a half long and about the thickness of cardboard tipped with his newly-discovered composition.* They were sold in cardboard boxes, containing fifty matches, and a piece of sand-paper for igniting them, the price being a shilling. The sand-paper was folded with the rough surfaces inwards, and the match was ignited by placing the tip between these rough surfaces, and suddenly withdrawing it, while gentle pressure was applied. It is said that Mr. Walker paid three-halfpence apiece for the empty boxes, which were made for him by a bookbinder in Stockton. As this was a very important step in advance, and made by a pharmacist, we may not inappropriately quote the following notices of him.

In Richmond's local records of Stockton and neighbourhood, occurs the following:—

"May, 1, 1857. Died at Stockton, Mr. John Walker, aged 78. He was for many years a druggist at that place, and was the inventor of friction matches, the sale of which he commenced in April, 1827, charging one shilling per box, each box containing fifty lucifers."

A correspondent in the *Newcastle Daily Chronicle* supplies the following from the London *Atlas* newspaper of January 10, 1830, headed "Instantaneous Light":—

"Amongst the different methods invented for obtaining a light instantaneously ought certainly to be recorded that of Mr. Walker, chemist, Stockton-on-Tees. He supplies the purchaser with prepared matches, which are put into tin boxes, but are not liable to change in the atmosphere, and also with a piece of fine glass-paper folded in two. Even a strong blow will not inflame the matches, because of the softness of the wood underneath, nor does rubbing upon wood or any common substance produce any effect except that of spoiling the match; but when one is pinched between the folds of the glass-paper, and suddenly drawn out, it is instantly inflamed. Mr. Walker does not make them for extensive sale, but only to supply the small demand in his own neighbourhood."

"The above," adds the same writer, "is placed under 'Scientific Notices,' and we thus gain a glimpse of the first introduction of lucifer matches to supersede the flint, steel, and tinder-box process. In 1830, and for many years previous, Mr. Walker occupied a small shop at the corner of Dovecot Street, Stockton, and is well remembered in the locality as a gentleman of the old school, dressed in drab breeches and gaiters, and always sporting a particularly clean white apron. Mr. Walker afterwards removed to larger and more prominent premises in the High Street, being next door to Mr. Thomas Jennett, printer. In 1830 these matches were sold at half-a-crown per box, and remained for some time at the above price; but as the demand increased the cost was reduced, and sixpence per box was considered a moderate charge for many years. Those who professed to be 'knowing' upon the subject declared old Walker made a handsome thing out of the discovery, inasmuch as he kept the secret of manufacture as long as possible to himself."

These matches, the tips of which were composed of sulphide of antimony and chlorate of potash,

* Probably it consisted of two parts of sulphide of antimony and one of chlorate of potash made into paste with gum water, this being the composition known to be in use a short time afterwards.

required so much friction for their ignition, that the tips were frequently pulled off or worn off before the match took fire, a fault which was remedied some six or seven years later by the use of phosphorus.

Dr. Moldenhauer and Dr. Boettger are spoken of as amongst the most successful workers in the production of phosphorus matches, the composition used by the latter being as follows:—

	Parts.
Phosphorus	4
Nitre	10
Glue	6
Red Lead	5
Smalt	2

The glue being softened with water, and melted in a warm mortar, the phosphorus was stirred in somewhat in the manner of making an emulsion, the temperature used being (140° F.) a few degrees above the melting-point of phosphorus (108° F.). When these were thoroughly mixed, the nitre and colours were added, and a soft, uniform paste produced, with which the matches were tipped after having been first tipped with sulphur.

Phosphorus does not readily communicate its combustion to wood, probably on account of the phosphoric acid produced condensing upon and protecting carbonaceous or fixed materials from the action of the air; thus arises the necessity for the use of sulphur or some other volatilizable substance which is rendered gaseous and ignited by the heat of the burning phosphorus, and can readily communicate its combustion to the wood.

To avoid the unpleasant smell of sulphurous acid, the sulphur was replaced by wax or stearine in the better qualities of matches; the mode of impregnating the tips of the splints with these substances being to press the end of a bundle of them upon a hot iron plate till the wood began to char, and dipping them while thus heated into a tray of melted wax. Camphor was added to the wax by Mr. Bell.

In 1861, Mr. Letchford patented the use of paraffin for the same purpose, the object being to find a material capable of attaining this end, and sufficiently cheap to be used to the common descriptions of matches.

Chlorate of potash, which was indispensable in the early forms both of dipping and friction matches, was not only not essential, but in some respects disadvantageous in union with phosphorus. Nitrate of potash was found to give a quieter and less explosive combustion. The ease with which the phosphorus compounds ignited enabled manufacturers to use soft materials, which would not have borne the rough usage to which Mr. Walker's original friction matches were necessarily subjected. Thus, wax vestas and fusees of soft brown paper, or amadou impregnated with nitrate of potash, were added to the growing number of varieties.

After the use of phosphorus had been considerably developed, it was found that the operatives exposed to its vapours were frequently attacked with painful swellings and inflammation of the lower jaw, sometimes resulting in mortification and exfoliation of the bone. The disease was known as phosphonecrosis. Though a careful attention to cleanliness and ventilation is enough to prevent the occurrence of this malady, there is no doubt that the great suffering it had inflicted upon some of the workpeople acted as one of the inducements to adopt amorphous phosphorus, when that body was made known by Schrotter. He exposed phosphorus, in closed vessels, to a temperature of about 500° F., and found that it was changed in many of its most prominent qualities. It had become opaque, and of a dark red colour; it had ceased to be volatile and fusible; it had lost its tendencies to undergo slow combustion at low temperatures, and was no longer poisonous. But while it had lost many of the objectionable qualities possessed by phosphorus in its ordinary condition, it had also lost some of the qualities which gave phosphorus an advantage over other materials for match-manufacture,—matches of amorphous phosphorus being more difficult to ignite and burning with a sputtering flame, which qualities have hitherto prevented their coming into general use.

But Dr. Boettger, who had devoted much attention to the improvement of match manufacture, suggested in 1848 that the amorphous phosphorus might be made into a friction surface, to be used for igniting matches, tipped with a chlorate compound not capable of ignition by simple rubbing upon an ordinary rough surface. Attempts to carry out this suggestion were made with partial success by various German and French manufacturers during the years 1854 and 1855; but it was not till Messrs. Bryant and May, in August, 1855, patented a modification of this principle that these "safety matches" attained any popularity in England.

Another form of safety match was introduced in 1859 by Messrs. Devilliers and Dalemagne. Each match was tipped at both ends, one end having the chlorate and the other the amorphous phosphorus, and to ignite them the match was broken in two, and one end rubbed against the other,—an arrangement more fanciful than advantageous.

The consumption of matches has increased enormously since the facilities for their production led to a reduction in their price. About five-and-twenty years ago a witty dealer adopted for his placard the lines at the head of this paper:—

"O, Lucifer! how art thou fallen!
Only one penny per box!"

Lucifer has continued to fall ever since, and yet we may say almost all varieties of lucifers are above the price of rubies—Bryant and May's "Rubies;" red-tipped matches of a very cheap quality, being sold at 2*s.* 6*d.* per gross of boxes. This price, low as it is, is not more surprising than the great number produced,—the above firm making daily no less than 1250 gross of boxes of this quality alone, that is about thirteen millions of matches per day.

It might be supposed that, with so great a production and so small a price, there was not scope for further progress in this manufacture; yet the very magnitude of the craft gives a prospect of ample remuneration to any one who can devise an improvement in the quality or greater economy in any department of the work. Various suggestions have been made which have not yet been carried out, but some of which will no doubt afford a handsome profit to any one, be he chemist or manipulator, who finds the means of making them practically available. For example, the proportion of phosphorus formerly used was about one-seventh of the tipping composition, but has been considerably reduced by being more finely divided; and it is said that, by dissolving the phosphorus in bisulphide of carbon, it may be reduced to $\frac{1}{300}$th of the quantity now commonly employed; and Wiederhold has shown that, in the experimental scale at least, good matches may be made with chlorate of potash and hyposulphite of lead, without the use of phosphorus at all.

TESTING PETROLEUM.

BY PROFESSOR ATTFIELD.

In ascertaining the temperature to which a specimen of petroleum must be warmed before its vapour can be ignited, different experimenters obtain different results. The fact is this "flashing-point" varies according to circumstances; unless, therefore, two operators work under exactly similar conditions, their reports will not coincide. In the British Petroleum Act of 1868 somewhat minute directions for applying the flashing test to samples of petroleum are given in a schedule. As originally drawn up, those directions were supplied to the Government by Mr. Abel, Dr. Letheby and myself, and related to the testing of the liquid when contained in a three-inch half-filled cup. After they left our hands, they were made to apply to petroleum contained in a two-inch full cup; the protection from draughts afforded to the surface of the liquid by the upper part of the half-filled cup being substituted by that of a screen so placed round the full cup, that the efficiency of the original directions should not be affected. That is to say, a sample of petroleum flashing at 100° in the unscreened half-filled cup should flash at 100° in the screened full cup. This should be borne in mind by all persons testing petroleum, as the screen can be so constructed or so arranged as to cause flashing-points to be above or below the standard now given. Just before the Act passed, I pointed out to the Government that the alteration would lead to endless disputes, and was assured by letter (which I still possess) that the construction of the apparatus was only varied in a point of detail to meet an objection; that, in short, the screen was to be so efficiently disposed as not to interfere with the standard previously fixed. I may add that one year later (June 1869) in a Bill for consolidating and amending the Petroleum Acts of 1862 and 1868, this standard was maintained with the concurrence of the wholesale and retail petroleum traders, a *covered* screen (which gives results similar to those obtained in the half-filled cup) being directed to be employed. It is to be hoped that this standard, which has been accepted by all parties interested in the sale of mineral oils, will rigidly be adhered to in any attempt at further legislation respecting these liquids. In a Bill now (June 1871) before Parliament, the oils are directed to be tested in a *covered cup*, and the defining clause describes "petroleum" as being a certain liquid giving off inflammable vapour below 85° Fahrenheit. It is to be expected that this is the exact equivalent of the foregoing standard—that petroleum flashing at 85° in the closed vessel would flash at 100° in the open vessel. If not, one section or other of oil traders will probably prevent the maturation of the Bill; a result to be avoided if possible, for fresh legislation is sorely needed. My own testing apparatus is so constructed as to give results such as just indicated, results which I believe to be in exact accordance with the intentions of the Legislature. I may state, shortly, that it is a modification of what is known in trade as "Miles's instrument," with a screen five inches high; no cover to the screen, and with the front third of the smoke-holes of the outer casing permanently closed. The removal of the cover of the screen produces no difference in the flashing-point of a sample of petroleum, the walls of the screen being sufficiently high to protect the cup from draughts in an ordinary room; still I operate without it, to avoid objections that might be raised against the apparatus in a court of law, no special mention of a cover to the screen being made in the Petroleum Act (1868). I close up the front "smoke-holes" (as I have called the holes through which escape the products of combustion of the flame that heats the water-bath), in order to avoid a slight inconstancy of results caused possibly by draughts from these apertures. Miles's instrument, as sold to the public, gives results which are close to those I obtain by the slight modification I have described but the latter gives me those results with greater constancy and certainty.

17, *Bloomsbury Square.*

CLEARING NUTS.

(*Strychnos potatorum.*)

BY M. C. COOKE, M.A.

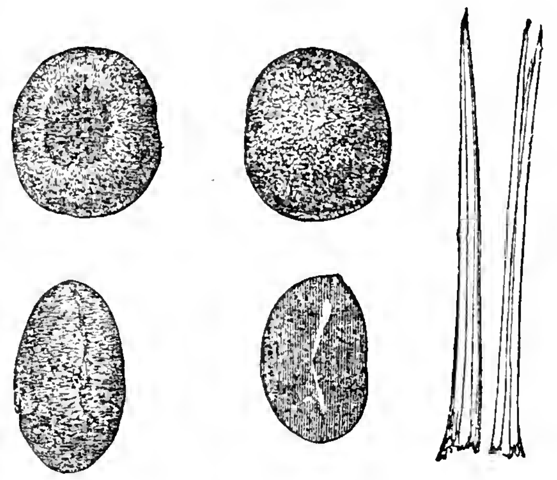
The clearing nuts of India are the produce of a tree which is described as larger than that of the nux vomica. It is without thorns or tendrils; leaves very shortly petioled, elliptic, acute, glabrous, membranaceous, five- and almost penninerved; corymbs axillary, opposite, shorter than the leaf; corolla hirsute within; berry one-seeded; flowers greenish-yellow, fragrant. It is found on the Coromandel coast, the Concans and the western Ghauts, flowering in April.

The native names given by Moodeen Sheriff are,—*Nirmali*, Hindustani, Bengali and Gujerati; *Chilbinj*, Dukhni; *Tetran Kottai*, Tamul; *Chilla-gingalu*, Telugu; and *Tetran-parala*, Malayalim.

The fruit, says Ainslie, when very young, is made into a preserve and eaten, but is reckoned, in its mature state, amongst the emetics of the Tamul doctors of southern India, given in powder in the quantity of about half a teaspoonful. The dried seeds are used for the purpose of clearing muddy water, one of them being usually rubbed hard for a short time round the inside of the earthen pot; the water is afterwards poured into it, and left to settle. The impurities soon subsiding, the water will be found clear, tasteless, and wholesome. Roxburgh adds that the natives never drink clear well-water if they can get pond or river water, which is always more or less impure, according to circumstances. These seeds are therefore constantly carried about by the more provident part of our officers and soldiers in time of war, to enable them to purify their water. They are easier obtained than alum, and probably less hurtful.

The tree grows to a larger size than the nux vomica, and is not so common, being only found amongst mountains and woods of great extent, flowering during the hot season. The berry is shining, and black when ripe, containing only one seed, whereas that of nux vomica is many-seeded. (See

Pharm. Journ. 1st ser. Vol. IX.) Roxburgh says that the wood is hard and durable, and is used for various economical purposes. The seed is broadly lenticular, about half an inch in diameter and a quarter of an inch in thickness; of a dirty whitish-grey colour, and covered with a thick coating of delicate appressed hairs. These hairs are in bundles of from three to six, agglutinated together longitudinally; but when separated each hair is seen to be a simple, pointed, cylindrical cell. To the naked eye, the surface of the seeds appears to be mealy rather than hairy.



Seeds of *Strychnos potatorum*, nat. size; hairs magnified 60 diameters.

The seeds in powder, mixed with honey, are applied to boils to hasten suppuration; also with milk in sore eyes. When used as an emetic in southern India, the seeds are given in powder. Dr. Kirkpatrick says that the seeds are employed as a remedy in diabetes; and they are mentioned in the Taleef Shereef as useful in gonorrhœa, etc. Their chief use, however, consists in their application to the clearing of muddy water.

Dr. Pereira* suggested that the peculiar property of these seeds depends "on the presence of albumen and casein in the seeds, which act as fining agents, like those employed for wine and beer. If the seeds be sliced, and digested in water, a thick mucilaginous, ropy liquid is obtained, which, when boiled, yields a coagulum. If this be removed, a further coagulum is obtained by the addition of acetic acid. These reactions show the presence of albumen and casein." Dr. O'Shaughnessy suggested that the clearing action depends on astringency in the fruit, which Dr. Pereira considers insufficient.

Other seeds are employed in other countries for like purposes; and Niebuhr states, in his 'Travels through Arabia,' that the inhabitants of Cairo, in Egypt, render the muddy water of the Nile quite clear by rubbing bitter almonds, prepared in a particular manner, on the inside of the earthen jars in which the water is kept.

It is not so much the seed as the pericarp that commends itself to our notice. The former is not employed medicinally, whilst the latter is in common use amongst the natives as an emetic.

The use of the fruit as an emetic seems to have been wholly confined to the native practitioners. It has been supposed that the reason why it has never acquired repute is the improper way in which it is administered. The whole fruit is generally powdered, and given in about half a teaspoonful doses. It is not surprising, therefore, that failure should take place, since the large seeds are not emetic, the dry pulp of the fruit and the pericarp alone possessing that property. If these are used separately, the result is said to be very satisfactory.

When sold separately, the emetic portion of the fruit is found in the bazaars in two conditions. In one condition it is in thin, scaly, and shell-like pieces, which are shining externally, and of a greenish- or yellowish-brown colour. This is the pericarp removed when the fruit is dry. In the other condition it is formed together with the mucus into large balls or masses weighing about one pound. In this condition it contains a large quantity of dry mucus, and is much superior in action to the other form. Mr. Moodeen Sheriff states that the dry mucus appears to be more efficacious in dysentery than ipecacuanha.

The dose of the simple powder of the pericarp, prepared in the usual way, and kept in a stoppered bottle, is from 40 to 50 grains as an emetic, and from 15 to 30 in dysentery.

[N.B.—This article was in type before that quoted from the *American Journal of Pharmacy* at p. 23 had appeared; but its publication had been delayed on account of the woodcut.—Ed. Pharm. Journ.]

* Pharm. Journ. 1st Series, Vol. IX., pp. 477, 478.

FLUID EXTRACTS AND THEIR MENSTRUA.

BY EDWARD R. SQUIBB, M.D.

(*Continued from page* 25.)

This process of repercolation has been described in previous papers, but it may be useful here to offer a table of examples, carried out to an exaggerated extent, to exhibit its scope and capacity; and yellow cinchona, dandelion, and senna are selected for illustration. All these drugs were taken in the very fine powders as met with in the markets. One Pharmacopœia portion of 7680 grains of each was taken for each percolation, and three percolations of each drug were made. The percolate from the first portion of each was taken to moisten and percolate the second, and the percolate from the second portion of each was taken to moisten and percolate the third.

The menstruum used for yellow cinchona was a mixture of one part, by weight, of glycerine, and three parts, by weight, of stronger alcohol. That used for the senna was diluted alcohol, and that used for the dandelion was a mixture of equal weights of stronger alcohol and water. The yellow cinchona and dandelion were each moistened with 8 f℥, of menstruum and percolate, and the senna with 9 f℥. All the moistened powders were passed through a sieve before packing, and were packed and managed alike, each pint as it came from one funnel being poured on top of the other.

It will be seen by reference to the first table that it is estimated that the Pharmacopœia *may* get in yellow cinchona 55 per cent. of the extract from the bark, or 866 grains in the two pints. By the last cinchona column of the table of repercolations it will be seen that if the first four pints from the third portion be mixed together, each pint of the mixture will contain almost as much extract of cinchona as the officinal two pints, and the whole four pints will make, by adding the next four pints of the column, eight pints, having nearly the strength of the officinal preparation, and this from three portions of powder.

If the fluid extract of cinchona be changed in the new Pharmacopœia to double the present officinal strength, and the standard for percolation be unchanged, then this column would yield about $2\frac{1}{2}$ pints of double the present officinal strength. But if the standard be increased so that the preparation shall contain 80 per cent. of the extract, or 1244 instead of 866 grains, then the first pint of the column is not strong enough, and another portion must be percolated with the percolate from the third portion. This portion may be larger or smaller than the others in proportion to the wants of the operator, and

TABLE OF REPERCOLATIONS.

Portion of Percolate.	YELLOW CINCHONA BARK. Grains.						DANDELION ROOT. Grains.						SENNA LEAF. Grains.					
	1st Portion.		2nd Portion.		3rd Portion.		1st Portion.		2nd Portion.		3rd Portion.		1st Portion.		2nd Portion.		3rd Portion.	
Pints.	Difference.	Extract.	Difference.	Extract.	Difference.	Extract.	Difference.	Extract.	Difference.	Extract.	Difference.	Extract.	Difference.	Extract.	Difference.	Extract.	Difference.	Extract.
1	398	514	587	757	765	988	808	1927	1484	3539	1624	3874	563	1166	841	1742	1098	2275
2	155	200	280	361	493	636	374	892	676	1612	1000	2385	286	593	485	1005	878	1819
3	70	90	230	297	321	414	169	403	298	711	704	1679	103	213	258	535	370	767
4	48	62	195	252	260	336	119	284	156	372	405	966	46	95	169	350	289	599
5	53	68	135	174	193	249	53	126	125	299	234	558	47	98	132	274	229	475
6	26	34	94	121	175	226	31	74	97	231	161	384	36	75	100	207	145	301
7	28	35	87	112	183	236	8	19	102	243	137	327	34	71	65	135	128	265
8	65	84	112	145	182	235	7	17	95	226	112	267	31	64	51	106	110	228
9	95	123	86	111	168	217			75	179	95	228	18	37	45	93	113	235
10	71	92	87	112	153	197			57	136	80	191	23	48	34	70	100	207
11	31	40	65	84	134	173					66	155	2	4	42	87	94	192
12	30	39	48	62	106	137					43	103	4	8	48	99	75	156
13	26	34	38	49	91	118									39	81	68	141
14	14	18	47	61	101	130									33	68	48	99
15	32	41	41	53	71	91												
16	25	32	45	58	83	107												
17	38	49	40	51	48	62												
	1205	1555	2217	2860	3527	4552	1569	3742	3165	7548	4661	11,117	1226	2540	2342	4852	3745	7759

will yield accordingly, the larger portions being more economical.

In the case of dandelion (should not the Pharmacopœia change the English name to taraxacum ?) the Pharmacopœia is estimated to get 86 per cent. or 3222 grains of the extract in its pint. This would make the first two pints of the last dandelion column nearly officinal. But if the standard be reduced to the 80 per cent. uniformity, or 2993 grains instead of 3222 to the pint, the column would yield nearly 2½ pints of that strength.

In the case of senna, the Pharmacopœia, as estimated, may get 78 per cent. or 1972 grains of the extract in its prescribed pint of fluid extract. The last senna column of the table would yield about 2¼ pints of this strength. But if the standard be increased to 80 per cent., or 2032 grains of extract to the pint, the column would yield just 2 pints of this strength.

Of course the weaker percolates of these final columns of this table yield proportionately more when applied to other fresh portions of powder, but in some instances at least, if not in all, repercolation cannot be carried on indefinitely, because of the weak percolate becoming overloaded with extract—the 20 per cent. which is rejected and goes on accumulating—which is assumed here to be medicinally feeble. After a year or two of active practice, it becomes necessary to recover the alcohol from the weaker of the weak percolates, only carrying on the stronger ones. In no case need each separate portion of the residuary weak percolate be kept separate from one making to the next, but the different strengths may be grouped together so as to preserve the whole in three or four bottles for each substance.

From the above considerations it would follow that a fluid extract representing a drug minim for grain, might be defined or described as a solution containing 80 per cent. of the extract of that drug, which is soluble in a given prescribed menstruum. And fluid extract of senna, for example, would be powdered senna repercolated with diluted alcohol until equal volumes of the menstruum and percolate weighed at the same temperature, differ to the extent of 14·5 per cent. = 988 grains to the pint.

The menstrua for fluid extracts need much revision and much research, for upon the menstruum a large part of the therapeutical as well as pharmaceutical success depends. The writer has only very imperfectly studied this branch of the subject, and yet too much time and space would be required to give an abstract of the observations made. He must therefore be content with offering his judgment as based on his experience.

The officinal "alcohol," defined as "spirit of the specific gravity 0·835," seems to be no longer needed in the Pharmacopœia, its place having been well taken by the common so-called "95 per cent. alcohol," or "alcohel fortius" of the Pharmacopœia. This might now be called in the Pharmacopœia, as it is in the market, simply alcohol. Since the last revision of the Pharmacopœia the Government has taken charge of the spirit market, and one result of legislation upon it has been to reduce the strength of the market grades. Ten years ago it was easy to get the so-called "95 per cent. alcohol" and "cologne spirit" from any good maker, containing 92 per cent., or of the officinal specific gravity 0·817. But of late years, in the writer's experience, this is always difficult and generally impossible. In a review of some fifty barrels or more from several good makers, including "Atwood's Alcohol," at various times within the past year, and all bought to special order, and not in the general market, the specific gravity has only once reached ·817, all the others varying between ·818 and ·824 with an average of about ·820. A ten-gallon keg bought in the common market, of a first-rate house, and with the brand of a good maker on it, stamped by the United States Revenue officer as containing "10 wine gallons," "Proof 188," contained 8 gallons and 7 pints, yet gave no evidence of leakage, and had a specific gravity of ·82058. This probably fairly represents the market at the present day, and if so, 91 rather than 92 per cent. should be aimed at by the Pharmacopœia.

Some reform in the mercantile management of alcohol is much needed, and the influence of this Association might be used to bring this about at an earlier day than it would naturally come through popular demand. When the so-called "95 per cent. alcohol" sold for 40 to 45 cents per gallon, the "shortage" of half a gallon or a gallon on each barrel was of far less moment than it is now with a price of $2, or thereabouts; and the difference of temperature between summer and winter,—or between 10° C. = 50° F., and 30° C. = 86° F.—of a fraction over 2 per cent. in the measuring, was also of less moment. Either through erroneous gauging, or through some skill in making barrels, or through both together, it is very rare to find a barrel of alcohol that holds out measure even in summer temperatures, and the rule is that they fall short from half a gallon to one and a half gallons to the barrel, while of late years the writer never knew a barrel to overrun the gauge. And as the United States Inspector's certificate always certifies the gauge, the alcohol-maker throws himself upon this, and there is no redress. Besides this there can be nothing more clumsy, nor more difficult to comprehend in common usage, than the plan of defining the strength by degrees above and below proof, and the quantity by proof gallons. If it was desirable to keep the consumers or users of alcohol so befogged that they could not detect deficiencies in strength or measure, hardly a better plan could be adopted, and the advisers or experts of the General Government, who are responsible for the present method, could not have better subserved the interests of the Whisky Ring, or damaged the interests of the consumer had they been paid for it.

The strength should always be indicated by percentage of absolute alcohol *by weight* and not by volume, and this should be determined by apparent specific gravity.

It should always be bought and sold by weight, the barrels being tared, just as castor oil, linseed oil, cotton-seed oil, etc., are of late years.

Five gallons alcohol, specific gravity ·8202 at 15·6° C. = 60° F., measured at 21° C. = 69·8° F., weighs 34 lbs. avoirdupois, or nearly 6 lbs. 13 oz. to the gallon. This alcohol contains about 91 per cent. by weight of absolute alcohol.

The officinal alcohol fortius, specific gravity ·817, containing about 92 per cent. of alcohol by weight, if measured at 15·6° C. = 60° F., weighs just about the same. So that about 5·4° C. = 9·8° F. of temperature, is equal to 1 per cent. in strength.

If bought and sold by weight, or by weight gallons, which would be the first step, temperature would not have to be taken into consideration.

Alcohol of specific gravity ·81674 at 15·6° C. = 60° F., when weighed at 25° C. = 77° F., has an *apparent* specific gravity of ·808767, and at 30·6° C. = 87° F., ·80400, or about ·00085 for each Centigrade degree of temperature. By apparent specific gravity is meant that although the alcohol is weighed at the higher temperature given, it is compared with the same volume of water at the lower temperature of 15·6° C. = 60° F.

One pint of this alcohol, officinal "alcohol fortius,"

at 10·6° C. = 51° F.	weighs	387·72 gram.	= 5983	grains.
at 30·6° C. = 87° F.		379·87 „	= 5862	„
20° C. = 36° F.		7·85 „	= 121	„

Alcohol of specific gravity ·82154 at 15·6° C. = 60° F. when weighed at 25° C. = 77° F. has an *apparent* specific gravity of ·81342, and at 30·6° C. = 87° F., ·80889, or about ·000843 for each Centigrade degree of temperature. One pint of this alcohol, which is about the common commercial strength,

at 15·6° C. = 60° F.	weighs	388·05 gram.	= 5988	grains.
at 25·6° C. = 78° F.		384·15 „	= 5928	„
10° C. = 18° F.		3·90 „	= 60	„

The next alcoholic menstruum which the writer has found necessary thus far, is a mixture of equal parts, by weight, of stronger alcohol and water. This mixture rejects much more of the troublesome mucilaginous portions of such drugs as dandelion than the diluted alcohol does.

Equal weights of alcohol specific gravity ·81953 at 15·6° C. = 60° F., and water, give a mixture having a specific gravity

at 15·6° C. = 60° F. ·92858.
at 25° = 77° F. ·92003. Difference, ·00089 for each 1° C.

One pint of this mixture

at 10·6° C. = 51° F.	weighs	439·93 grm.	= 6789	grains.
at 30·6° C. = 87° F.	„	433·03 „	= 6682	„
20° C. = 36° F.		6·9 „	= 107	„

(*To be continued.*)

DUST AND SMOKE.

BY PROFESSOR TYNDALL.

(*Concluded from page* 28.)

We have thus been led by our first unpractical experiments into a thicket of practical considerations. In taking the next step, a personal peculiarity had some influence upon me. The only kind of fighting in which I take the least delight is the conflict of man with nature. I like to see a man conquer a peak or quench a conflagration. I remember clearly the interest I took twenty years ago in seeing the firemen of Berlin contending for mastery with a fire which had burst out somewhere near the Brandenburger Thor; and I have often experienced the same interest in the streets of London. Admiring as I do the energy and bravery of our firemen, and having heard that smoke was a greater enemy to them than flame itself, the desire arose of devising a fireman's respirator. But before I describe what has been done in this direction, let me draw your attention to the means hitherto employed to enable a man to live in dense smoke. Thanks to the courtesy of Captain Shaw, I am enabled to show you the action of the "smoke-jacket," known abroad as the "Appareil Paulin," from its supposed inventor. The jacket is of pliable cowhide. It has arms and a hood, with eye-glasses. With straps and buckles the jacket is tied round the wrists and waist, and a strap which passes between the legs prevents it from rising. On the left side of the jacket is fixed a screw, to which the ordinary hose of the fire-engine is attached, and through the hose air instead of water is urged into the space between the fireman's body and the jacket. It becomes partially inflated, but no pressure of any amount is attainable, because the air, though somewhat retarded, escapes with tolerable freedom from the wrists and waist. Hence the fireman, when his hose is long enough, can deliberately walk into the densest smoke or foulest air. But you see the use of the smoke-jacket necessitates the presence of several men; it also implies the presence of an engine. A single man could make no use of it, nor indeed any number of men without a pumping engine. Its uses are thus summed up in a communication addressed to me by Captain Shaw:—

"This smoke-jacket is very useful for extinguishing fires in vaults, stopping conflagrations in the holds of ships, and penetrating wells, quarries, mines, cesspools, etc.—any places, in short, where the air has become unfit for respiration.

"The special advantages of this jacket are its great simplicity, its facility for use, and the rapidity with which it can be carried about and put on; but its drawback is, that it requires the use of an engine or air-pump, and, consequently, is of no service to one man alone. For this latter reason smoke-jackets, although very effective for enabling us to get into convenient places for extinguishing fires, have very rarely proved of any avail for *saving life*."

Now it is that very want that I thought ought to be supplied by a suitable respirator. Our fire-escapes are each in charge of a single man, and I wished to be able to place it in the power of each of those men to penetrate through the densest smoke into the recesses of a house, and there to rescue those who would otherwise be suffocated or burnt. I thought that cotton-wool, which so effectually arrested dust, might also be influential in arresting smoke. It was tried; but, though found soothing in certain gentle kinds of smoke, it was no match for the pungent fumes of a resinous fire, which we employ in our experiments in the laboratory, and which, I am gratified to learn from Captain Shaw, evolves the most abominable smoke with which he is acquainted. I cast about for an improvement, and in conversing on the subject with my friend Dr. Debus, he suggested the use of glycerine to moisten the wool, and render it more adhesive. In fact, this very substance had been employed by the most distinguished advocate of the doctrine of spontaneous generation, M. Pouchet, for the purpose of catching the atmospheric germs. He spread a film of glycerine on a plate of glass, urged air against the film, and examined the dust which stuck to it. The moistening of the cotton-wool with this substance was a decided improvement; still the respirator only enabled us to remain in dense smoke for three or four minutes, after which the irritation became unendurable. Reflection suggested that in combustion so imperfect as the production of dense smoke implies, there must be numerous hydrocarbons produced which, being in a state of vapour, would be very imperfectly arrested by the cotton-wool. These in all probability were the cause of the residual irritation; and if these could be removed, a practically perfect respirator might possibly be obtained.

I state the reasoning exactly as it occurred to my mind. Its result will be anticipated by many present. All bodies possess the power of condensing in a greater or less degree gases and vapours upon their surfaces; and when the condensing body is very porous, or in a fine state of division, the force of condensation may produce very remarkable effects. Thus, a clean piece of platinum-foil placed in a mixture of oxygen and hydrogen so squeezes the gases together as to cause them to combine; and if the experiment be made with care, the heat of combination may raise the platinum to bright redness, so as to cause the remainder of the mixture to explode. The promptness of this action is greatly augmented by reducing the platinum to a state of fine division. A pellet of "spongy platinum," for instance, plunged into a mixture of oxygen and hydrogen, causes the gases to explode instantly. In virtue of its extreme porosity, a similar power is possessed by charcoal. It is not strong enough to cause the oxygen and hydrogen to combine like the spongy platinum, but it so squeezes the more condensable vapours together, and also acts with such condensing power upon the oxygen of the air, as to bring both within the combining distance, thus enabling the oxygen to attack and destroy the vapours in the pores of the charcoal. In this way, effluvia of all kinds may be virtually burnt up, and this is the principle of the excellent charcoal respirators invented by Dr. Stenhouse. Armed with one of these, you may go into the foulest-smelling places without having your nose offended. Some of you will remember Dr. Stenhouse lecturing in this room with a suspicious-looking vessel in front of the table. That vessel contained a decomposing cat. It was covered with a layer of charcoal, and nobody knew until told of it what the vessel contained.

I may be permitted in passing to give my testimony as to the efficacy of these charcoal respirators in providing warm air for the lungs. Not only is the sensible heat of the breath in part absorbed by the charcoal, but the considerable amount of latent heat which accompanies the aqueous vapour from the lungs is rendered free by the condensation of the vapour in the pores of the charcoal. Each particle of charcoal is thus converted into an incipient ember, and warms the air as it passes inwards.

But while powerful to arrest vapours, the charcoal respirator is ineffectual as regards smoke. The particles get freely through the respirator. In a series of them tested downstairs, from half a minute to a minute was the limit of endurance. This might be exceeded by Faraday's method of emptying the lungs completely, and then filling them before going into a smoky atmosphere. In fact, each solid smoke particle is itself a bit of charcoal, and carries on it, and in it, its little load of irritating vapours. It is this, far more than the particles of carbon themselves, that produces the irritation. Hence two causes of offence are to be removed: the carbon particles which convey the irritant by adhesion and condensation, and the free vapour which accompanies the particles. The moistened cotton-wool I knew would arrest the first, fragments of charcoal I hoped would stop the second. In the first fireman's respirator, Mr. Carrick's arrangement of two valves, the one for inhalation, the other exhalation, are preserved. But the portion of it which holds the filtering and absorbent substances is prolonged to a depth of four or five inches. On the partition of wire gauze at the bottom of the space which fronts the mouth, is placed a layer of cotton-wool, moistened with glycerine; then a thin layer of dry wool; then a layer of charcoal fragments; a second thin layer of dry cotton wool, succeeded by a layer of fragments of caustic lime. The succession of the layers may be changed without injury to the action. A wire-gauze cover keeps the substances from falling out of the respirator. In the densest smoke that we have hitherto employed, the layer of lime has not been found necessary; in a flaming building, indeed, the mixture of air with the smoke never permits the carbonic acid to become so dense as to be irrespirable. But in a place where the gas is present in undue quantity, the fragments of lime would materially mitigate its action.

In a small cellar-like chamber downstairs, with a stone flooring and stone walls, the first experiments were made. We placed three furnaces containing resinous pine-wood, lighted the wood, and placing over it a lid which prevented too brisk a circulation of the air, generated dense volumes of smoke. With our eyes protected by suitable glasses, my assistant and I have remained in this room for half an hour and more, when the smoke was so dense and pungent that a single inhalation through the undefended mouth would be perfectly unendurable; and we might have prolonged our stay for hours. Having thus far perfected the instrument, I wrote to Captain Shaw, the chief officer of the Metropolitan Fire Brigade, asking him whether such a respirator would be of use to him. His reply was prompt; it would be most valuable. He had, however, made himself acquainted with every contrivance of the kind in this and other countries, and had found none of them of any practical use. He offered to come and test it here, or to place a room at my disposal in the City. At my request he came here, accompanied by three of his men. Our small room was filled with smoke to their entire satisfaction. The three men went successively into it, and remained there as long as Captain Shaw wished them. On coming out they said that they had not suffered the slightest inconvenience; that they could have remained all day in the smoke. Captain Shaw then tested the instrument with the same result. From that hour the greatest interest has been taken in the perfecting of the instrument by Captain Shaw himself. He has attached to the respirator suitable hoods. The real problem is practically solved, and I can only say that if a tithe of the zeal, intelligence and practical skill were bestowed on the cotton-wool respirator that Captain Shaw has devoted to the fireman's respirator the sufferings of many a precious life might be spared, and its length augmented.*

The lecture was concluded as follows:—"Thus have we been led from the actinic decomposition of vapours

* Mr. Ladd has also proposed a form of mouthpiece which promises well, and Mr. Cottrell has attached to it an ordinary fencing-mask. This will probably be the form of apparatus finally adopted.

through the tails of comets and the blue of the sky to the dust of London, from the germ theory of disease down to this fireman's respirator. Instead of this trivial example I could, if time permitted, point to others of a more considerable kind in illustration of the tendency of pure science to lead to practical applications. Indeed, those very wanderings of the scientific intellect which at first sight appear utterly unpractical, become in the end the wellsprings of practice. Yet I believe there is a philosophy embraced by some of our more ardent thinkers (who, I fear, on many points commit the well-intentioned, but fatal mistake of putting their own hopeful fancies in the place of fact) that would abolish these wanderings of the intellect and fix it from the outset on practical ends alone. I do not think that that philosophy will ever make itself good in the world, or that any freedom-loving student of nature could or would tolerate its chains."

A short time before the lecture I had an opportunity of inspecting the apparatus of Mr. Sinclair, which has been tested and highly spoken of by the superintendent of the Manchester Fire Brigade. The original idea is due to Von Humboldt, who proposed it for the Hartz mines. Galibert constructed the apparatus in an improved form, and it has been still further improved by Mr. Sinclair, who has purchased Galibert's patent. It consists of an air-tight bag, from which issue two tubes that unite on a single one with a respirator mouthpiece. The bag is filled with air, and the wearer inspires through one valve and expires through another. The expired breath is carried to the bottom of the bag, and is stated to remain there in consequence of the chilling experienced in its passage downwards. A bag of not inordinate size is stated to be sufficient to supply a man with air for twenty minutes. Mr. Sinclair's apparatus was exhibited during the lecture.

J. T.

SUPPOSITORIES.

AN INAUGURAL ESSAY, BY F. M. GOODMAN.

(*Continued from page* 27.)

Preparation.—Several years ago it was customary to mould a cone of some vehicle, then bore a hole into its base, and into this opening was inserted the medicinal substance; the opening was then closed by pouring in a little melted vehicle and smoothing off with a spatula. But in boring these holes there is danger of cracking the cone. A much better and far less troublesome method, is to fill the mould with melted vehicle, and when it has begun to *set*, or has formed a thin coating on the inside of the mould, the still liquid portion may be poured out, and a very perfect hollow cone is the result. These cones may be kept on hand, and any substance prescribed can be inserted, and the openings closed as above mentioned.

When the material to be used as a vehicle is melted, it should never be put into the dish in large pieces, for such a prolonged application of heat is necessary to melt them that the substance becomes unnecessarily hot, and consequently requires a considerable time to cool. The best way is to have the material as finely divided as possible. To *cut* it into small pieces, or to *scrape* it, is rather difficult, but the following plan will be found very expeditious, and has the desired effect, viz. Take a plane, such as carpenters use, invert it, letting it be at rest; spread a piece of paper under it, and "cocoa-butter the plane and not plane the cocoa-butter." Having on hand a supply of this shaved material, be it either cocoa-butter and spermaceti, or suet, the necessary quantity is weighed and placed in a dish, and a very slight heat is employed —just enough to render it fluid.

As generally prepared, the medicinal ingredients are intimately mixed throughout the entire mass, which should be perfectly free from lumps, to prevent the accumulation of which is the most difficult part of the operation.

In preparing suppositories it is always best, in the experience of the writer, to use two dishes—one in which to melt the vehicle, and the other to be used for mixing the medicinal ingredients, as extracts, or other substances that may have been ordered. The latter vessel also is to receive the melted vehicle added in small portions from the other dish. If the vehicle is too warm when mixed with the solution of the extract, the extract will separate. This difficulty may be overcome by setting the dish in cold water and stirring constantly till the mixture becomes thick, by which time it is usually smooth. When the remainder of the warm vehicle is added it will raise the temperature of the cooled portion, in doing which its own temperature will be diminished, and the whole will be smooth and uniform. When it has cooled sufficiently, indicated by its consistence, which should be that of honey, it may be poured into the moulds.

In making urethral suppositories, the writer has found the following to be a rather difficult method, though recommended by some. It is certainly less convenient than moulding in a glass tube: Take a sufficient quantity of the shaved material, place in a dish and heat enough to render it a *little soft* (without melting it)—about the consistence of paste. This can also be done in a warm mortar, which, being very thick, will retain the heat for a considerable length of time; enough of the substance may be removed to make one or two suppositories, and the remainder will retain its soft condition while left in the warm mortar. While the substance is in this semi-solid condition, remove it from the dish or mortar to a board about twelve inches wide, divided into two-inch spaces. The board is constructed on the principle of a pill-machine, having strips on either side, so arranged that they may be replaced by strips of other sizes, according to the diameter desired for the finished suppository, which varies from one to three-sixteenths of an inch. There is also provided a flat piece of wood for a roller. The material is placed upon the board, and rolled out as in rolling pills, into pieces which may be twelve inches long, if the operation be successfully conducted. The rolled mass is then divided into equal parts according to the two-inch marks upon the board.

The difficulty in this process is that the substance is not very tenacious, and upon cooling cracks and crumbles beneath the roller, though one or two may be rolled at a time very readily.

When the urethral suppository is moulded in the funnel-tube, the method adopted to remove the moulded mass is to get the tube *very* cold, so that a little pressure with the piston will expel it, or, to get it thoroughly chilled, then to dip it into water warmed to about 85° or 90° F., and removing it from the water, to apply pressure by the piston; when two inches are expelled, cut it off, and expel two inches more, etc. When cut off, the pieces may be laid gently on a piece of paper, or allowed to drop into cold water.

In order to fill this tube, the lower end must be closed, which may be done by dipping it into the melted vehicle, placing the finger over the upper orifice, and then holding the lower end in cold water. The substance within the end will congeal and prevent the egress of the liquid portion subsequently added.

In using the metallic moulds, it is a source of great annoyance to have the suppository stick fast to the mould, which is invariably caused by not having the mould cold when filled. This is an extremely essential point. The tray should be filled with ice and water, and allowed to stand a few minutes before using, in order that the mould may become thoroughly chilled.

In an article written by Mr. J. B. Moore, which appeared in the *American Journal of Pharmacy*, vol. 40, page 226, he considers it in accordance with a good product to have the moulds dusted with lycopodium, arrowroot, or other similar substance, as *well* as being chilled, and this *may* be essential if the moulds are *never cleaned*, but is certainly not, as he has probably observed, if they are properly polished. A mould, after having been used five or six times, should be well cleaned with powdered pumice, then polished with whiting, and this *must* be done if we expect a good product.

In making extract of opium suppositories, some powder the extract, in order to do which it has to be perfectly dry, and in drying it loses from 5 to 15 per cent. of moisture, which necessarily increases its strength. The writer, however, prefers reducing this extract, as well as most others, to a thin consistence with water, which in the amount necessary is unobjectionable. Sometimes glycerine is better.

Elm is frequently prescribed in the form of a suppository for its emollient effect, and may be incorporated in the following manner: Cut the elm into small thin strips, macerate for half an hour in hot water, strain through muslin with strong expression; repeat the maceration and straining again; mix the strained liquids and evaporate. If any salts are prescribed in connection with the elm, they should be dissolved separately and mixed with the mucilage, and the whole should be evaporated to a very thick consistence; to this paste, while still hot, the melted vehicle should be added, in small quantities at a time, with vigorous stirring. When it begins to thicken, fill the moulds, and when cold, with a spatula, scrape the surface quite level.

If the operations have been properly conducted, the suppositories will drop out upon inverting the mould.

From the foregoing remarks we extract the following three paragraphs as giving the essential requirements for the production of perfect suppositories:—

First. Have the moulds clean.

Second. Have them very cold when filled.

Third. Have the substance about the consistence of treacle when poured into the moulds.

Dispensing.—In dispensing suppositories care should be taken that they are placed in a box of the proper size, and are well packed to prevent their being broken while in the hands of the messenger. In very warm weather some pharmacists direct the messenger to carry the package by a loop in the string, which they form for that purpose in tying it up. This is to prevent their becoming soft, which might happen if put into the pocket or grasped with the hand; but this precaution is unnecessary in moist weather; indeed, it can scarcely be called a *precaution*, for, being carried in that manner it is apt to be exposed to the direct rays of the sun during transportation, which would be more apt to fuse them than the heat from the body.

It is customary to place cotton above and below the suppositories in dispensing, and for this purpose the common white cotton is frequently employed, but the bright pink, or jeweller's cotton, appears much better. It should be laid on the counter and pressed with the hand, and then cut of the proper size to fit the box, which should be of the following dimensions:—for one dozen vaginal, three and one-fourth inches long, two and one-fourth inches wide, one and three-fourth inches deep. For one dozen rectal, two inches long, one and a half inches wide, one and three-eighth inches deep.

The box should be constructed with regard to its use, and be made of some material that will not show the grease spots. A box covered with paper made in imitation of morocco, of a dark brown or black colour, is perhaps best adapted to this purpose, for it does not show the grease, and on this account would be preferred by all who wish the reputation of neat and tasty dispensers.—*The Chicago Pharmacist.*

THE PHARMACY BILL.

MEETING AT HULL.

At a Meeting of Chemists and Druggists, held on Tuesday evening at the Cross Keys Hotel, Market Place, Hull, which was well attended, Mr. Baynes in the chair, the following resolutions were unanimously adopted:—

"1st. That this Meeting having carefully considered the proposed Government amendments to the new Pharmacy Bill, acknowledges the desire of the Right Honourable W. E. Forster to meet the wishes of the trade, but is of opinion that the compulsory and penal clauses of the amended Bill are highly objectionable, and would fail to accomplish the objects sought, and strongly urges the withdrawal of the Bill, or reference to a select Committee, it being impossible to deal with the question of poisons during the present session of Parliament, and without full information on the subject."

"2nd. That in the interests of the public, and on principle, this meeting strongly objects to any compulsory regulations or penal restrictions, which do not apply to all dispensers of poisons alike, whether keeping open shops or not."

"3rd. That the best and most effective protection against accidental poisoning is the competency of the dispenser, and this being provided for by the Act of 1868, and registered chemists being already under stringent regulations in the sale of poisons and heavy responsibilities in the event of culpable negligence, and abundant evidence having been found during the recent agitation that great care is exercised by them in the dispensing and storing of poisons in the manner best adapted to their respective businesses, so as to ensure freedom from accidents, this meeting is of opinion no necessity exists, nor can any case be established for special legislation in the case of registered chemists."

"4th. That the preamble of the Pharmacy Act, 1868, declaring it is expedient for the safety of the public 'that chemists and druggists should possess a competent practical knowledge of their business,' will be best complied with and the object attained, by the Pharmaceutical Society devoting itself energetically to the advancement of pharmaceutical education, especially in the provinces, and that any action taken by the Society having reference to the internal management of pharmacies, should be in the form of suggestions or recommendations only, it being, in the opinion of this meeting, impossible to frame regulations which could safely or judiciously be made compulsory on all chemists throughout the kingdom."

"5th. That the Secretary be instructed to forward a copy of the foregoing resolutions to the Members of Parliament for the borough and East Riding, asking them still to oppose the Bill, and that they be forwarded to the Pharmaceutical Journal."

MEETING AT NEWCASTLE-UPON-TYNE.

A Meeting of the Pharmaceutical Chemists and Chemists and Druggists of Newcastle-upon-Tyne and Gateshead, was held in the College of Medicine, Newcastle, July 12, 1871, to consider the alterations proposed to be made in the "Pharmacy Act Amendment Bill;" J. W. Swan, Esq., in the chair.

The Bill as first printed, together with the proposed amendments having been read and considered, it was moved by Mr. Swan, seconded by Mr. Hunter, and resolved, "That this meeting sees in the new Pharmacy Bill an uncalled-for, premature and dangerous unsettling of the Act of 1868, under which poison regulations are now in force, and which duly provides for the enactment of additional regulations, presumably on the necessity for such arising; that in the opinion of this meeting the question of the enactment of additional compulsory regulations is one of so delicate and dangerous a nature that its settlement demands the utmost care and deliberation at the hands of those who are practically acquainted with the subject; and that whereas there is an entire absence of public urgency in the case, and even considerable risk of increased danger resulting from hasty and unpractical legislation, therefore it is desirable to allow the Act of 1868 to continue without the interference of any new legislation."

It was moved by Mr. Brockett, seconded by Mr. Owen, and resolved, "That inasmuch as the principal portion of the dispensing of medicines in Great Britain is performed by medical practitioners who will not be affected by the Bill even in its amended form, the proposed legislation would establish the striking anomaly, that poisons under the Act would or would not be subject to regulations according to the *place in which they were dispensed*, without any relation to their dangerous properties; this meeting, therefore, regards the measure as unwise, impolitic and unjust."

Moved by Mr. Coates, seconded by Mr. Hall, and resolved, "That this meeting is of opinion that the regulations for the storing of poisons, contained in the schedule of the amended Bill, are unsuited to the case, and unlikely to produce any good results; and further, that the schedule of poisons contained in the Act of 1868, intended to regulate the *sale* of poisons, is totally unfitted as a basis for regulations in respect to *storage* and *dispensing*."

Moved by Mr. Eno, seconded by Mr. Jobson, and resolved, "That in the opinion of this meeting, the only safeguard at present needed in addition to the regulations relating to the sale of poisons imposed by the Act of 1868, is improved education, and that is already provided for by the compulsory powers of the Pharmaceutical Society in respect to examinations."

It was announced by Mr. Owen that, in accordance with the resolution of a former meeting, upwards of £40 had been subscribed by chemists in Newcastle and some of the surrounding towns towards meeting past and prospective expenses in opposition to obnoxious legislation, and that after meeting expenses up to the present time, he had been enabled to invest in a building society the sum of £25, that the Secretary might feel that there was a little fund at his back whenever he might see necessary to take prompt measures for the protection of the trade.

MEETING AT MANCHESTER.

Copy of resolutions unanimously passed at a Meeting of Pharmaceutical Chemists and Chemists and Druggists, held at the Memorial Hall, Albert Square, Manchester, July 12th, 1871:—

Moved by Mr. Gill, seconded by Mr. Kerfoot, "That this meeting of the Pharmaceutical Chemists and Chemists and Druggists of Manchester and vicinity, is of opinion that the amendments to the Pharmacy Bill do not remove or mitigate the objections to the proposed legislation, and desires to express its determined and continued opposition to the Bill.

"1st. As it deprives the members of the Society of a constitutional right conferred by clause 1 of Pharmacy Act, 1868.

"2nd. It introduces into an Act of Parliament legislation for minute details of internal business arrangements, which would expose chemists to great inconvenience, from the large number of articles to which regulations would apply and the varying interpretation put on the requirement.

"3rd. That as the Act of 1868 makes full provision for sale of poisons, and prescribes educational qualifications for all dealers, the public is amply protected, and further legislation for storing is uncalled for and unnecessary, and would, indeed, be prejudicial as tending to weaken the sense of personal responsibility.

"4th. That the imposition of heavy penalties for undefined offences will be most unjust, vexatious to the trade and against public interest.

"5th. That the strong and almost unanimous expression of opinion from the trade is entitled to respect, and as the amendments proposed do not touch the objectionable principle of the Bill, as interfering unduly and unjustly with the freedom of an educated and responsible body of men, it is hoped that Members of Parliament will not relax their efforts to procure the withdrawal of the measure."

Moved by Mr. R. Hampson, seconded by Mr. W. Wilkinson, "That a copy of this resolution be forwarded to all Members of Parliament."

MEETING OF CHEMISTS AND DRUGGISTS AT LEEDS.

A Meeting of Registered Chemists was held on Wednesday, July 12th, at the Philosophical Hall, Leeds; Mr. W. Smeeton, President of the Leeds Chemists' Association, in the chair.

The following resolutions were carried unanimously:—

Moved by Mr. G. Ward, F.C.S., seconded by Mr. E. Yewdall, "That this meeting has carefully considered the amendments to the Pharmacy Bill offered by the Right Hon. W. E. Forster. It thankfully recognizes them as improvements, and their introduction as supplying an ample justification of past opposition to the Bill; viewing the amended Bill upon its merits, this meeting feels compelled to record its opinion, that by its partial application to dispensers of medicine, it would cause increased danger to the public, would be harsh and unjust towards those to whom it applies, and that its inconsistencies would bring into disrepute the principle of the systematic storing of drugs."

Moved by Mr. S. Taylor, seconded by Mr. J. Day, "That copies of the foregoing resolution be sent to the members for the borough and the division of the West Riding, and that they are requested to give Mr. Torrens the support of their votes in opposing the Bill, or at least promote its being referred to a Select Committee for further inquiry."

The thanks of the meeting were voted to the Chairman.

MEETING AT NOTTINGHAM.

At a large and important Meeting of the Chemists of Nottingham and district, held in the rooms of the Nottingham and Nottinghamshire Chemists' Association, the following resolutions were unanimously adopted:—

Moved by Mr. Waterall, seconded by Mr. Parker,—

"That the objections of this meeting to the Pharmacy Bill now before Parliament are,—

"1st. That the Act of 1868 did not pledge the Pharmaceutical Society to institute regulations of a compulsory character for the dispensing, keeping and selling of poisons.

"2nd. That such regulations are unnecessary, an unwarrantable interference with the freedom, and an insult to the intelligence of the chemists as a body.

"3rd. That regulations only applying to those keeping open shop, and not to all dispensers of medicine, are partial and unjust.

"This meeting, having discussed and considered the proposed amendments to the Pharmacy Bill introduced by the Right Hon. W. E. Forster, and, whilst acknowledging the concessions, regrets its inability to accept them, as removing the objections to the Bill."

Proposed by Mr. White, seconded by Mr. Jackson,—

"That the resolutions passed at this meeting be forwarded to the Members of Parliament for the town and county of Nottingham, with the earnest request that they will continue to support the prayer of the petition already presented to the House against the Bill."

The Pharmaceutical Journal.

SATURDAY, JULY 15, 1871.

Communications for this Journal, and books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

PHARMACY AND THERAPEUTICS.

THE proposal introduced by Professor PARKES, seconded by Professor CHRISTISON, and carried by a considerable majority of the Medical Council, to the effect that pharmacy should form an early subject of the student's curriculum, and that therapeutics should be taught as a separate branch at a later period, was justly described by Dr. ANDREW WOOD as one of the most important measures which that body had ever discussed and passed. In most schools, south of the Tweed particularly, the two subjects were taught together, and at a stage of the student's career when he could derive least profit from the study. In others, pharmacy was taught to the almost entire exclusion of therapeutics, or *vice versâ*, according to the taste or convenience of the lecturer. This unsatisfactory state of matters comes to an end as soon as the licensing and teaching bodies adopt (as they can hardly refuse to do) the proposal of their representatives in the Council.

Scarcely less important than this innovation on previous academic arrangements, was the suggestion also introduced by Dr. PARKES, that pharmacy should be taught in the tutorial or practical method, and not, as is so often done, from the professorial chair. This latter method was justly denounced by Sir DOMINIC CORRIGAN as preposterous,—the students acquiring painfully in the form of lectures what could far more conveniently be learned from a book, or, best of all, from tutorial instruction and demonstration in a well-appointed laboratory, or even shop. The time, indeed, is not far distant when the two subjects—pharmacy and therapeutics—will not only be taught separately in the medical student's course, but will finally be apportioned to distinct callings; the former to the duly qualified pharmaceutical chemist, the latter to the duly qualified medical practitioner. Division of labour is becoming more and more the rule in the professions,—in none more than in the healing art. The time allotted to the medical student for perfecting himself in the sciences preliminary to his purely professional studies is all too brief for the purpose; and his educators are more and more convinced that certain subjects should either be entirely dropped from his curriculum, or relegated to an inferior place in it. They are the less reluctant to advocate such a policy when they find that those subjects belong more properly to other callings, with whose members they may safely be left in trust. Such a subject is pharmacy. The public will have as much confidence in the medicines prepared by the duly qualified pharmaceutist as in the prescriptions enjoined by the duly qualified practitioner,—certainly more confidence in each exercising his proper functions apart than attempting to fulfil the functions of both. The guarantee that drugs are prepared *secundum artem* is as valid as the guarantee that they are prescribed *secundum artem*; and it seems useless to insist on medical students qualifying themselves for the former when they have but too little time to qualify themselves for the latter.

POISON REGULATIONS.

IT will have been evident to our readers that the amendments introduced into the Pharmacy Bill by Mr. FORSTER indicate on his part a much greater disposition to consider the objections raised to the Bill in its original form than was apparent when the deputation waited on him on the 24th ult. Without attempting to discuss the question whether the amendments sufficiently meet the objections that have been urged, we think it right to state that some opponents of the Bill are now disposed to take a more favourable view of it.

The action hitherto taken in reference to the Bill certainly indicated that it was opposed by a majority of members of the Society and of the trade, and the letters published this week will show that there is still a strong opposition to it. However, those who look with favour on the Bill are exerting themselves, and it is but just to them as well as to the opposing party, that we should make this known.

We have been requested by Mr. SANDFORD to publish a letter which he has addressed to the Local Secretaries of the Society, calling upon them and the members generally to exercise their independent judgment on the amended Bill, but urging various considerations which, in his opinion, should induce them to waive further opposition.

We have also been requested by the Secretaries of the two Chemists' Defence Associations to publish a circular which they have addressed to the trade, stating reasons for recommending uncompromising opposition to the amended Bill.

Both these documents appear to be of such importance as to claim a prominent place in the Journal, and therefore we print them together here in the order they reached us, and we commend them equally to the careful consideration of our readers.

"47, PICCADILLY, LONDON,
"*July* 10*th*, 1871.

"Sir,—My long and intimate association with the Pharmaceutical Society, my seven years' experience of the duties of the Presidency, and my personal connection with the Pharmacy Act of 1868, embolden me to believe that I shall, at least, be favoured with a fair hearing if I venture on the somewhat unusual course of addressing my fellow-members at this very important epoch in the existence of the Society. I think I am justified in calling the present conjuncture of affairs an epoch, because the Act of '68, which gave us great privileges, affixed as a condition thereto the performance of a certain duty, and this being the period when, by some means or other, regulations are to be commenced, I think it may fairly be called an epoch. This brings me to the question, all important at this moment, how shall those regulations be made? Do not imagine, if you please, that the notion of a duty undertaken is my own merely; all Members of Parliament with whom I have talked on the subject, whether they be favourable or adverse to the new Pharmacy Bill, agree in such an interpretation of the first section of the Act of '68.

"The facts of the case stand thus:—The Pharmaceutical Society declined at its last Annual Meeting to prescribe *regulations*, but set its seal of approval on certain methods of storing and dispensing poisons which had been most carefully set down by men knowing on the one hand the dangers, on the other the difficulties, in the way of dispensers. The Privy Council, who are in fact concerned in carrying out the Act of '68, said, naturally enough, you have not done your duty, and we must either urge you to do it, or do it ourselves independently of you. Hence the origin of the Pharmacy Bill which passed the House of Lords a few weeks ago, and is now in progress in the Commons. I would not have you under any misapprehension respecting the delay which has arisen. When the Bill came for second reading last Thursday, it was not postponed for any reason which concerns the Bill itself, as you may see by the discussion which has been published in the PHARMACEUTICAL JOURNAL, but merely because many members wished to protest against a growing infringement on the forms of the House, *i.e.*, reading Bills which are to be extensively altered, without giving the House a previous opportunity of seeing what those Amendments are.

"The Bill originally proposed is short and simple. It gives to the Council of our Society the power to submit regulations, from time to time, to the Privy Council for approval, and, if need be, to amend or revoke such regulations. It then states that if no regulations are in force, the Privy Council may call on us to frame some; and if we fail to do that and obtain the approval of the Privy Council thereto, that body may act without reference to us.

"When this Bill was first brought to our notice, the Council discussed its merits and demerits, resolved to watch its progress and endeavour to improve it.

"I was deputed, with the President, to see the officials of the Privy Council; and on doing so, we were met freely and fairly by concessions at once. First it was proposed to take away all initiative power from the Privy Council, by embodying *our own regulations* in a schedule to the Bill, and giving us authority to amend and revoke them from time to time, with approval of the Privy Council. Next it was agreed to add a clause which would compel *all* persons keeping open shop to observe the same regulations. Thus the two grievances were removed, and chemists would not be branded with what had been called the indignity of conforming to rules from which others were exempted. I thought we had thus succeeded admirably; but at a future meeting the Council, by a majority of *one*, decided still to oppose rather than amend, *although generally admitting that the objections to the Bill had been removed;* and you have had circulars, asking you, as plainly as possible, to confirm them in this opposition. It is at this conjuncture that I ask you to exercise your *free and independent* judgment in the matter,—not simply to continue your agitation if you disapprove, but if you approve, and think with me, that the Bill in its amended form (the Poison bottle, let me remind you, has been struck out of the dispensing clause) will be the best settlement we can hope to get of the question, and that an early settlement will be conducive to the good of our Society, to signify to those who represent you in Parliament that these fair Amendments being made, you no longer desire to obstruct its progress. In order that you may see exactly the scope of the Amendments, I enclose herewith a copy of the original Bill, side by side with a draft of that which will be submitted to the House on Monday next by Mr. Forster. We know the nature and extent of the regulations; we know that they are already adopted in very many establishments both in London and the country; that they are so elastic that almost any pet method of storing poisons which is not named in them would not be excluded by them; and further, that at a very full meeting of our Society a majority of nineteen only decided against making them at once compulsory. Beyond all this, we know that if, owing to the late period of the session, the Bill be shelved now, it will surely be reproduced at the very commencement of next session, when time will be in favour of the supporters rather than the opponents of the Bill, and perhaps 'Inspectors,' the necessity for whose appointment was so kindly suggested to Mr. Forster by the deputation a fortnight ago, may be provided for us.

"I could find many members of our Council—perhaps even a majority—to sign this letter with me, but as I am already a marked man for venturing to uphold what I believe to be the best interest both of the Society and the trade, in opposition to the last voting of my colleagues, I prefer standing alone in this communication, and I am sure you will believe me always

"Very faithfully yours,

"GEORGE W. SANDFORD."

Original Clause.	*Amended Clause.*
And the Council of the said Society may from time to time submit to the Privy Council regulations as to the keeping, dispensing and selling of poisons within the meaning of the principal Act, and as to revoking or amending any such regulations previously made, and the Privy Council may, if they think fit, by order approve of such regulations. If at any time it appear to the Privy Council that there are no regulations for the time being in force under the principal Act as to the keeping, dispensing and selling of poisons within the meaning of the principal Act, the Privy Council may serve a notice on the Council of the Pharmaceutical Society requiring them to frame and submit for the approval of the Privy Council regulations as to the matters aforesaid; and if the Council of the Pharmaceutical Society, within the time limited by such notice, not being less than two months from the date of the service of the notice, make default in framing such regulations, or obtaining the approval of the Privy Council thereto, the Privy Coun-	After the first day of October, 1871, the regulations as to the keeping, dispensing and selling of poisons within the meaning of the principal Act, which are set out in the schedule to this Act, shall be observed by all persons who keep open shop for the retailing, dispensing or compounding of poisons, and shall have the same effect as regulations prescribed in manner specified in the principal Act, and the provisions of the principal Act relating to such regulations shall be construed accordingly. Every person who keeps open shop for the retailing, dispensing or compounding of poisons, and fails to conform with any of the said regulations shall, notwithstanding anything contained in section sixteen of the principal Act, or in section one of the Pharmacy Act, 1869, be liable to a penalty not exceeding in the case of the first offence five pounds, and in the case of a second or any subsequent offence ten pounds, which penalties may be recovered on summary conviction as penalties under the principal Act may be recovered.

cil may themselves frame regulations as to the matters aforesaid.	The Council of the Pharmaceutical Society may from time to time, by resolution approved by the Privy Council, revoke, alter and add to the regulations contained in the schedule to this Act, or made in pursuance of this section, and make new regulations in their place; and such resolution so approved shall, on coming into operation, have effect as if it were contained in the schedule to this Act.
All regulations approved or framed by the Privy Council in pursuance of this section shall have the same effect as regulations prescribed in manner specified in the principal Act.	Every resolution so approved shall be published in such manner as the Privy Council may direct, and shall come into operation at the date of such publication, or such later date as may be specified in the resolution.

"Dear Sir,—The defeat of Mr. Forster's effort to read the Amended Pharmacy Act the second time last Thursday night, speaks volumes in favour of the action which has been taken in opposing this obnoxious Bill. It has been observed by one fully conversant with the general routine of business in the House of Commons, that to find so many independent members remain till so late an hour, except on special occasions, is a most uncommon occurrence, and powerfully evinces the interest taken in the present subject. The thanks of the whole trade are due to these gentlemen for thus practically demonstrating to their constituencies that the numerous expressions of dissent to the Bill which had been received were not disregarded, but that their interests were considered and watched by their representatives. Would that we could extend the compliment to all our representatives at Bloomsbury Square! We should not then find ourselves in the anomalous position of having to protect ourselves by combined action against those who ought to be our protectors.

"Having touched upon this subject, we cannot refrain from further expressing the feeling of regret which pervades the trade at seeing persons, whose election our two Associations supported, on the distinct avowal of sympathy with our views, now systematically voting in opposition to those opinions.

"In consequence of the alterations proposed by Mr. Forster, and confidentially communicated to the Pharmaceutical Council for consideration at the Meeting held Wednesday the 5th, a lengthy and earnest discussion took place, resulting in the adoption of the following resolution:—'That this Council has carefully considered the amendments to the Pharmacy Bill, introduced by the Right Hon. W. E. Forster, and regrets that it is unable to accept them as removing its strong objections to the Bill.' The members voting as a majority in favour of this resolution were,—Messrs. Atherton, of Nottingham; Bottle, of Dover; Frazer, of Glasgow; Reynolds, of Leeds; Sutton, of Norwich; Woolley, of Manchester; Betty and Greenish, of London,—showing most distinctly that—if these gentlemen reflect the opinions of their constituencies,—all the large towns and centres of population continue firm in their opposition to the Amended Bill.

"Let us now for a moment consider the position in which these amendments place us.

"In the first place, all open shops are now included. Does this satisfy us? Are we to be silenced by the fact that others will be drawn into the net in which we are threatened to be taken? Assuredly not! In all our personal interviews with members of Parliament we have been most careful, when exhibiting the anomaly of making laws applying to chemists, whilst others keeping open shops identical with our own were left unfettered, to assert our distinct objection to the principle of Government interference in such matters of practical detail, and also the absence of any desire on our part to inflict on others burdens and penalties to which we so strongly object for ourselves. If Mr. Forster's desire, however, is really the protection of the public, in order to be fully consistent therein he must of necessity include not only surgeons with open shops, but hospitals, dispensaries, infirmaries, wholesale dealers, oil and colourmen, drysalters, and every place where poisons are prepared, kept, or supplied in any way for public use, otherwise his Bill will be but partial in its operation, and unjust in its principle.

"A second alteration is, the removal of the power of initiating regulations from the hands of the Privy Council into the hands of the Pharmaceutical Council, the effect of which would be to deprive the Society, in its corporate capacity, of the power it now possesses of accepting or rejecting such additional regulations, and transferring the entire authority and power into the hands of the Pharmaceutical Council. To this we also distinctly object. Our voices have hitherto been raised against the assumption of that power by the Privy Council, on the ground that members of that body are of necessity ignorant of the essential practical details; we now, with equal distinctness, protest against the members of the Pharmaceutical Society being excluded from the power of expressing an opinion upon questions which vary so considerably in different localities, remembering that the representative character of that Council (as regards locality) may at any time, by circumstances over which we can have no control, be entirely destroyed, as illustrated only a few months since, when the seven members of Council elected by 'drawing of lots' were every one provincial men, leaving London entirely unrepresented.

"The third alteration is also one of great importance, appealing to every one of us in accents unmistakable, viz. the increase of penalty for omitting to carry out the prescribed regulations from five to ten pounds, for the second and subsequent offences against the law. Added to which, according to the 26th clause of the Act, 1868, the Privy Council may direct the name of any person convicted of any offence against this Act to be erased from the register.

"This we consider a most arbitrary exercise of power which in practice would be highly prejudicial to our interests, and add very materially and unnecessarily to our anxiety in conducting business.

"For the above reasons we feel satisfied you will feel it your duty to use every possible effort to prevent the passing of the Bill next Monday, the 17th inst.; to this end we would remind you that nothing carries more weight to the minds of your representatives in Parliament than communications from their own constituents. We would venture therefore to press very earnestly upon you to write, without a day's delay, to your members, showing them that the alterations, instead of removing objections, simply extend the ground of our disapproval, and urging upon them to give the Bill their unqualified opposition.

"We would further suggest that any surgeons keeping open shops in your neighbourhood should at once be made aware of the alterations in the Bill, by which they will be brought under the control of the Council of the Pharmaceutical Society.

"We are, Sir, your obedient servants,

"ROBT. HAMPSON, *Hon. Sec. to the*
"*Chemists' Defence Association, Manchester.*

"EDWIN B. VIZER, *Hon. Sec. to the*
"*Metropolitan Chemists' Defence Association.*"

THE REGISTER.

We have already had occasion to call attention to grave inaccuracies in the Register, and to defects in the provisions of the Pharmacy Act, 1868, for the keeping of a Register. These defects have lately been rendered apparent in sending out the circular of recommendations as to the keeping, dispensing and selling of poisons; for out of 12,894 persons whose names are on the Register, circulars could be sent to only 12,550, owing to defective addresses; and out of the circulars sent, 1065 were returned through the Dead Letter Office. According to this, there appear to be 1409 errors in the Register.

In order to remedy this state of things, advantage has been taken of the Pharmacy Act Amendment Bill now before Parliament, and, with the consent of Mr. Forster, a section has been introduced into it, amending the provisions of the Act of 1868.*

We call attention to this matter because it seems to be one of the points to be weighed in considering the Bill as now amended, and because it is of importance to the whole trade that a correct Register should be kept.

The Guernsey *Star* reports that a silver medal has been awarded to Mr. Adolphus Arnold, of Guernsey, for his "iodine and chemical products from sea-weed" and "sea-salt" exhibited in the Channel Islands Exhibition.

Transactions of the Pharmaceutical Society.

July 5, 1871.

MR. A. F. HASELDEN, F.L.S., PRESIDENT, IN THE CHAIR.
MR. EDWARDS, VICE-PRESIDENT.

Present—Messrs. Atherton, Betty, Bottle, Carr, Frazer, Greenish, Groves, Hills, Reynolds, Sandford, Savage, Shaw, Smith, Sutton, Williams, and Woolley.

The minutes of the previous meetings were read and confirmed.

Pharmacy Bill.

The President called the attention of the Council to the following letter, received from the Medical Officer of the Privy Council:—

"*Medical Department of the Privy Council*,
"*July 4th*, 1871.

"Sir,—I am directed by Mr. Forster to inform you that he has drafted certain clauses, which he is ready to propose as Amendments to the Pharmacy Bill now before Parliament, and which he hopes would remove the objections which your Society has expressed to the Bill in its present form.

"And I am to say that Mr. Forster has given instructions that a copy of his proposed amendments should be sent to you by the printer as early as can be to-morrow morning, with a view to your bringing them at once under the consideration of the Council of the Society.

"I am, Sir,
"Your obedient servant,
"(Signed) John Simon.

"*The Secretary to the*
"*Pharmaceutical Society.*"

The Secretary then read the proposed amendments, and laid copies on the table.

* See p. 35.

The President observed that as the subject now before the Council was important, and demanded immediate consideration, he would at once submit a motion thereon.

It was accordingly moved by the President, seconded by the Vice-President,—

That this Council considers the amendments which the Right. Hon. W. E. Forster proposes to make in the Pharmacy Bill satisfactory, and hereby withdraws its opposition to that Bill.

Amendment—

Moved by Mr. Betty, seconded by Mr. Woolley,—

That this Council has carefully considered the amendments to the Pharmacy Bill introduced by the Right Hon. W. E. Forster, and regrets that it is unable to accept them as removing its strong objections to the Bill.

For the Amendment (9)—

Messrs. Atherton, Betty, Bottle, Frazer, Greenish, Reynolds, Shaw, Sutton and Woolley.

Against (8)—

Messrs. Carr, Edwards, Groves, Haselden, Hills, Sandford, Smith and Williams.

Mr. Savage was present at the division, but did not vote.

The amendment was then put as a substantive motion and carried.

Moved by Mr. Betty, seconded by Mr. Woolley—

That the Report of the Council's vote on the Pharmacy Bill be furnished to Mr. M'Cullagh Torrens.

Moved by Mr. Edwards, seconded by Mr. Williams—

That the *number* and *names* of those who voted be added to the Report sent to Mr. Torrens.

For (9)—

Messrs. Carr, Edwards, Frazer, Groves, Haselden, Hills, Sandford, Smith and Williams.

Against (7)—

Messrs. Atherton, Betty, Bottle, Greenish, Reynolds, Shaw and Woolley.

The Amendment being carried, the motion was passed with the additional words.

Moved by Mr. Hills, seconded by Mr. Frazer, and

Resolved—That the Right Hon. W. E. Forster be applied to for permission to publish the draft Amendments, which have been submitted to this Council this morning, in the next issue of the Journal.

Moved by Mr. Bottle, seconded by Mr. Reynolds, and

Resolved—That the Secretary do report to the Right Hon. W. E. Forster the decision of this Council in reference to his proposed Amendments to the Pharmacy Bill.

Admission of Reporters.

Mr. Betty, who had given notice of a motion on this subject, withdrew it in favour of Mr. Reynolds.

Moved by Mr. Reynolds, seconded by Mr. Betty—

That this Council is willing that reporters for the press should attend its sittings, a separate application being made on behalf of each Journal desirous of such attendance, and the permission that may be granted being subject to the continued willingness of the Council.

Amendment, moved by Mr. Carr, seconded by Mr. Sandford—

That the Society's own reporter be engaged to attend the monthly and special meetings of the Council, for the purpose of taking a full report of the proceedings, that the Publication Committee be authorized to publish in the Journal and Transactions of the Society the whole, or such portion of the Report as they may deem necessary.

For the Amendment (10)—
Messrs. Bottle, Carr, Edwards, Frazer, Groves, Haselden, Hills, Sandford, Sutton and Williams.

Against (8)—
Messrs. Atherton, Betty, Greenish, Reynolds, Savage, Shaw, Smith and Woolley.

The Amendment was then put as a substantive motion, and carried.

The Report of the Finance Committee was presented, showing on the General Fund account a balance in the Treasurer's hands of £2509. 18*s.* 0*d.*, and submitting for payment accounts, salaries, etc., amounting to £1470. 9*s.* 9*d.*; and showing on the Benevolent Fund account a balance of £578. 14*s.* 7*d.*

Resolved—That the Report be received and adopted, and payments made.

Resolved—That the Treasurer be requested to pay the several annuitants their quarter's annuities in advance to Michaelmas next.

Resolved—That the Report of the Library, Museum and Laboratory Committee be received and adopted.

The Committee having recommended that certain gentlemen should be deputed to make arrangements for the Evening Meetings of the Pharmaceutical Society, it was

Resolved—That the following be requested to undertake that duty:—The President, Vice-President, Mr. Daniel Hanbury, F.R.S., Professors Redwood, Bentley and Attfield, and Dr. Paul.

Resolved—That the Reports and Recommendations of the Parliamentary Committees of the 14th, 19th and 24th June, and 4th July be received and adopted.

Resolved—That the Report of the Provincial Education Committee be received and adopted, and that the Treasurer be requested to pay the following sums recommended by the Committee:—

Ten pounds to the Society of Chemists and Druggists of Aberdeen.

Ten pounds to the Nottingham and Notts Chemists' Association.

Ten pounds to the Midland Chemists' Institute.

Moved by Mr. Carr, seconded by Mr. Groves,

Resolved—That the Report of the Special Committee "to direct the operations of the Society in communicating with the local secretaries and members upon the subject of opposing the Bill" be received and adopted.

Professor Redwood was reappointed Professor of Chemistry and Pharmacy for the ensuing year.

Professor Bentley was reappointed Professor of Botany and Materia Medica for the ensuing year.

Professor Attfield was reappointed Professor of Practical Chemistry and Director of the Laboratory for the ensuing year.

William Augustus Tilden, D.Sc., was reappointed Demonstrator for the ensuing year.

Mr. John Moss was reappointed Assistant Demonstrator for the ensuing year.

Dr. Paul was reappointed Editor of the Society's Journal for the ensuing year.

Mr. Francis Passmore was reappointed Sub-Editor of the Society's Journal for the ensuing year.

A letter from the Medical Department of the Privy Council office was read, approving the appointment of Examiners for England and Wales and Scotland.

Mr. Alexander Noble was appointed an Examiner in Scotland, subject to the approval of the Privy Council.

REPORT OF THE BOARD OF EXAMINERS.

England and Wales.

June, 1871.

Examination.	Candidates examined.	Candidates passed.	Candidates failed.
Major	10	8	2
Minor	28	20	8
	38	28	10

Preliminary. One Certificate was received in lieu of this Examination.

Resolved—That the following, being duly registered as Pharmaceutical Chemists, be respectively granted a diploma stamped with the seal of the Society:—

Byles, James Henry..........London.
Churchill, Henry............Reading.
Lake, Richard..............Colchester.
Overton, Charles Arthur......Horncastle.
Pretty, Charles..............Birmingham.
Savory, Harry Banting......Painswick.
Walker, John Sydenham......Manchester.
Wing, Lewis................Torquay.

Resolved—That the following, being duly registered as Pharmaceutical Chemists, be elected Members:—

Savory, Harry Banting......Painswick.
Walker, John Sydenham......Beverley.

Resolved—That the following registered Chemists and Druggists be elected Members of the Society:—

Bagshaw, William..........Oldham.
Bass, James Thomas........Hemel Hempstead.
Campion, Robert............Harlow.
Coates, George Henry........Barlow.
De Witte, Henry Huskisson..Liverpool.
Gabriel, John Wild..........London.
Maunder, William..........Teignmouth.
Newbigin, James Leslie......Alnwick.
Rogers, Robert..............Plymouth.
Troke, Charles..............Stamford Hill.

Resolved—That the following, having passed their respective examinations, be elected Associates in business:—

MINOR.

Awbery, Albert Richard......Henley-on-Thames.
Sowray, Joseph............York.
Tomlin, Albert Roberts......Barnsley.

MODIFIED.

Barnett, Thomas James......Castle Hedingham.
Finch, Albert Henry........Swansea.

Resolved—That the following, having passed their respective examinations, be elected Associates of the Society:—

MINOR.

Baldock, James Thomas......Rochester.
Beach, Tom Clarke..........Great Malvern.
Bradley, William............Dudley.
Butcher, Henry............Sheffield.
Fegan, John................Exeter.
Fingland, William, jun.......Thornhill.
Goulden, Herbert............London.
Holme, William James......Bacup.
Hughes, James..............Swansea.
Jones, William Ellis........Barmouth.
Mills, Robert................London.
Rammell, Edward..........Crediton.
Rogers, John Maulden......Newport Pagnell.
Watmore, James............Wokingham.

Williams, Jabez Vivian ......Ramsgate.
Wood, Alexander............New Brentford.

MODIFIED.

Finch, Thomas..............Edinburgh.
Herbert, William............Southwark.
Johnson, Arthur ....Rotherham.
Mason, John.................Hastings.
Midgley, Charles............Bradford.
Spyer, Newton..............Watlington.
Turpin, Alfred Barritt ......Oxford.

SUPPLEMENT TO THE REPORT OF THE SPECIAL COMMITTEE.

(*See page* 33.)

Name of Town.	No. of Chemists and Druggists in Town.	No. of Signatures.
Leeds	102	100
Stroud	12	12
Shrewsbury	18	18
Ramsgate	11	10
Huddersfield	..	12
Whittlesea	..	26
Dudley	..	18
Harwich	3	3
Warrington	10	10

Provincial Transactions.

MIDLAND COUNTIES CHEMISTS' ASSOCIATION.

At a Council Meeting held in the library of the above Association on Friday, July 7, the following circular was ordered to be printed and circulated amongst the chemists of the Midland Counties:—

"Dear Sir,—At the last meeting of the Council of this Association it was resolved to endeavour to extend its operations and the sphere of its usefulness by taking more active cognizance of the various questions relating to trade and education which have especially arisen out of the Pharmacy Act of 1868, and by providing rooms in Birmingham for the transaction of the business of the Association, for the general purposes of a trade office, reading and club rooms, and for any other objects connected with the interests of chemists and druggists.

"The Midland Counties Chemists' Association is not without its records of useful services. Amongst these may be mentioned the successful influence (as the Council believe) which it has brought to bear upon the Government in the framing of the Petroleum Act, in a form which it is expected will be acceptable to chemists;—in the providing of excellent courses of lectures for students in chemistry and pharmacy, in the winter of 1869–70, and in the compilation of the Midland Counties Chemists' Price Book, which has had so much demand that a second edition is already issued. And yet, having regard to the important interests of the great midland district, the Council are conscious that the Association has not yet risen to the full position which it ought to occupy. Twenty years ago the 'Birmingham Pharmaceutical Institution' was second to none in the provinces, but since its decadence, associations of chemists in other great centres, such as Liverpool, Manchester, Leeds, Nottingham, Bristol, have conspicuously come to the front, and now maintain, with unabated ardour, their vigilant supervision of whatever relates to the interests and welfare of pharmacy. They have each their representatives in the Council of the Pharmaceutical Society in London, whilst the chemists of the Midland Counties of England and Wales, covering an area of more than 100 miles from east to west, or from north to south, with Birmingham for their commercial centre, do not possess a powerful organization, and do not now possess one representative at the London Board.

"It is with the intention of remedying this state of things that the Council of the Midland Counties Chemists' Association now makes an appeal to all chemists residing within the vast district of which Birmingham is the centre, to unite together in the formation of a vigorous Association. The passing of the Pharmacy Act of 1868 has imposed upon chemists the necessity of a higher education, which will in due course of time elevate the general character of the trade, and invest it with greater responsibilities. The provision of facilities for the education of young men in pharmacy, chemistry, etc. etc., is rendered easy in Birmingham, where appliances for this purpose exist in abundance. The Council of the Association invite young men, desirous of availing themselves of courses of lectures in aid of their studies, to communicate early with the honorary secretaries, who will give them information of the terms on which classes in connection with the Queen's College may be formed.

"Besides these just claims upon the services of such an Association as this, there are others affecting the privileges of chemists and druggists under the Pharmacy Act of which the Association will take cognizance. It is well known that there are persons who continue with impunity to sell poisons who are not registered under the Act, and who thus render themselves obnoxious to the law, but who, in the absence of any prosecutor, escape its penalties. All members of the Association are invited to report to the Council any cases of the evasion of the Pharmacy Act which they are able to substantiate, and measures will thereupon be taken to protect the privileges of its members in this respect.

"The Council will also make it their business to watch the various questions on which (like the present 'Amended Pharmacy Act,' now before the House of Commons) the expression of opinion throughout the country is so important. It may be here mentioned that the Council have sent one petition to Parliament on this question, and have set on foot another to be signed by individual chemists, praying Parliament to suspend the present Act until the recent 'recommendations' of the Pharmaceutical Council have been tried, or until all other dispensers of medicine in Great Britain are included in one measure of regulation.

"It will also be the duty of the Council of the Association at the next election of the Council of the Pharmaceutical Society, to insist upon the claims of Birmingham and the Midland Counties to one seat (at least) on the Board in London, of which this district has been deprived by the action of other Associations.

"The offices of the Association, which are now open at the Quadrant Chambers, Birmingham, are furnished with the nucleus of what it is hoped will become a useful library of reference and research for chemists in all questions affecting their trade occupation, and for assistants desirous of qualifying themselves for the examinations. Periodicals are laid upon the table, and there is accommodation in the rooms for the reception and display of any trade novelties which manufacturers or firms in business may desire to bring under the notice of druggists; the only condition required in sending such articles being that they shall become the property of the Association, and be sent carriage paid.

"Meetings of the Association will be held in these rooms on the first Friday in each month, at three o'clock P.M., for the transaction of business. All members throughout the Midland Counties are earnestly invited to attend these meetings, and to support them by their influence. The rooms will be freely at the service of all assistants and apprentices (members of the Association), where they may hold meetings, read original papers, and use them for the purposes of a club. The rooms will be open from 10 A.M. to 10 P.M. All chemists (members of the Association) and their friends are invited freely to make use of the accommodation they afford by making it a general rendezvous, chemists' exchange, club room, reading room, writing room, house of call, etc. etc., and a place of neutral ground for meeting trade travellers, for whose samples, if desired, one of the rooms may be occasionally engaged.

"It remains only to add, that to promote these varied objects, an increase of the income of the Association is necessary. At present 102 gentlemen are members of it. It will need an increased number of members and of subscriptions to maintain the objects in view efficiently. The *minimum* subscription is 5*s*. per annum for principals and 2*s*. 6*d*. per annum for assistants and apprentices of chemists. Many voluntary subscriptions, however, on a more liberal scale, are already offered and made, as well as liberal donations towards the preliminary expenses of the offices."

A vote of thanks was passed to the Council of the Pharmaceutical Society for a grant of £10 in aid of the library fund.

Proceedings of Scientific Societies.

THE GENERAL MEDICAL COUNCIL ON PHARMACY AND THERAPEUTICS.

On Thursday, the 6th inst., this body met under the presidency of Dr. PAGET. The subject before it was the recommendations of the Committee on Education. Dr. PARKES, in bringing these forward, proposed, first: "That it is desirable that instruction in pharmacy should be separated from that in therapeutics, and that the former should be attended at an early, and the latter at a later, period of the medical curriculum." The Council, he remarked, had much reason to be satisfied with the influence produced by the reports of the visitors of examinations and the report of the Committee on Professional Education in 1869. The licensing bodies had adopted all the more important of the suggestions made to them. This was but natural, as the suggestions had been well conceived, and had been met by the licensing bodies in a proper spirit. As to the proposal now before the Council, he said that it was obvious that instruction as to the drugs used in medicine, and the means of compounding them, should be separated from instruction as to their use, which could be adequately understood only when the student had attended courses on physiology, medicine and surgery. The majority of the more experienced teachers of these subjects had, in the Committee's Report of 1869, strongly recommended the teaching of pharmacy at a different stage of the medical curriculum from the teaching of therapeutics. Dr. Christison, whom the Council should respect as much as any English or European authority, had expressed himself strongly in favour of the proposed separation. Dr. Aquilla Smith had given the same opinion. The educational report had recommended that the teaching of pharmacy should be made more practical and tutorial than hitherto; but this was a point for the licensing bodies to deal with. That such a plan, however, was desirable was proved by the manner in which the course was carried on in the University of Aberdeen. Dr. Harvey, the professor there, might publish his account of the course with advantage; while Dr. Macrobin, the member of Council for that University, would corroborate his opinion as to the satisfactory working of the plan.

Dr. CHRISTISON seconded the motion. The defects of the present system he had been the first to see, and the first to suggest its improvement. Materia medica had formerly a very comprehensive signification, including the natural history and character of medicines, and the mode of preparing them for use; their action, so far as it was known, and the diseases to which they were applied, to which was afterwards added the subject of dietetics as a remedy. For a long time materia medica continued to be so understood in Scotland, whose seats of learning borrowed the system very largely from the Dutch school. Materia medica, however, was not now regarded in the same way; and he was much surprised, on engaging in his present professorship, to find that the London Apothecaries' Society gave it a totally different meaning. The students were required to attend a course on this subject the first year. Now, materia medica, properly understood, could not possibly be studied in the first year. The more important parts of it could be taken up only at an advanced period. On making inquiry he found, what the shortness of the London course had led him to suspect, that it was almost always only a course of pharmacy. It was sometimes argued that the branch of pharmacy having attained such perfection in the hands of pharmaceutical chemists, practitioners might leave the subject unstudied. It appeared to be forgotten, that in many parts of the country, medicines were not to be obtained from a chemist but only from the practitioner, who ought, therefore, to know their distinctive characteristics. The subject should be studied practically as well as by lectures. This, however, was not always possible. Edinburgh University lacked (in the mean time, at least) the requisite accommodation. In a good practical dispensary the students could be well taught in a body, if there was adequate accommodation. It was not necessary that the patients should swallow all the prescriptions made up by the students. The subject might be taught in a short time, so as to obviate the necessity of the student obtaining instruction at a chemist and druggist's, which was now generally required when an apprenticeship had not been served. Thus the student's work would be really lessened. Of course the period of study should be early,—after chemistry and botany. With regard to therapeutics, some persons thought it beneath consideration. This was partly due to the way in which it had been taught. He declined to say anything specific on that subject; but he knew that in many schools therapeutics had been greatly neglected. The subject might be made highly attractive; and it included many points beyond the sphere of the lecturer on the practice of medicine, unless he went far out of his way. Therapeutics, as a course, should come near the end. It was most important in giving effect to the other branches. Without it the most accurate diagnosis would be incomplete.

Dr. MACROBIN supported the motion.

Dr. HUMPHRY moved, and Dr. APJOHN seconded, as an amendment, "That practical instruction in pharmacy may, with advantage, be substituted for formal lectures on the subject, and should be attended at an early period of the professional curriculum; and that instruction in therapeutics should be conducted at a later period of the professional curriculum, either by a special course of lectures, or as an essential part of the course of lectures on medicine and surgery."

Dr. ANDREW WOOD and Dr. AQUILLA SMITH supported the original proposal and criticized the amendment. Ultimately, after a desultory and slightly acrimonious discussion, Drs. Parkes and Christison carried their point by a decisive majority.

Parliamentary and Law Proceedings.

HOUSE OF LORDS.

PETROLEUM BILL.—*July* 7.—The report of amendments in the Petroleum Bill was brought up and agreed to.

NITRO-GLYCERINE ACT (1869).—*July* 10.—The Earl of Shaftesbury presented a petition from proprietors, managers, miners and others interested and employed in ironstone mines at Whitehaven, praying that so much of the Nitro-Glycerine Act of 1869 as extends its provisions to dynamite may be repealed, or that an Act may be passed declaring that dynamite shall be excluded from the operation of the said Act, and that dynamite and all other explosives used in mines and quarries may be placed on the same footing and subject to the same restrictions as gunpowder is now by law subject to.

HOUSE OF COMMONS.

Pharmacy Act (1868) Amendment Bill.—*July* 10.—Petitions against this Bill were presented from—

Chichester, by Lord H. Lennox.
Congleton, by Mr. W. Egerton.
Harwich, by Colonel Jervis.
Launceston, by Mr. Lopes.
Lewes, by Lord Pelham.

July 11.—Petitions against the Bill were presented from—

Biggleswade, by Mr. A. Russell.
Caistor, by Mr. R. Winn.
Gloucester, by Mr. Price.
Great Yarmouth, by Sir E. Lacon.

July 12.—A petition against the Bill was presented from Peterborough, by Mr. Whalley.

Nitro-Glycerine Act (1869).—*July* 7.—A petition from Whitehaven was presented by Mr. C. Bentinck to the same effect as that mentioned above (House of Lords).

Poisoning of Seventeen Children by Calabar Beans.

An incident is reported from Liverpool, which, apart from the large number of children injured, is remarkably similar to one that occurred in the same town seven years since, and reported in this Journal.*

On Monday last seventeen children, who with others had been playing on some waste ground in Boundary Street, where a quantity of rubbish—probably the sweepings of a ship or warehouse—had been deposited, were found to be suffering from the effects of poison. Amongst the rubbish the children had found a quantity of Calabar beans, some of which they had eaten. Eleven of the children were taken to the shop of Mr. Smith, druggist, in Athol Street, who immediately administered emetics and rubbed their chests with spirits of turpentine. Medical assistance was obtained, and these and the other children were pronounced to be out of danger the same evening.

The police have not yet discovered whence the rubbish came, or who were the persons culpable in depositing it in a public place. Three loads of the rubbish were at once removed, and buried in a pit covered with clay.

Poisoning by Prussic Acid.

An inquest has been held in Liverpool on the body of Samuel Hudson, aged 40. It appeared from the evidence that the deceased was eccentric, nervous and irritable in manner, and in the habit of drinking. Latterly he seems to have been in money difficulties and depressed in his mind. On Saturday morning he went to Messrs. J. H. and S. Johnson's, druggists, Church Street, and asked for an ounce bottle of prussic acid. He said that he wanted it for photographic purposes, and requested that it might be put into a peculiar-shaped bottle. Being a customer to the firm, and not appearing otherwise than usual, he was served with the prussic acid. The same afternoon a workman employed by him found him lying dead in his workshop.

Dr. W. J. Morris, from the Southern Dispensary, made a *post-mortem* examination of the body, and found that death had resulted from prussic acid, there having been more taken than would be certain to destroy life.

Verdict—"Died from swallowing prussic acid, but how administered there was not sufficient evidence to show."

* 2nd Ser., Vol. VI., p. 134.

Alleged Poisoning by Arsenic.

Much excitement prevailed at Cambridge on Monday last, owing to the exhumation of a man named Day, and the further examination of the widow of the deceased, who was reapprehended on Saturday in consequence of the detection of poison in a pudding on a second analysis made by Professor Liveing. The body was exhumed early in the morning, and the portions of it required by Dr. Letheby were sent to London in charge of an officer. At the police-court the town-clerk stated that since the last occasion of the woman appearing in court, Professor Humphry, Dr. Pagett and Professor Liveing had been consulted, and they were now awaiting the report of Dr. Letheby, but sufficient additional evidence would be given for a remand.

Professor Liveing, Professor of Chemistry in the University of Cambridge, said that he made an analysis of the pudding before the day of the adjourned inquest, but detected no poison. On Saturday last he made a further analysis of another part, and found some arsenic.

The prisoner, who said that she was innocent and did not put anything into the pudding, was remanded.

Obituary.

THOMAS HAWKES TANNER, M.D.

Medicine has lost an able and zealous practitioner in Dr. T. H. Tanner, who died at Brighton on the 7th inst., at the early age of forty-six. Dr. Tanner was educated, we believe, at the Charterhouse and King's College, London; becoming a member of the Royal College of Surgeons of England in 1847, and graduating as Doctor of Medicine at St. Andrew's in the same year. His career will hereafter be cited as one of the first in which success was attained not by reputation won at hospitals or societies so much as in the pages of medical journals and of publications addressed to the student and the general practitioner. His works, most of which were enlarged from their original tiny dimensions to stout octavos, enjoyed immense popularity with the candidate for examination and the "run-and-read" physician. They were remarkable for the skill with which their author worked down the latest results of science to undergraduate apprehension or to general practice, and were the means of winning him a professional name, which he was rapidly raising in the esteem of his brethren when death removed him from his wide circle of patients and friends.

DR. A. KEITH JOHNSTON.

The author of the 'National Atlas,' and still more of the 'Physical Atlas,' deserves a passing notice at our hands. Dr. A. Keith Johnston died on Sunday at Ben-Rhydding, in his sixty-seventh year. He was trained for the medical calling in Edinburgh, the city of his birth. Wisely, however, he devoted himself to the science of geography, in its largest sense; and in 1843 gained the applause of the learned at home and abroad by his 'National Atlas,' a work which cost him fifteen years' research in the geographical literature of nearly every European tongue. This was succeeded by his 'Physical Atlas,' which, suggested by Berghaus, superseded that geographer's work by its fulness and accuracy of information on the geology, meteorology, climatology, hydrography, magnetism, etc., of the globe, with the vegetable and animal kingdoms which inhabit it. A member of every geographical society of note throughout the world, he took an active interest in the meteorological and epidemiological societies. He did much for medical geography; and only a few weeks before his death he received the Royal Geographical Society's medal in token of that body's appreciation of his services. Greatly esteemed in private and public, he goes down to the grave with the honour of having done more for geography, from its humblest educational up to its highest scientific aspects, than any man of his time.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

The Amended Pharmacy Bill.

Sir,—Mr. Forster will ask the House of Commons on Monday next to vote the principle of the Bill for the amendment of the Pharmacy Act. There is time to say a word on this principle and the form of procedure adopted by the Government on this occasion.

The intention of the Pharmacy Act, 1868, we may all agree at the outset, was to ensure the public safety. On its spirit, or mode of fulfilling that intention, the Privy Council and our body are of opposite opinions; the former stating that it should be carried out by mechanical arrangements, whilst we insist that the spirit of the Act is educational, and attains its result by educating chemists for their business. On this point Mr. Forster agrees with us; having stated to the first and second deputations of the Council that if all chemists possessed the same educational qualifications as the gentlemen present, no regulations would be necessary. He also stated at the last interview that he had answered a letter received from Mr. Schacht to the same effect.

On these repeated assertions we found the justice of our claim for non-intervention. It is a narrow issue, and we raise it on the question. We are daily adding to our ranks those only who give proof to our examiners and to the Government assessor of their fitness for their calling, and will not this legislation permanently affect them? The Bill, as first drawn by the Privy Council, was pressed forward in the House of Lords with all the momentum of a Government measure. The first intimation the Council received of such a Bill existing was a summons to attend a special meeting for the purpose of considering a Bill which had been read a second time in the House of Lords the previous evening.

This was an act of injustice to the Pharmaceutical Council, and one of discourtesy to the Peers, inasmuch as discussion on the second reading was balked. *Inter alia,* the Lords were not permitted to be informed of the attempted design by the Privy Council to impose upon the trade, by a side-wind, that peculiar bottle which in 1868 they had formally condemned, and which Lord Salisbury had freely attacked as involving a principle of legislation alien to the spirit of laws which should prevail in this country.

A Bill started so unfairly could not escape rude checks in its course. It was found to be merely a Bill of pains and penalties, so unable to endure the touch of criticism, that when brought face to face with public opinion the Privy Council was fain so far to alter its provisions as to virtually constitute it a new Bill. Thus the House of Commons judged when it met the motion for the second reading by cries of "withdraw" too general to be disobeyed by the Minister.

The House of Lords had thus, by listening to the representations of Government, sanctioned by their vote a Bill which its authors were compelled within a month materially to change. Not a considerate or respectful manner of treating that assembly! Mr. Forster says such a course is not unusual; and we say perhaps the great suspicion and the hostile votes that assembly has so repeatedly of late bestowed on Government measures may be read by the light of this transaction.

The Government having thus, in the face of Mr. Forster's expressed opinion, disregarded the spirit of the Act, 1868, viz. that the calling of a chemist and druggist is a responsible one, and those following it should be educated to fulfil its duties, has floundered in a sea of difficulties. In attempting to remove anomalies which were inherent to their Bill, their amendments, or, more properly, their new Bill, violates the spirit of the Act which they allege it supplements. Of what offence has the medical profession been guilty that both the Act of 1868 and Dr. Brewer's Amended Act should be violated? In these Acts clauses specially exempt medical men from interference; the present Bill seeks to impose upon them the present and all future regulations which the Pharmaceutical Council and the Privy Council may deem proper to impose; and, although the present Bill restricts its operation to those keeping open shops, it may, if allowed to go into committee, come out in a form scarcely recognizable to any of us. Perhaps some logical mind in committee will urge that a medical man is the best judge how he shall conduct his business, another that if any are to be under this Act, why not all,—hospitals, dispensaries, private surgeries?

We as a body declare that regulations which we objected to for ourselves are not more acceptable because imposed upon others. We have not yielded to the tempter, who says in effect, You think my proposals evil, but now you can more gracefully yield to my solicitations, for I have the same intentions towards your sister. We reply, that acquiescence in such a proposal, and for such a reason, would only add to the family disgrace.

The Government, catering for support to its Bill, has sought by such a proposition to disarm the opposition of chemists; and a letter recently sent to members of the trade shows that these means have not proved wholly unsuccessful.

The poison bottle is cast overboard,—what policy can guide the Privy Council? A short time since it was insisting that the public safety demanded the adoption of such a bottle; now it leaves the public safety to shift for itself without it. Did it find that, like its proposal to regulate the dispensing of poisons in single doses, it would not quite do? or is it that, failing to secure that amount of support it calculated upon in the House of Commons, it now comes forward, having re-adjusted its Bill, dropping the bottle on one side and picking up the surgeons on the other? We are told these concessions are proposed by the Government as a compromise to answer our objections to some details of the Bill. The time for compromise would have been more gracefully chosen before the threatened defeat of the whole measure; and if compromise be the right principle upon which to act, until how recently has the Privy Council been wanting in it?

The fact is, our great strength in this conflict has been the disapprobation of such attempted over-legislation by a Government department entertained generally by the members of the House of Commons. We watch very jealously in this country any attempt at bureaucratic government. The powers of the Privy Council are great, and for that reason are the more jealously watched; otherwise, following the natural tendencies of unelected bodies, its irresponsibility would lead it into abuses not inconsistent with its name, which would cause it to become in time the Star Chamber of the nineteenth century.

It is only an inexpressible awe for any communication from the Privy Council that can explain the attitude taken by preceding Councils. They have proved to be made of very squeezable materials—swayed now by those letters from the Privy Council Office, now by the opposition of their constituents, now proposing to the Privy Council regulations for storing poisons, now at the bidding of that body adding the poison bottle; then proposing these regulations to the trade, then voting them as recommendations; and, lastly, at the annual meeting not concealing their desire, if they did not vote, for giving these regulations the force of law. They have been actuated by the policy of making things pleasant all round; but, like the old man and his ass, they have "tried to please everybody and pleased nobody."

Strengthened by the confidence and support of the great body of our trade, the present Council has dropped this india-rubber policy. The only pressure they should answer to is that of public opinion; and so long as that speaks in favour of an opposition to the principle of this Bill, so long ought they to endeavour to destroy it, by every means their office affords.

S. C. Betty.

The Report of the Special Committee.

Sir,—In the Journal of July 8th you publish the returns forwarded by local secretaries as to petitions against the Pharmacy Bill. Under Brighton I find it stated, number of chemists and druggists in town 52, and number of signatures obtained 52.

If this is intended to convey the impression that all the Brighton chemists signed this petition it is, as far as I am concerned, incorrect. I am a Brighton chemist, and neither have I, nor do I intend, to append my signature to such a document.

In inserting these lines in your next number, you will greatly oblige

J. Schweitzer.

[*** These returns were furnished by the Committee.—Ed. Pharm. Journ.]

Sir,—In the recent returns requiring the numbers of those who signed against Mr. Forster's Bill, and also the number of chemists in the respective towns, opposite Brighton was 52, in each case. This has led to an erroneous conclusion, which I am desirous of rectifying. All that I saw readily signed the petition, but as some were out their names did not appear. Others, however, on the register, but not in business on their own account, signed, which seemed to me in number equal to those that were out. Subsequently, on going more carefully through the names, I find 56 chemists in Brighton in business. I have heard that one of the absent ones was opposed to the petition, and therefore, in justice to him and the other three whom I did not see, this explanation is due.

July 11*th*, 1871. W. D. SAVAGE.

Sir,—The tabulated return of chemists and druggists is very much calculated to mislead, so far as Kingston-upon-Hull is concerned, and therefore I must ask you to permit me to explain to those it may interest that while the number of persons on the register is 124, the actual number of chemists in business, as nearly as I can ascertain, is 90, all of whom have signed the petition against the new Pharmacy Bill, with one exception.

Please insert this in next issue of PHARMACEUTICAL JOURNAL.

Hull, July 11*th*, 1871. FRANCIS EARLE.

Sir,—In the list of petitions in your last number I notice an error regarding the Newcastle petition. I stated that there were about 70 chemists in Newcastle, and that the petition was signed by the chairman and secretary of the meeting, according to its unanimous vote.

BARNARD S. PROCTOR.

Newcastle-on-Tyne, June 11*th*, 1871.

A CONFERENCE QUESTION.

Sir,—In Saturday's Journal there is a letter, of which you take notice, from "A Conference Man," regarding certain arrangements in connection with the annual meeting of the Conference shortly to be held here.

The suggestion made by your correspondent, "Would it not be better to make a special arrangement with a first-class hotel?" etc., is not only a good one, but doubtless an idea possessed by many members of the Association. Let me, however, say that at this particular season of the year it is impossible to secure, so long beforehand, such accommodation. No hotel here will engage rooms for the forthcoming meeting, while many state they expect numerous demands from former visitors at this season, so that they are unwilling thus early to fix for any number of rooms.

Those having apartments to let as lodgings seemingly show the same feeling, and, so far as my exertions have gone in this direction, I have been very much discouraged.

That it would be a very agreeable thing for our members to congregate in one large hotel is undoubted, but the difficulties ahead may be shortly noticed.

1. Who could tell how many rooms to engage and become answerable for? We have nearly 1900 members, how many will come to Edinburgh?

2. From the middle of the present month on till October the constant influx of strangers to this place is almost inconceivable.

3. Not only do the pharmaceutical gentlemen require accommodation, but the members of the British Association are also expected at this very period in considerable numbers.

Reasons 2 and 3 are as well known to those having rooms to let as to us, and they can therefore be quite independent until nearer the time.

However, I can faithfully promise that if any parties will send me a special request and authority to engage rooms, I will be most happy to do all I can to fulfil their desire, and will get as many in one hotel as I possibly can.

I may mention, in illustration of the difficulty referred to, that one house, having 150 bedrooms to let, on my expressing to the landlord a desire that he would promise me a certain number, replied, "I cannot do this, as we will have more than 150 American visitors just about the very time you would require those rooms."

I may, however, shortly remind those intending to honour Edinburgh on this occasion, that on Tuesday evening we have our conversazione; on Wednesday evening there will be the introductory address of the British Association; on Thursday evening the public dinner of the Conference will take place; while throughout Monday, Tuesday, Wednesday and Thursday the Craigie Hall, 5, St. Andrew Square, will be open from 9 till 6 as a reception room, where some one will be constantly in attendance to give any information which may be required.

JOHN MACKAY, *Hon. Sec.*

119, *George Street, Edinburgh,*
July 11*th*, 1871.

POISON BOTTLES.

Sir,—Seeing in your last issue two letters concerning poison-bottles, each adopting a method of fixing the cork or stopper, I beg to ask how many chemists would take the trouble to remove a fastening before they could get at the contents of the bottle, and the few who would do so, would they all replace it after use? If not, it would be of little value.

I suggest a small bell attached to the neck of each bottle, which would not give extra trouble, and could be seen, felt and heard on taking up the bottle to get at the contents. I hope this suggestion may prove useful from

"ALARM BELL."

THE 'GRAPHIC' ON POISON REGULATIONS.

Sir,—I beg to call your attention to a short article in the *Graphic* of July 8th, respecting a case of poisoning at the Islington Dispensary, in which Kino powder was given for rhubarb and soda. *Mr. Graphic* seems to blame the chemist, and not the dispenser at the dispensary, for not having his packets properly labelled. Are we to put up with this, I ask you? Does not such an article make the public shudder, and drive them from the doors of a chemist, consequently injuring his trade? Ought not *Mr. Graphic* first examine the chemist's drawers, and see for himself if the packets or powders are properly labelled? Or where can he find one chemist in fifty or a hundred who keeps kino powders ready weighed up?

I consider it very hard that chemists should have to carry the cargo of mistakes made in public dispensaries. I think some, at least, of your readers will agree with me. I hope some one more able than I will bring the case before *Mr. Graphic*, and explain to him the difference between a chemist's establishment and that of a dispensary.

Bath, July 10*th*, 1871. "FAIRPLAY."

E. Marshall.—Prussiate of potash is not a metallic cyanide within the meaning of the Act, neither is it a poison.

"*Calyx.*"—'The Journal of Botany, British and Foreign,' edited by Dr. Seemann, assisted by Dr. Trimen and Mr. J. Baker, and published at 10, Little Queen Street, Lincoln's Inn Fields, W.C.

"*Associate.*"—The work is out of print, but second-hand copies may sometimes be met with.

Robert Stewart.—(1.) 'Pharmacopœa Borussica,' editio septima, 1862. (2.) See Vol. I. p. 995.

W. L. Scott.—Our correspondent's letter, as far as we are able to read it, contains nothing beyond what we have already published on the subject referred to.

We are compelled, from want of space, to defer the publication of several communications.

The following journals have been received:—The 'British Medical Journal,' July 8; the 'Medical Times and Gazette,' July 8; the 'Lancet,' July 8; the 'Medical Press and Circular,' July 12; 'Nature,' July 5; the 'Chemical News,' July 8; 'Gardeners' Chronicle,' July 8; the 'Journal of the Society of Arts,' July 8; the 'Grocer,' July 8; 'Produce Markets Review,' July 8; the 'English Mechanic,' July 7; the 'Canadian Pharmaceutical Journal' for July; 'Journal de Pharmacie et de Chimie' for February and March.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. R. D. Mitchell, Mr. J. Birt, Mr. F. V. Ballard, Mr. T. Brewis, Mr. A. W. Postans, Mr. A. H. Mason, Mr. J. Addison, Mr. A. T. Brenner, Mr. E. J. Beale, Mr. M. C. Cooke, Mr. J. Abraham, J. S., W. H. B., S. W. N., T. P. B., C. D. C., E. H., R. S., "Chemicus," "Fair Play," "Theta."

NOTES ON SOME EASTERN VARNISH-TREES.

BY JOHN R. JACKSON, A.L.S.,
Curator of the Museums, Royal Gardens, Kew.

"We sell six sorts of varnish; to wit, the dry varnish, which is made of oil of spike, fine turpentine, and sandarac melted together. The second is white varnish, call'd Venetian varnish, which is oil of turpentine, fine turpentine and mastick melted together. The third is spirit varnish, which is compos'd of sandarac, white karabe, gum elenic and mastick. The fourth is golden varnish, which is of linseed oil, sandarac, aloes, gamboge and litharge of gold. The fifth is China varnish, which is of gum lac, colophony, mastick in tears and spirit of wine. The sixth is common varnish, which is nothing else but common turpentine dissolv'd in oil of turpentine, as observ'd speaking of turpentine before. There is another varnish, some of the religious make; but, as we do not deal in it, I shall not trouble my self or the reader about it. As to the use of varnish that is best known to the workmen, whose business it is to deal in the several sorts, whereby they understand which is the properest for their particular use."

So wrote Pomet in his 'Compleat History of Druggs,' published in 1725. Since that time, we have not only added to the list of compound or manufactured varnishes, but discovered other natural exudations which are generally known as varnishes. Two useful Indian varnish-producing trees are the *Melanorrhœa usitatissima*, Wall., and the *Holigarna longifolia*, Roxb. They both belong to the Natural Order *Anacardiaceæ*. The former is a large, hard-wooded forest-tree, found growing from Tenasserim and Pegu to Munnipore. To collect the varnish with which the tree abounds holes are made in the trunks, and pieces of bamboo, closed at the lower ends, inserted. These bamboo pipes are left for a day or two to fill. The juice, as it flows from the tree, is white, but it becomes black by exposure to the air. In order to preserve it for use it has to be kept in water. It is very extensively used by the natives for varnishing or lacquering all kinds of household articles, furniture, etc. The juice of *Holigarna longifolia*, which is also a large tree, is likewise collected and used as varnish by the natives of Malabar. It is very acid, and, like that of *Melanorrhœa*, will raise blisters or swellings if applied to the skin. Another, and certainly the most interesting, of the Anacardiaceous varnish-producing trees is a species of *Rhus*, a genus of some notoriety, inasmuch as some of the American species, as *R. venerata* and *R. Toxicodendron*, are reputed to have caused such extraordinary effects of poisoning from the mere handling of any portion of the plant, that they have become almost as familiar as the Upas tree of Java. The varnish-producing species to which we have alluded is *Rhus vernicifera*. It is a small tree, native of Japan, and yields, it is said, the best varnish or lacquer, in the use of which the Japanese are, and have been, so famous. The tree is very extensively cultivated in many parts of Japan, and yields, besides varnish, a quantity of wax. One product, however, suffers at the expense of the other, for if the trees are tapped for the sake of the lacquer, which is usually done before they come to full maturity,—some have said at the age of three years,—and which frequently ends in the death of the tree, no wax can, of course, be obtained. In some districts, where a higher value is set upon the wax than upon the varnish, the extraction of the latter is prohibited. At the time of collecting, the varnish is about the thickness of cream, and of a lightish colour, changing to black, and becoming thick by exposure. It is cleared from impurities by straining: at one time very fine paper was used for this purpose.

Of the mode of preparing it for use, nothing certain seems to be known. The old Japanese lacquer ware was far superior to that of the present day, and it is said that the ancient mode of preparation has been lost to the modern Japanese. Some travellers, however, tell us that if the varnish is used in its pure state it is very clear, and every mark or grain of the wood upon which it is laid is distinctly visible; but the natives frequently mix with it other materials, such as finely-ground leaf-gold or pulverized charcoal, which, of course, renders it opaque, and with which they produce various designs. The Japanese use it for varnishing many of their articles of household furniture.

Chapters for Students.

CHEMICAL NOTES TO THE PHARMACOPŒIA.

BY WILLIAM A. TILDEN, D.SC. LOND.
DEMONSTRATOR OF PRACTICAL CHEMISTRY TO THE PHARMACEUTICAL SOCIETY.

LIQUOR CALCIS.

[§ 438 grams require for neutralization at least 20 cub. centims. of the volumetric solution of oxalic acid.]

100 cub. centims. of the volumetric solution are neutralized by $\frac{1}{10}$ of half a molecule of lime, or $\frac{56}{20} =$ 2·8 grams; therefore in 438 grams there would be $\frac{1}{5}$ of this, or ·56 gram of Ca O.

Lime water exposed to the air gives a deposit of carbonate. Very distinct crystals are sometimes produced in this way when, as in an imperfectly-stoppered bottle, the carbonic acid gas has been admitted very gradually.

LIQUOR CALCIS CHLORATÆ.—For the quantitative test, see CALX CHLORATA.

LIQUOR CALCIS SACCHARATUS.

This solution contains 1·54 per cent., or almost exactly twelve times the amount of lime in ordinary lime water. If heated, it deposits a compound of lime and sugar, $3\,CaO\,.\,C_{12}H_{22}O_{11}$, which redissolves on cooling.

LIQUOR CHLORI.

Chlorine gas is generated by the action of hydrochloric acid on black oxide of manganese.

$$MnO\,.\,O + 2\,HCl + 2\,HCl$$
$$= MnCl_2 + Cl_2 + H_2O + H_2O.$$

Chloride of manganese remains in the generating flask. The chlorine gas is passed first through a little water to wash it, and then into the water in which it is to be dissolved. The solution is to be kept in the dark, since under the influence of light chlorine decomposes water, with production of hydrochloric acid and evolution of oxygen.

[§ A yellowish-green liquid, smelling strongly of chlorine, and immediately discharging the colour of a dilute solution of sulphate of indigo. Evaporated, it leaves no residue.] Mixed with iodide of potassium in excess, it gives free iodine, which requires for the discharge of its colour an amount of the volumetric solution of hyposulphite of sodium corresponding to 0·6 per cent. of chlorine.

For a comparison of the properties of chlorine, bromine and iodine, see Vol. I. p. 526.

Equal volumes of hydrogen and chlorine gases weigh respectively 1 and 35·5. Chlorine is therefore a very heavy gas. Its specific gravity, taking air as unity, is $35·5 \times ·0693 = 2·46$. If, therefore, chlorine gas is required, it is usually collected by allowing it to run from the delivery tube into a bottle, from which it displaces the air. Chlorine dissolves in about half its volume of water; with a small quantity it unites to form a crystalline hydrate. Its great affinity for hydrogen causes it to decompose almost all organic bodies by removing that element from them. It combines with an equal volume of hydrogen gas to form hydrochloric acid gas. The combination occurs instantly with explosion when the mixed gases are exposed to sunlight.

Liquor Ferri Perchloridi Fortior.

Iron wire is first dissolved in hydrochloric acid so as to give solution of ferrous chloride.

$$2HCl + Fe = FeCl_2 + H_2.$$

This is filtered, mixed with a further quantity of hydrochloric acid and some nitric acid. The liquid thus obtained is nearly black from the retention of the nitric oxide gas produced by the decomposition of the nitric acid. On boiling briskly there is a sudden evolution of a gas which gives red fumes as it escapes, and the liquid then assumes a clear orange-brown colour.

$$\underset{\text{Ferrous chloride.}}{6FeCl_2} + \underset{\text{Hydrochloric acid.}}{Cl_6H_6} + \underset{\text{Nitric acid.}}{2(NO.O.HO)}.$$

$$= \underset{\text{Ferric chloride.}}{3Fe_2Cl_6} + \underset{\text{Nitric oxide gas.}}{2(NO} + \underset{\text{Water.}}{H_2O} + \underset{\text{Water.}}{H_2O)}.$$

[§ Diluted with water it is precipitated white by nitrate of silver, and blue by yellow prussiate of potash; but not at all by red prussiate of potash.] These tests indicate its character as a chloride and as a ferric salt; the third that it is free from ferrous chloride. It is apt sometimes when carelessly prepared to contain nitrate; this can be destroyed by well boiling with a little more hydrochloric acid.

Liquor Ferri Pernitratis.

Iron wire is dissolved in nitric acid diluted with water so as to moderate the action. The solution is then filtered and made up with distilled water.

The reaction which takes place is as follows :—

$$\underset{\text{Iron.}}{Fe_2} + \underset{\text{Nitric acid.}}{6(NO_3H)} + \underset{\text{Nitric acid.}}{2(NO.O.HO)}.$$

$$= \underset{\text{Ferric nitrate.}}{Fe_2(NO_3)_6} + \underset{\text{Nitric oxide gas.}}{2(NO} + \underset{\text{Water.}}{H_2O} + \underset{\text{Water.}}{H_2O)}.$$

It is therefore parallel to that which occurs in the case of the perchloride.

This solution gives also a blue precipitate of Prussian blue, Fe_4Fcy_3, with yellow prussiate; but no precipitate with red prussiate of potash.

Liquor Ferri Persulphatis.

Sulphate of iron is dissolved in water mixed with the proper quantity of sulphuric acid; to the solution nitric acid is added, and the black liquid boiled till after the disengagement of the nitric oxide gas, the liquid becomes clear red.

$$\underset{\text{Ferrous sulphate.}}{6FeSO_4} + \underset{\text{3 molecules of sulphuric acid.}}{(SO_4)_3H_6} + \underset{\text{2 molecules of nitric acid.}}{2(NO.O.HO)}.$$

$$= \underset{\text{Ferric sulphate.}}{3Fe_2(SO_4)_3} + \underset{\text{Nitric oxide gas.}}{2(NO} + \underset{\text{Water.}}{H_2O} + \underset{\text{Water.}}{H_2O)}.$$

The solution gives the same reactions with the red and yellow prussiate of potash as the two last.

In one fluid-drachm of each of these solutions there are the following quantities in grains :—

Liq. Ferri	Perchlor.	Pernit.	Persulph.
Iron .	10·94	1·82	8·00
Peroxide of Iron (Fe_2O_3)	15·62	2·60	11·42
Approximate ratio—	6	1	4·4

Liquor Hydrargyri Nitratis Acidus.

The mercury dissolved in cold, slightly diluted, nitric acid gives mercurous nitrate.

$$\underset{\text{Mercury.}}{6Hg} + \underset{\text{Nitric acid.}}{6NO_3H} + \underset{\text{Nitric acid.}}{2(NO.O.HO)}.$$

$$= \underset{\text{Mercurous nitrate.}}{6HgNO_3} + \underset{\text{Nitric oxide.}}{2(NO} + \underset{\text{Water.}}{H_2O} + \underset{\text{Water.}}{H_2O)}.$$

And then on boiling the solution with the excess of acid as directed, the mercurous is converted into mercuric nitrate.

$$\underset{\text{Mercurous nitrate.}}{6HgNO_3} + \underset{\text{Nitric acid.}}{6NO_3H} + \underset{\text{Nitric acid.}}{2(NO.O.HO)}.$$

$$= \underset{\text{Mercuric nitrate.}}{6Hg(NO_3)_2} + \underset{\text{Nitric oxide.}}{2(NO} + \underset{\text{Water.}}{H_2O} + \underset{\text{Water.}}{H_2O)}.$$

The B. P. tests indicate that it is a mercuric nitrate (yellow precipitate with potash) free from mercurous salt (no precipitate with dilute HCl).

CUNDURANGO.

BY THOMAS ANTISELL, M.D.

In the month of March of this year, Mr. Flores, Minister of Ecuador at Washington, forwarded a box containing a vegetable medicament which he had received from his government for presentation to the State Department, and requested that some analyses and experiments might be made with it, to test its medicinal value. The samples of the drug were stated to have grown in the province of Loja, Ecuador; and extracts from the official journal accompanied the parcel, showing that great medicinal virtues were attributed to the wood and bark of the tree known as *Cundurango*. The extracts were testimonials from Doctors Cæsares and Eguigureu of that province, as to its great value in cancer, fungus, hæmatodes and constitutional syphilis. These statements were supported by a letter from Mr. Rumsey Wing, the United States minister resident at Ecuador, to Hon. H. Fish, Secretary of State, testifying to the medicinal virtues of the plant as admitted by the natives of Loja, in which he mentions that a decoction of the fruit is known to be a poison, and that the parts of the plants used medicinally are the bark and leaves.

During the month of April a sample of the plant (small branches) was received at this Department from Hon. Mr. Fish, with the request to have an analysis made and reported to him for the benefit of the Ecuador government. Meanwhile, the plant itself had been tried, in the form of a decoction, upon some patients in this city affected with cancer, and with apparently considerable relief to the sufferers.

About one pound and a quarter in weight were received for analysis.

The sample consisted of stem and branches of apparently a shrub, but was unaccompanied by leaf or root, so that the botanical characters of the plant could not be determined.

The stem is woody, and covered by a greenish or ash-grey bark, the former tint being due to the lichens on its surface; the branches are from half an inch to a little over an inch in diameter, averaging about the thickness of the finger; the woody fibre is straw-coloured and brittle, breaking with a sharp fracture; it is almost tasteless, having a slightly aromatic and bitter flavour when chewed.

The bark contains whatever medicinal virtues are in the plant. It is of grey colour, slightly ribbed or fluted longitudinally from unequal contraction while drying on the branch; increasing in thickness in proportion to the diameter of the woody stem, in the thicker branches constituting more than half the weight of the whole, in the thinner somewhat less than half; readily separable from the stem by pounding or bruising, when it comes off in clean longitudinal pieces, brittle in the transverse fracture; of a warm, aromatic, camphor and bitter taste, resembling the cascarilla of the old collections. Under the lens it is readily resolvable into three layers: 1st, the inner layer or cambium of reticular woody tissue, having granules of starch and particles of resin imbedded; 2nd, a middle layer of woody fibre and dotted ducts, resinous particles also in this layer; and 3rd, the cuticular or outer layer of cells, of a brownish colour, and containing colouring matter and tannic acid.

The usual methods of filtration from digestion in the usual solvents, as gasolene boiling at 110°, ether, alcohol, carbon disulphide, water, etc., were adopted.

1. Ratio of bark to wood—

Bark	49·72	Mean of these experiments.
Wood	50·28	
	100·	

2. 100 parts of bark yield—

Moisture at 100° C.	8·
Mineral salts (ash)	12·
Vegetable substance	80·
	100·

3. This vegetable matter was separable into the following:—

Fatty matter soluble in ether, and partially in strong alcohol	·7
Yellow resin, soluble in alcohol	2·7
Gum and glucose from starch	·5
Tannin, yellow and brown colouring matters (extractive)	12·6
Cellulose, lignin, etc.	63·5
	80·

No crystalline alkaloid or active principle was separable by the usual methods of proximate analysis. A plan similar to that used for cinchona alkaloids, and also that by precipitation with diacetate of lead, was tried. By distillation no volatile oil or acid was obtained.

Whatever medicinal virtues the plant may possess must reside either in the yellow resin or in the extractive; the former is soluble in alcohol, and the latter in water. In the watery decoction some of the resin is diffused, but the greater portion of the resin is not extracted by the water. The therapeutic position of the plant, judged from analysis, might be among the aromatic bitters.—*Amer. Journ. Pharm.*

ENGLISH CHLOROFORM IN GERMANY.

BY DR. F. VERSMANN.

Many professors of German laboratories and proprietors of chemical works have adopted the valuable plan of communicating to the journals, from time to time, observations and points of practical experiences made in the course of their investigations; and it would be well if this plan was imitated here, as much labour and trouble may often be saved by this liberal exchange of practical information.

This arrangement, like everything good, is, however, not quite unalloyed, for it sometimes happens that statements are published which are of little use, or which, on examination, are found to be incorrect. The last is the case with a communication in a current number of Buchner's 'Repertorium der Chemie,' and as this special incorrectness bears on an English article, it may not be out of place to rectify it. Mr. E. Schering, in his practical communication, asserts that abroad English chloroform, sp. gr. 1485, is, for anæsthetic purposes, preferred to the German (the Prussian Pharmacopœia prescribes a specific gravity of 1500) because of its greater stability.

According to Mr. Schering, the presumption was natural that the English product had been obtained from chloral, and this idea was actually verified by Mr. Hager's investigation, who found it to be chloral chloroform with an addition of ·75 to ·80 per cent. of alcohol; but not a word is said as to the manner in which this result had been arrived at. Mr. Schering refers his readers to his price list of last year, in which he quotes chloral chloroform, and he informs them that he now keeps an article of sp. gr. 1485, identical with the English, or, according to his own words, adulterated with alcohol.

Mr. Hager actually distinguishes the two preparations; he says, the chloral chloroform becomes slightly coloured on addition of strong sulphuric acid, whereas the pure, obtained from hypochlorite of lime and alcohol, remains colourless.

Another difference is said to be, that ordinary chloroform, on being allowed to evaporate on a watch-glass, gives off, with the last few drops, a distinct foreign smell, indicating the presence of other chlorine compounds, which may be the cause of the ready decomposition of the chloroform when exposed to the light, and this is not the case with the product obtained in the new manner.

The manufacture of chloral in quantities and at a reasonable price, is of so recent a date that it is scarcely necessary to recall the fact that seldom, if ever, the supply of any chemical compound responded so readily to the demand, as with the chloral. The price of chloral hydrate was, at the commencement of last year, 112*s.* a pound; before the year was out it had gone down to 12*s.*, and it is now sold at 5*s.* and even less.

Surely at this time when the hydrate commanded such high prices and the manufacture was in its infancy, no English manufacturer would have dreamt of converting chloral into chloroform, and with the present low prices and the high duty on alcohol, he is all but excluded from the market; it is well known that very nearly all chloral hydrate is imported from Germany, and I believe I am correct in stating that only two English firms do manufacture it in quantities.

Mr. Schering's whole argument necessarily falls to the ground, and for the best of reasons, the manufacture as assumed by him would never pay. It would perhaps have been wiser if he had prided himself upon the purity of his product instead of boasting of selling an adulterated article. His tests are of course worthless, because even less than 1 per cent of alcohol will be sufficient to produce slight coloration with sulphuric acid, but it is scarcely necessary to treat the matter as a chemical question.

FLUID EXTRACTS AND THEIR MENSTRUA.

BY EDWARD R. SQUIBB, M.D.

(*Continued from page 46.*)

Diluted alcohol, as at present officinal, consists of equal measures, at 60° F., of alcohol of specific gravity ·835 and distilled water, and has a specific gravity

at 15·6° C. = 60° F. ·94118.
at 25·2° C. = 77° + F. ·93438.

This, when made from alcohol s. g. ·81674 at 15·6° C.,

requires 100	measures of the alcohol	at 15·6° C. to	
112·54	„ „ distilled water	at 15·6° C. or	
100	„ „ „ „	15·6° C.	
require 88·85	„ „ the alcohol	at 15·6° C.	

Made by weight,

100 parts of the alcohol	require	136·86 distilled water,	
or 100 „ distilled water	„	73·06 alcohol.	
100 „ alcohol, s. g. ·835,	„	119·84 distilled water,	
or 100 „ distilled water	„	83·44 alcohol, ·835.	

One pint of this diluted alcohol

at 10·6° C. = 51° F. weighs 446·30 gram. = 6887 grains.
at 30·6° C. = 87° F. „ 439·69 „ = 6785 „

20° C. = 36° F. 6·61 „ = 102 „

Made with alcohol s. g. ·8208 at 15·6° C. = 60° F.,

100 parts alcohol require 135 parts distilled water, and the s. g. of the mixture

at 15·6° C. = 60° F. is ·941849.
at 25° C. = 77° F. is ·935422, or ·000684 for ca. 1° C.

One pint of this mixture

at 10·6° C. = 51° F. weighs 446·50 grm. = 6890 grains.
at 30·6° C. = 87° F. „ 439·75 „ = 6786 „

20° C. = 36° F. 6·75 „ = 104 „

A mixture of three parts, by weight, of stronger alcohol, and one part glycerine, proves to be a very good menstruum for cinchona and rhubarb, and may be found applicable to other drugs.

Made with alcohol of s. g. ·81674 at 15·6° C.
and glycerine „ 1·2523 at 15·6° C.,

the mixture has a specific gravity

at 15·6° C. = 60° F. ·90050.
at 25° C. = 77° F. ·89296, or ·000802 for ca. 1° C.

One pint of this mixture

at 10·6° C. = 51° F. weighs 427·30 gram. = 6594 grains.
at 30·6° C. = 87° F. „ 419·82 „ = 6479 „

20° C. = 36° F. 7·48 „ = 115 „

The other special menstruum thus far studied by the writer is one that has been found well adapted to wild cherry bark, pareira brava and uva ursi. This is a mixture of two parts stronger alcohol, three parts glycerine, and five parts water. By measure this is very nearly two measures each of the alcohol and glycerine, and four of water.

Made from alcohol of s. g. ·81953 at 15·6° C., and glycerine s. g. 1·2523 at 15·6° C., it has a s. g.

at 15·6° C. = 60° F. 1·03833,
at 25° C. = 77° F. 1·03283, or nearly ·0006 for ca. 1° C.

One pint of this mixture

at 10·6° C. = 51° F. weighs 492·03 gram. = 7593 grains.
at 30·6° C. = 87° F. „ 486·97 „ = 7514 „

20° C. = 36° F. 5·06 „ = 79 „

It appears very probable that special menstrua for special drugs can and should be very much multiplied. Indeed, it may be regarded as almost certain that a proper degree of research would show that every drug requires a special menstruum in order to secure the best results. If there be a rule of any general applicability, it is that for drugs which contain definite alkaloids, the menstruum should be as strongly alcoholic as possible a rule which is in opposition to former practice.

It remains now to notice the prominent fluid extracts with which the writer has had most experience, in detail.

FLUID EXTRACT OF ACONITE ROOT.

Not officinal, but should be, and should always bear a red label. The root should be in very fine powder, and the menstruum stronger alcohol. The officinal quantity of powder requires 5 f℥ for moistening, and the moistened powder should be passed through a sieve before packing. A pint of the menstruum at 25° C. = 77° F., weighs about 5907 grains, and a pint of the finished preparation, at the same temperature, should weigh about 6350 grains, giving a difference of about 440 grains, varying somewhat with the quality of the root and the dryness of the powder.

FLUID EXTRACT OF BELLADONNA ROOT.

Not officinal, but should be, as stronger and more uniform than that yielded by the leaf. The two are not necessary, and if the leaf was dropped, the root would soon go into general use. The fluid extract should always bear a red label.

The root should be in very fine powder, and the menstruum stronger alcohol.

FLUID EXTRACT OF BUCHU, OFFICINAL.

The leaf should be green and fresh, the short buchu the best, and be in very fine powder. Many menstrua tried, with various portions of glycerine and water, but none so good as stronger alcohol. About 8 f℥ required to moisten the powder, which should be passed through a sieve before packing. A pint of the menstruum weighs about 5907 grains, and a pint of the finished preparation about 6677 grains, giving a difference of about 770 grains.

FLUID EXTRACT OF CIMICIFUGA, OFFICINAL.

The root being in very fine powder, the officinal plan yields an excellent preparation by repercolation. The process could, however, be much simplified.

FLUID EXTRACT OF CINCHONA, OFFICINAL.

The bark should be in very fine powder, the menstruum one part glycerine and three parts alcohol, and 8 f℥ should be used to moisten the powder before sifting. Many menstrua were tried with this drug, but none seemed to answer so well as the mixture indicated. With it a fluid extract was prepared of which a minim represented about one and a half grains, and this has now stood more than four months without a deposit. Therefore, a preparation of one minim to the grain, or double the present officinal strength, would probably stand indefinitely, and this change of strength is, in the writer's judgment, very desirable. The details of this percolation are given in the tables. In the management of this drug the weak percolates become overloaded with extract from time to time, but the alcohol can be easily recovered from them without much damage, as the glycerine takes care of the alkaloids and bitter principles.

The writer has found no demand for fluid extract of colchicum root, and believes it to be a useless preparation, while that of the seed is so commonly used, and a more uniform preparation.

(*To be continued.*)

THE THEORY OF DISINFECTANTS.*

BY T. P. BLUNT, M.A., F.C.S.

The light which has recently been thrown upon the nature of contagion and infection by the labours of Pasteur and others, the results of which have been ably summarized by the President of the British Association in his late inaugural address at Liverpool, seems to point the way to clearer and more comprehensive views than those commonly entertained at present regarding the operation of the substances known as disinfectants.

These may be divided into two classes:—1. Those which act by the oxidation and total destruction of the virus contained in infected matters, together with the foul gases which usually accompany it, and which are, in fact, nature's danger-signals of its presence. 2. Those substances which do not possess the active chemical properties of the first class, yet are proved by experience to have a similar power of arresting and checking the spread of infection. The latter are, for the most part, the more ancient and popular, having apparently in some cases been suggested by a just but unreasoning instinct. Thus we find that the use of sulphurous acid, as evolved from burning sulphur, dates even from Homeric days; while the burning of pitch and aromatic gums for disinfectant purposes has an origin at least equally remote.

An attempt will be made, in the course of the observations which follow, to bring the operation of the large majority of the latter class under a general law which shall furnish us with an explanation of their true character. This is especially desirable, since it is to be feared that, for want of such an explanation, many good and valuable disinfectants have been condemned by chemists, on theoretical grounds, as mere deodorizers,—not assailing the virus of infected substances, but rather masking their poisonous character by precipitating their offensive gases. An objection to this view at once meets us, in the utter disproportion between the volume of the gases to be fixed and the quantity of salt practically found sufficient for the object required, while it breaks down altogether when applied to such disinfectants as the new "chlor-alum" or chloride of aluminium of Mr. John Gamgee, or the well-known carbolic acid. Before endeavouring to supply a more probable theory, it may be well to remind you that the researches already mentioned have established the fact that contagion and putrefaction, if not actually identical, are processes so closely allied that they require exactly similar conditions; the latter appearing to consist of a kind of disease propagated from particle to particle of a decomposing substance, and ending in its entire destruction. Hence it may be inferred with perfect safety, that any agent which arrests putrefaction is capable also of abolishing the properties of contagion and infection.

This conclusion at once puts into our hands a valuable instrument of research; for while it is difficult, and often impossible, to investigate directly the disinfectant action of a substance, the inquiry being surrounded by innumerable sources of error, the properties of an antiseptic are perfectly well defined and open to the clearest demonstration. Thus, in the case of the two bodies mentioned above, carbolic acid and chloride of aluminium, the antiseptic action of the first is well known, and has long been usefully applied; while that of the latter is maintained in the most positive manner by its introducer, Mr. John Gamgee, who certainly brings forward overwhelming proof of it in his recorded experiments upon meat and fish; and hence, on the grounds given, we are justified in regarding these substances as good and useful disinfectants. It may be stated, in passing, that the deodorizing power which these and other similar bodies possess is probably due to their antiseptic action; the offensive gases of decomposition being sooner lost by diffusion, and their fresh production being entirely suspended.

Let us now proceed to a consideration of the origin of the remarkable properties which we have described. This appears to have been traced with some degree of probability, in the case of carbolic acid, by Dr. Joseph Hirsch, the writer of an article which appeared in the *Chemical News* about the end of February, 1869. He advances the bold and ingenious speculation, that the disinfectant action of that substance depends upon its power of coagulating albumen. He supposes that the acid finds its way into the minute organisms, which propagate disease by diffusion through their investing membrane; that it coagulates the albumen which they, in common with all germinal matter, contain as a necessary constituent; and thus practically destroys their vitality as perfectly as immersion in boiling water terminates that of an egg.

In order to test the accuracy of the view thus enunciated, I selected a substance of which the albumen-coagulating power was well known, and examined it with regard to its antiseptic, and, therefore, disinfectant properties. The substance chosen was nitro-muriatic acid, which has long been in use as a test for albumen in urine. The experiments were conducted as follows.

a. Two samples of fresh healthy urine, passed at the the same time, each measuring about one ounce, were placed side by side. To one of them six drops of strong nitro-muriatic acid were added. In a few days, the unacidified specimen was covered with a thick crust of mould; while that to which the acid had been added was unaltered, except by a slight darkening of colour and deposition of crystals of uric acid.

b. Some fresh meat was pounded into an emulsion with water,—the whole divided into two equal portions of about six drachms each. To one of them six drops of strong nitro-muriatic acid were added, as in the former case. In a day or two, the unacidified sample was quite putrid and offensive; while that to which the acid had been added retained the smell of fresh meat, and continues to do so still, after the lapse of nearly a month.

I now proceeded to test some of the salts commonly used as disinfectants, with respect to their possession of this power of coagulating albumen. The examination was conducted thus. One part of the salt to be tested was dissolved in one thousand parts of distilled water, and the solution was mixed thoroughly with the fresh white of egg. The salts examined were iron-alum, sesquichloride of iron, common alum, chloride of zinc and nitrate of lead. Coagulation followed immediately in every instance. In one or two cases the dilution was carried much further,—one part of the salt to three or four thousand of water. Here, too, coagulation followed in one or two seconds.

It may be remarked, in passing, that the hæmostatic action of the iron-salts is probably to be attributed in great measure to this faculty of coagulating albumen, exercised upon the serum of the blood.

The attempt to obtain similar results from the sul-

* Read before the annual meeting of the Shropshire Scientific Branch of the British Medical Association.

phites entirely failed. They appeared, indeed, to retard coagulation by other reagents. The coagulating power of sulphurous acid was faint and ill defined.

If we review the evidence now before us, we shall find that it stands thus.

We start with two assumptions,—the first justified by recent research, the second borne out by analogy, viz. that infection results from the transference and development of minute germs; and that these germs contain albuminous matter as a necessary constituent, the coagulation of which terminates their existence. Upon these assumptions we frame our major premiss,—that "all coagulators of albumen are disinfectants;" and, having arrived at this result by a process of pure reasoning, we proceed to prove its truth by experiments upon the antiseptic, and so upon the disinfectant, properties of a well-known albumen-coagulator. Having thus established our fundamental proposition, we produce experimental proof of our minor premiss—that "nearly all the substances to which popular experience has assigned the property of arresting the spread of infectious diseases, where that power is at present unexplained, are coagulators of albumen." The conclusion then necessarily follows, that these substances are disinfectants; and thus a vindication of their efficiency is furnished in those cases where it has been called in question by chemists on the ground that no sufficient explanation of their action had been offered.

The above conclusion does not apply to sulphurous acid and the sulphites. In their case, we must probably look for some more remote physiological effect upon germinal existence.

Note on the Use of Hydrochloric Acid as an Antiseptic.

It is probable that hydrochloric acid, which shares the properties attributed to nitrohydrochloric acid in the foregoing remarks, will be found to be a valuable preservative of animal food. A piece of meat, immersed for fifteen minutes in a mixture of one part of the acid to three of water, remained entirely free from putrefactive change after nearly a fortnight, though the action of the acid was not sufficiently powerful to prevent the appearance of a small quantity of mould. The meat was then immersed in a dilute solution of carbonate of soda, and the superficially absorbed acid was thus converted into common salt. This reaction obviously gives hydrochloric acid a great advantage over other antiseptics, which introduce into the food a foreign substance, inimical by its very nature, in most cases, to the process of digestion.—*The British Medical Journal.*

SOLUTIONS OF ALKALOIDS IN MEDICATED WATERS.

In the July number of the *American Journal of Pharmacy*, Professor Maisch mentions a case that had been brought under his notice, in which a prescription ordering sulphate of morphia dissolved in peppermint water, having been dispensed with peppermint water made according to the United States Pharmacopœia, by triturating the oil with carbonate of magnesia and water, it was found that the sides of the bottle, upon its being brought back for a renewal of the prescription, were covered with crystals. The crystals were collected, and, upon examination, proved to be morphia. He calls attention to the fact that the process of the United States Pharmacopœia, above alluded to, yields in all cases a medicated water having an alkaline reaction, which is shown by the reddish-brown colour produced by it in a diluted solution of turmeric. He says, "If chloride of ammonium and ammonia water are added to such a medicated water, any soluble phosphate will, in a short time, produce a dense cloudiness and finally a precipitate. It is unnecessary to enter into the causes of the solubility of magnesia under these circumstances; the fact is a plain one, and the possibility of dangerous effects very obvious. Neutral salts of insoluble (in water) alkaloids may be dissolved in such medicated waters, but the alkaloids will be gradually precipitated in a form in which they cannot be uniformly diffused in the liquid even by agitation; hence the possibility, if the separated alkaloid does not firmly adhere to the vial, that the last dose may contain an excessive amount of a poisonous article; while, in case it should adhere with sufficient firmness, the result might be, at least, disappointment in the effects, if nothing worse, in consequence of insufficient medication." Professor Maisch thinks that this furnishes an additional and strong argument for the preparation of medicated waters by distillation; and that, where waters prepared from volatile oils by the aid of magnesia are used, it is the duty of pharmacists to neutralize or slightly acidulate them when poisonous alkaloids are to be dissolved therein.

FUNDAMENTAL DIFFERENCE BETWEEN THE STRUCTURE OF ALBUMEN AND THAT OF CASEINE.

BY J. ALFRED WANKLYN.

Among the determinations of the quantity of ammonia evolved by the action of alkaline permanganate of potash on organic substances, Chapman, Smith and myself have already published that caseine yields 7·6 per cent of ammonia, and that albumen yields about 10 per cent. We considered, however, that a result of such importance required confirmation; and refraining from drawing the conclusions legitimately following from it, pointed out that in the instance of the caseine taken for our experiment some further guarantee was desirable. Confirmation has been given; caseine having been shown to yield 6·5 per cent. of ammonia—rather less than before, and, consequently, even further removed from albumen than was at first represented.

In ultimate percentage composition albumen and caseine are indistinguishable. In oxidation products they have, up to the present time, been considered as being alike. Only in some small reactional characters, as, for instance, that the one is, and the other is not, precipitable by acetic acid, had they been distinguished. The difference in the yields of ammonia, which we now insist upon, points to deep-seated difference in chemical structure, and shows that albumen and caseine, which are metameric, and possibly, even isomeric with one another, belong to different chemical families.

Inasmuch as the albuminous compounds of young mammals have necessarily been obtained by metamorphoses of the caseine supplied in the milk which they feed upon, the process of assimilation must consist partly in fundamental chemical change, and not merely in morphological changes and superficial chemical alterations.—*Milk Journal.*

PILL-MASSES FOR PROTOSULPHATE OF IRON AND CARBONATE OF POTASH.

In the *American Journal of Pharmacy*, Professor J. M. Maisch, referring to a combination of protosulphate of iron and carbonate of potash sometimes prescribed in the form of pills, and the various methods proposed for overcoming the hygroscopic tendency of the carbonate of potash, speaks with approval of a suggestion made in the *Pharmaceutische Zeitung* to substitute for the iron sulphate an equivalent quantity of the exsiccated salt, and, after triturating it with the potash salt, to beat it with honey into a mass of proper consistence. The slower solubility of the exsiccated salt would necessarily render such pills slower in their effects, but probably not sufficiently so, he thinks, to be objectionable. He reports that he has obtained excellent results by manipulating as follows:—Sulphate of iron, granulated by precipitation of its solution with alcohol, is rubbed together with the carbonate of potash; the mixture becomes soft and changes in colour, in consequence of the formation of carbonate of iron and the liberation of water of crystallization. Powdered tragacanth is now added, and by beating with a few drops of syrup a very good pill-mass is obtained. The proportions may be seen from the following:—

℞ Ferri Sulphat. pur.
Potassæ Carbonat. pur. aa. ʒij
Pulv. Tragacanthæ ʒss
Syrupi Simplic. gtt. v–vj
M. ft. pilul. No. 60.

Sulphate of iron always gives more or less trouble in the formation of pill-masses with the usual excipients. In many cases a little glycerine will probably be found superior to any other, as is the case with the following prescription, which will give a crumby, unsatisfactory mass with syrup, honey and mucilage, but is unobjectionable when glycerine is employed:

℞ Ext. Nucis Vom. gr. x
Ferri Sulphat. gr. xx
Quiniæ Sulphat. ℈ij
Glycerine, gtt. v–vj
M. ft. pilul. No. 20.

It is remarkable what a large amount of the other excipients the above mixture will take up, while five or six drops of glycerine will have a by far better result.

THE PHARMACY BILL.

NORTH BRITISH BRANCH OF THE PHARMACEUTICAL SOCIETY.

At a meeting of the Council of the North British Branch of the Pharmaceutical Society, Mr. Baildon submitted a motion, which was seconded by Mr. Ainslie, that the Council approves generally of the Amended Bill. The motion was carried, one member only dissenting.

PHARMACEUTICAL AND CHEMICAL ASSOCIATION, SHEFFIELD.

The following letter, submitted to this Society by Mr. G. B. Cocking (Vice-President), and unanimously adopted, has been forwarded to Members of Parliament:—

"*Pharmaceutical and Chemical Association Rooms,*
"*Sheffield, July 14th*, 1871.

"To A. B., Esq., M.P.

"Dear Sir,—At a meeting of the Council of the above Association held last evening, it was resolved to solicit your continued opposition to the 'Act to amend the Pharmacy Act, 1868,' as amended by the Right Honourable W. E. Forster, believing that the objections to the principles contained in the said Act, as already petitioned against by the members of this Association, remain as strong as ever.

"Any protection against poisoning, to be complete or satisfactory, must include the dispensers in private surgeries, public hospitals, infirmaries, parish and other dispensaries, as well as those in 'open shops.' Medical prescriptions are dispensed in private surgeries (for other than private patients) in this and other towns, yet in the amended Act they would be exempt from the poison regulations.

"If the public safety requires any precautionary enactment such as that now proposed, it is certainly desirable and just that all persons, without exception, who keep, sell, or dispense poisons should be equally subjected to any penal restrictions that the Government may adopt.

"The amendments proposed by Mr. W. E. Forster cannot be considered either fair and just to pharmacists or satisfactory to the public, unless the following sentences be eliminated therefrom, viz.:—

"1. In notice of motions, page 1939, 2nd amended clause, 4th line, 'Who keep open shop for the,' the clause then reading thus, '*All* persons retailing, dispensing,' etc.

"2. In 3rd amended clause, 1st line, 'Who keeps open shop for the,' the clause then reading thus, '*Every* person retailing, dispensing,' etc.

"3. Page 1940 (schedule), 2nd line, substitute 'all persons' for 'by persons keeping open shop.'

"With these or equivalent alterations the Act might be considered fair and impartial.

"We are, dear Sir, on behalf of the aforesaid Council,
"Yours respectfully,
"J. T. Dobb, *President*.
"Henry W. Maleham, *Sec.*"

LETTER ADDRESSED TO MEMBERS OF PARLIAMENT.

The following is a reprint of a circular posted to Members of Parliament on Saturday last, and referred to by Mr. Sandford in his letter.*

"*15th July*, 1871.

"Sir,—In 1868, when the Pharmacy Bill was before Parliament, the Pharmaceutical Society had to resist, as strongly as possible, the introduction of restrictive clauses which would have seriously fettered chemists in their daily avocations. This could only be done on the plea that legislators, being utterly unacquainted with the details of the business, were not fairly able to make regulations respecting it, and that chemists themselves were the only fit and proper persons to perform that duty. Acknowledging the force of the arguments used on that occasion, Parliament left the details of the regulations to be observed in the sale and keeping of poisons in the hands of the Pharmaceutical Society and the Privy Council conjointly; the former to initiate, the latter to approve. The Council of the Society, with great care and trouble, framed a code of regulations, simple, practicable, sufficiently elastic as they believed to prevent serious inconvenience, and yet highly conducive to the safety of the public; the regulations were, in fact, taken from the systems of precaution practised in the best regulated establishments. The Society, in whom the power was vested, did not support the views of its Council, and refused by its vote to sanction the recommendation of these or of any regulations for the approval of the Privy Council with the view of their being made compulsory. Thus occasion has been given for the introduction of the Pharmacy Bill now before the House of Commons. That Bill, as it came from the House of Lords, was certainly objectionable in some of its provisions. It gave the Privy Council too absolute power, and left untouched many shops kept by medical men and others, who have special exemptions under the Act of 1868. Mr. Forster's amendments of the Bill will remove both these objections; the first by embodying in a schedule the regulations framed by chemists themselves, thereby relinquishing at once the proposed arbitrary power of the Privy Council; the second by making the provisions of the Bill applicable to all persons who sell or dispense poisons in open shops. Medical practitioners, in the ordinary exercise of their profession, would have perfect immunity from the provisions of this Bill, but in an open shop for the sale and dispensing of medicine, a doctor becomes a retail dealer, and in that shop should conform to rules as other retail dealers. Believing that an early settlement of this question will conduce to the welfare of chemists and druggists, as well as to public safety, *we have presumed to point out to you*

* See p. 79.

how completely the objections to the Bill have been removed, and trust you will support it accordingly.

"We have the honour to be, Sir,
"Your obedient servants,

"Allen and Hanburys, Plough Court, Lombard St.
J. B. Barnes, Trevor Terrace, Knightsbridge.
John Bell and Co., 338, Oxford Street.
W. L. Bird, 42, Castle Street East, Oxford Street.
Blake, Sandford and Blake, 47, Piccadilly.
Bolton and Co., 146, Holborn Bars.
Bradley and Bourdas, Belgravia.
Bullock and Reynolds, 3, Hanover Street.
John Carr, 171, High Holborn.
Corbyn and Co., 300, High Holborn.
Charles Croyden, 37, Wigmore Street.
Darby and Gosden, 140, Leadenhall Street.
J. T. Davenport, 33, Great Russell Street.
Henry Deane, Clapham Common.
Decastro, Watson and Richards, Wilton Place.
Dinneford and Co., 172, New Bond Street.
Robert Fincham, 57, Baker Street.
Fisher and Haselden, 18, Conduit Street.
Godfrey and Cooke, Conduit Street.
William Gulliver, 33, Lower Belgrave Street.
D. R. Harris, 55, St. James's Street.
Hopkin and Williams, 5, New Cavendish Street.
Robert Howden, 78, Gracechurch Street.
W. B. Hudson and Son, 27, Haymarket.
Joseph Ince, 10, Vigo Street, Regent Street.
Jolley and Co., 13, Curzon Street, Mayfair.
A. Maitland, 8, Torrington Place.
John Maitland, 10, Chester Place, Hyde Park.
Morson and Son, Southampton Row, Bloomsbury.
George S. Pedler, 199, Fleet Street.
Robert U. Potts, 26, South Audley Street.
Benjamin Priest, 14, Parliament Street.
Pritchard and Constance, 65, Charing Cross.
Pope Roach, 8, St. James's Street.
John Robbins, 372, Oxford Street.
Savory and Moore, 143, New Bond Street.
P. and P. W. Squire, 277, Oxford Street.
R. W. Thomas, Pall Mall.
Charles E. Turner, 63, Great Russell Street.
C. H. Warner and Son, 55, Fore Street.
J. Watts and Co., 217, Edgware Road.
George Waugh and Co., 177, Regent Street.
Williams and Elvey, 8, Halkin Street West.
Yarde and Son, 60, Lamb's Conduit Street.

"*Banbury*, Thomas Beesley.
Bath, John C. Pooley.
Bedford, J. M. Cuthbert.
Bewdley, Robert Newman.
Birmingham, Southall, Son and Dymond.
Bodmin, J. D. Williams.
Bradford (*Yorkshire*), Michael Rogerson; F. M. Rimmington; Joseph Hick.
Bridport, James Beach; Charles Tucker.
Brighton, Thomas A. Brew.
Bristol (*Clifton*), Giles and Son.
Buxton, A. Barnett.
Cardiff, Francis William Joy.
Carlisle, William Moss; J. Hallaway.
Cheltenham, Nathaniel Smith.
Chester, Charles A. Bowles; David and Shepheard; William Hodges; William Higgins.
Cirencester, Thomas Skinner.
Croydon, R. C. Crafton.
Dartford, George Edwards.
Eastbourne, Henry Robert Browne.
Falmouth, Walter F. Newman.
Frome, William B. Harvey.
Gosport, John Hunter; Charles Mumby.
Grantham, Richard Gamble.
Gravesend, W. H. Beaumont.
Harrogate, Joseph Coupland.
Hastings, Frederick Rossiter.
Ipswich, J. Wiggin.
Kidderminster, Charles Bond.
Liverpool, Clay and Abraham.
Ludlow, George Cocking.
Lymington, Adam U. Allen.
Lynn, George Atmore.
Norwood, H. C. Birch; J. H. Baldock.
Pembroke, D. W. John.
Plymouth, A. P. and G. Balkwill.
Poole, William Penny.
Preston, William Houghton.
Ramsgate, Henry Morton.
Richmond (*Surrey*), Hopwood and Son.
Ruthin, J. J. Bancroft.
Sheerness, William Rayner.
Southampton, W. B. Randall.
South Shields, Robert J. J. Mays.
Stafford, John Averill.
Stoke-on-Trent, J. H. Adams.
Stourbridge, John H. Bland.
Swansea, Thomas Brend.
Taunton, Henry Prince.
Tenby, M. P. Davies.
Tenterden, Stephen H. Willsher.
Torquay, Edward Smith.
Tunbridge, Lewis M. Wibmer.
Tunbridge Wells, C. Gardener.
Wakefield, John Taylor.
Wandsworth, George Nind.
Wednesbury, Samuel J. Gittoes.
Welshpool, Thomas K. Williams.
Weymouth, Thomas B. Groves.
Worcester, Thomas Witherington."

Since the above circular was issued the following additional signatures have been received:—

Butler and Crispe, Cheapside.
Robert Hogg, Albion Place, Hyde Park Square.

Banff, Bartlet Ellis.
Birmingham, C. J. Arblaster; J. Churchill and Sons; Stirling Grieves; Walter R. Jones; Joseph Lucas.
Brighton, J. Schweitzer.
Cockermouth, Joseph Bowerbank.
Edinburgh, John Mackay.
Exeter, George L. Napier.
Grantham, William Whysall.
Leith, Thomas Finlayson.

METROPOLITAN CHEMISTS' DEFENCE ASSOCIATION.

At a meeting of the Committee, held at Freemasons' Tavern, July 18th, the following resolutions were unanimously adopted:—

Proposed by Mr. Urwick, seconded by Mr. Vizer—

"That the Chairman be requested to express to W. T. M'Cullagh Torrens, Esq., M.P., the special and sincere thanks of this meeting for his valued services which have resulted in the withdrawal of the Pharmacy Bill."

Proposed by Mr. Greenish, seconded by Mr. Pattison—

"That this meeting desires to express its sense of obligation to Jacob Bright, Esq., M.P., for his cordial assistance in resisting the Pharmacy Bill."

Proposed by Mr. Urwick, seconded by Mr. Hemingway—

"That the Chairman be requested to thank Dr. Brewer, M.P., for the step he has taken in connection with the Pharmacy Bill."

Proposed by Mr. S. C. Betty, seconded by Mr. Bland—

"That this meeting tenders its hearty thanks to all those Members of Parliament through whose influence and services the Pharmacy Bill has been successfully opposed." EDWIN B. VIZER, *Honorary Secretary*.

The Pharmaceutical Journal.

SATURDAY, JULY 22, 1871.

Communications for this Journal, and books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE PHARMACY BILL.

ALTHOUGH the withdrawal of this Bill was received with general approval in the House of Commons on Monday evening, we cannot avoid expressing regret that it was not then dealt with more definitively than by withdrawal, to which even important measures are subject at this stage of the Session, and more especially under existing circumstances.

We regard it as a misfortune that this question should still be left unsettled, for the letters and other documents we publish to-day in reference to the subject of poison regulations sufficiently show that the result will be a continuance of conflict. Those who are more or less favourable to compulsory regulations are evidently aggregating together, and making use of the example set by the opponents of the Bill. If they continue to do so with anything like the energy and activity manifested by those who have opposed the Bill there is every reason to anticipate that the contest is by no means at an end. We cannot hope to take leave of this Bill by endorsing on its history *requiescat in pace*, and must be content to regard the next few months rather as an armistice, during which it will be the duty of every one connected with British Pharmacy, whether directly or indirectly, to consider well and seriously how much he may be disposed to yield of that which, in the heat of controversy, may have seemed to him indispensable.

We would suggest that the time for discussion is now past and that its continuance might only serve to aggravate an antagonism, which is far from being conducive to the advancement of pharmaceutical interests. It is, we think, rather by individual reflection on all the circumstances bearing on the object of the Bill, and by conference between the several members of the trade, that we should be disposed to hope for such a result being arrived at as would satisfy all, and admit a possibility of united action between the Society and the Privy Council in reference to the very difficult question of poison legislation.

Above all things we would urge upon those who may not hitherto have adopted the precautions recommended by this Society in regard to the storing of poisons, that they should at once remove all ground for complaint on this score, and that according to their particular circumstances, they should give the fullest possible effect to the recommendations issued by the Council.

THE SCOTT CENTENARY.

THE members of this year's Pharmaceutical Conference will find their place of meeting unusually attractive. In addition to the natural beauty of Edinburgh, and its attractions, particularly in early autumn, the SCOTT commemoration will afford them an altogether exceptional opportunity, not only of seeing and listening to some of the most distinguished noblemen, statesmen and *littérateurs* of the land, but also of witnessing a collection of works of art unique in its kind. On Saturday, the 15th inst., was opened, under the auspices of Sir WILLIAM STIRLING MAXWELL, the SCOTT exhibition of pictures and art treasures illustrative of the novels, poems and miscellaneous works of the "great wizard of the North." Probably no one but Sir WILLIAM could have commanded, from the numerous possessors of these treasures, such a hearty and simultaneous response to his appeal for a month's loan of them. The catalogue, just issued, will give some notion of the variety, rarity, and beauty of the collection. A finer or more effective commentary on the works of a man of creative genius was never brought together, except perhaps the DANTE exhibition during the commemoration at Florence in 1865. And if, in addition to their inspection of these art treasures, the members of our Conference attempt a "raid" into the "land of SCOTT," whether on the borders or in the highlands, they will have more than ordinary reason to congratulate themselves on the errand which brought them to Edinburgh in August, 1871.

We learn there is now every prospect of Parliament House being obtained for the reception-room of the British Association. Soirées will be held on the evenings of Friday, August 4, and Tuesday, August 8; on Thursday evening, August 3, there will be a discourse by Professor ABEL, On some recent investigations and applications of explosive agents; and on Monday evening, the 7th, there will be another discourse by Mr. E. R. TYLER, on The relation of primitive to modern civilization.

It is proposed to have excursions on Thursday, the 10th, to the coast of East Lothian and Berwickshire, under the superintendence of Professor GEIKIE; to the top of Ben Ledi, under Professor BALFOUR, and a dredging expedition to the Bass Rock, under Professor WYVILLE THOMSON. Other excursions are proposed to Dalmeny and Hopetown House—to Roslin and Hawthornden—to Abbotsford, Melrose, and Dryburgh, and to the Pentlands, including Messrs. COWAN's paper works.

SCIENCE AT CROSS PURPOSES.

IT has long been alleged as one of the chief advantages of such annual *réunions* as the British Association that they bring together representatives of every department of the same field; that they afford opportunities, not otherwise available, for certain scientific interests to make themselves seen, or heard, or felt, in presence of their neighbours; and that thus there is promoted a mutual respect among the sciences which goes far to neutralize the narrowness and self-sufficiency inseparable from the growing system of division of labour. This advantage has, of late years, been much enhanced by the meeting, within a few days' interval, of other scientific associations besides the British; for example, the Medico-Psychological, the British Medical, the Social Science, to say nothing of our own annual Conference held simultaneously with the British Association. N. M., the *savant*, whatever may be the subject of his special cultivation, has thus been enabled to pass from meeting to meeting to enjoy the discussion of questions in which, though not directly interested, he can yet find the recreation which every fresh subject, scientifically handled, never fails to afford. With the view of facilitating this pleasurable transition from Association to Association, their promoters have generally fixed the scene and date of meeting within a brief space, whether in time or distance, of each other, so as to reduce to a minimum the fatigue and expense of making the "scientific round." This year, however, by a singular and, we hope, accidental, conflict of arrangements, it will be wholly impossible for the visitor at one meeting to be present at another, and for the elementary reason that the same body cannot be in two places at the same time. The British Association meets at Edinburgh on the 2nd prox., and its sittings may be attended along with those of the Pharmaceutical Conference, and, by special arrangement, with the magnificent celebration to be held there on the 9th. So far so good. The attractions to the "grey metropolis of the north" will be stronger this year than they are likely to be for the remainder of the century, and representatives of every scientific, literary or æsthetic interest will meet on a common ground very rarely presented to them. The medical man, whether his speciality be physic or surgery or psychology, is not likely to deny himself the opportunity of enjoying within the first fortnight of August "the feast of reason and the flow of soul" awaiting him in the British Association, the Pharmaceutical Conference and the Scott Centenary. But, by the want of foresight or worse, of the committees of the Medico-Psychological and British Medical Associations, not only members of his own but of other professions can do so only at the sacrifice of attendance at those bodies,—the Medico-Psychological assembling in London, under the presidency of Dr. Maudsley, on the 4th prox., and the British Medical, under the presidency of Mr. Whipple, on the 8th at Plymouth! Surely this is a great and altogether gratuitous *fiasco*. The holding of the British Association at Edinburgh, the Medico-Psychological in London, and the British Medical at Plymouth, either simultaneously or within a few hours of each other, so far from facilitating that transition from one to the other hitherto so agreeable and profitable, will simply lead to comparisons proverbially odious, and to preferences not very flattering to the two malopportune meetings at London and Plymouth.

PETROLEUM TESTING.

In an article on this subject which we published last week, Professor Attfield does good service in distinctly pointing out that in regard to any sample of the hydrocarbon oil, now popularly classified under the name "petroleum," the coincidence of the "flashing-point" with the standard fixed by law is a matter dependent on the circumstances under which the test is applied. This fact has long been well known to those engaged in testing such oil, and it has been equally well known that the result of testing would be above or below the standard, according to the way the test was conducted. It is to this circumstance that the troublesome discrepancies may be referred which have perplexed magistrates and annoyed dealers, and we are glad to see the fact plainly stated. To any one desirous of testing oil fairly, there is no difficulty in obtaining a proper result, and there is no special virtue in any one form of apparatus. All that is necessary is clear definition of the conditions under which the test is to be made, and uniform adherence to them in making the test.

At the meeting recently held in the City it was apparent that there may be still some reason to fear discrepancies in the results of testing with a covered vessel, for a report was produced from three chemists declaring that the average difference between the results obtained with the old test and the new one was less than fifteen degrees, and this was immediately confronted with another report from three other chemists, declaring the difference to be over twenty-five degrees.

It is much to be regretted that the production of such conflicting testimony from scientific men should be possible.

SICK AND WOUNDED.

The Society for the Aid of the Sick and Wounded in War has been vying with the medical profession in doing honour to to the delegation of the "Ambulances de la Presse," charged with the thanks of the French nation for the sympathy and support accorded to it by England during the late struggle and its disastrous sequel. At Greenwich on Saturday, Colonel Loyd Lindsay entertained a brilliant company assembled in honour of Dr. Ricord, Dr. Demarquay, Count Flavigny, and Count Leruier, the representatives of the "Ambulances de la Presse." Count Bernstorff was among the guests, and spoke with a heartiness which must go far to soothe the jeabusy of France, whose mortification, by the way, has found vent in abuse not only of the Prussians for their success, but of the English for their impassiveness. Captain HENRY BRACKENBURY described with much pictorial power the privations encountered by the servants of the "Red Cross," whose achievements, though hardly less dangerous, were by no means so dazzling as those of the belligerents. An interesting letter from Miss NIGHTINGALE, read at the close of the evening, held out encouraging prospects for the efficiency of the International Society in the event of another war on an equal scale. At Willis's Rooms, Sir WILLIAM FERGUSSON presided on Tuesday at a banquet given to the French delegates. Dr. RICORD, who spoke in English, made a really brilliant speech, in eulogy of English medicine, its masters and its dispensers. Dr. DEMARQUAY followed, in French, with felicitous effect; while Dr. GULL brought the evening to a satisfactory termination by proposing the "war correspondents," and in the course of his speech paid a well-deserved tribute to the energy and success displayed in organizing the reception of the deputation by Mr. ERNEST HART.

IMAGINATIVE SCIENCE.

THE forebodings evidently entertained by Professor TYNDALL that some of the propositions laid down in his recent lecture on the above subject would be disputed have proved to be correct, the lecture having received rather severe criticism at the hands of some of our medical contemporaries.

Thus the *British Medical Journal*, while expressing a disposition to welcome such contributions as so able a physicist as Professor TYNDALL can make to medicine in the shape of that exact scientific observation which is the surest basis, points to the circumstance that the Professor's striking experiments have not added anything to our knowledge of the chemical or biological relations of those airborn particles we knew to be ubiquitous even before he illuminated them with the electric beam. Besides this, it is objected that he starts mainly from information derived from chance communications, and then proceeding to reason upon the subject, arrives, by a flight of imagination, at conclusions which are sometimes singularly at variance with facts; as, for instance, when he declares that the most successful workers and profound thinkers of the medical profession are daily growing more and more convinced "that contagious disease generally is of the same "parasitic character as the silkworm disease, called "*pébrine*."

The *Lancet*, also in referring to the note from Mr. ELLIS, quoted by Professor TYNDALL (p. 5), confesses to having entertained a lingering hope that the learned Professor, when he cited and supported such a statement, was amusing himself by an experiment on the credulity of his audience, for such a supposition was less painful than to imagine that one who has climbed the heights of physical philosophy could be so easily misled. It continues:—

"Every one who has ever seen a blister knows that the stretched cuticle, when punctured, does not at once apply itself completely to the surface that it previously covered, but falls more or less in folds, leaving spaces which air must occupy,—carrying with it whatever 'it contains.' Every one who has ever vaccinated knows, also, that in the ordinary methods the entrance of air is prevented by the effusion of blood, which immediately dries into a crust, and hermetically seals the solution of continuity below. Mr. ELLIS's blister must distinctly tend to promote the contact of air with the fluids of the body. His assertion that the occurrence of secondary abscess is by no means uncommon, and his suggestion that his own experience is exceptional in that he has had no such occurrence 'out of hundreds of cases' are alike in direct opposition to facts within the knowledge of every practitioner. If Professor TYNDALL has only such buttresses as these for the doctrines to which he has committed himself, he would do well to lay aside his endeavours to promulgate them.

"From vaccination Professor TYNDALL goes on to speculate upon other questions of medical experience, and to treat of specific contagion generally, in its relation to the derivation of all life from pre-existent life. He here defends himself from an imaginary charge of stepping beyond his *métier*, and does so on the plea that he is not writing a prescription, nor seeking to draw any conclusion from the pulses or tongues of his audience. Such a limitation or description of the sphere of medical duties would be intelligible if it proceeded from the lips of a monthly nurse; but a man of science ought to entertain a different view of the functions of a physician, just as a man of even ordinary discretion might feel some misgiving about his fitness to appreciate the data offered by studies quite foreign to those in which he is accustomed to engage. Before Professor TYNDALL can hold his own in biological investigations, he must find a new balance in which to weigh the value of the statements made to him by those whom he puts forward as authorities.

"Our reference to statements makes it worth while to point out that Professor TYNDALL appears to be desirous of introducing a new nomenclature, which he has not yet made clear by definitions. We have already seen that he advances Mr. ELLIS's 'facts' in order that they may be sifted, and challenged if they be not correct. He refers to the advocates of spontaneous generation as dealing in '*dubious facts* and defective logic.' Now it is really worth while to consider for a moment what must be the state of mind of a lecturer who speaks about 'dubious facts,' and who proposes certain other facts as proper subjects for the operation of sifting, by which, it seems, they may be found not to be 'correct.' We can form no conception whatever of what Professor TYNDALL means either by a correct fact or by a dubious one. The conclusion of the lecture was devoted to a description of an improved respirator, intended to enable its wearer to breathe safely in a burning house; and here Professor TYNDALL, dealing with questions which he has made his own, found himself once more on firm ground, and was able fully to sustain the reputation that at first he had so gratuitously endangered."

ACCIDENTAL POISONING.

IN reference to the case reported and commented on by us the week before last, the *Graphic* has the following remarks, which show that the writer was not only misinformed as to the facts, but is also under very erroneous impressions otherwise:—

"An Islington jury has this week expressed the opinion that chemists and dispensers of medicines generally should be compelled to keep all poisonous packets in paper of a distinct colour reserved expressly for that purpose. The suggestion is a simple one, and the facts which give rise to it certainly warrant a suspicion that there is something wrong in the internal economy of these gentlemen's establishments. It appears from evidence given that it is the custom at the Islington Dispensary to keep powders in a drawer containing sixteen divisions. Every one of those divisions has a label; but the slightest error in assigning the powder to the proper place is, of course, likely to lead to unfortunate consequences. In addition to this it is stated to be the custom at Islington to keep 'kino powders,' which are composed of opium, in the very next compartment to one containing very harmless packets of rhubarb and soda, and so it happened the other day that the apothecary made a little mistake, and the result was that two children of a Mrs. Ford were subsequently found dead in their bed. As the apothecary had clearly no intention to take the lives of Mrs. Ford's children, a verdict of death from accidental causes was agreed upon; but it is certain that if some very simple precautions had been adopted the victims of this accident would have been still alive. There is, we believe, a Society of Chemists and Druggists who are very conspicuous at times in urging upon the Legislature the necessity of forbidding anybody to prepare prescriptions who has not passed an examination in Horace and Virgil; but it would, perhaps, be more to the point if they joined in recommending the trade to make some little distinction between the external appearance of harmless and poisonous powders."

We presume the Pharmaceutical Society is here referred to, but our contemporary does not appear to be aware that the object of the Pharmaceutical Society, in its long-continued efforts to ensure the competence of dispensers, was mainly one conducive to the public interest, or that those efforts—now seconded by law—have been the means of inducing chemists to adopt, more generally than was at one time the case, precautions calculated to prevent the possible substitution of a poisonous drug for a harmless one. In this respect, therefore, his strictures are altogether inappropriate; and as regards the particular case of mistake referred to, he seems to have overlooked the fact that it occurred at a dispensary, and not in a chemist's shop. We hope it would now be very unusual to find a chemist's shop where "kino powders" and packets of rhubarb and soda were kept in such careless proximity that one could be readily mistaken for the other.

Dr. J. Baker Edwards, Ph.D., F.C.S., formerly a member of the Council of the Pharmaceutical Society of Great Britain, has been appointed Professor of Chemistry and Microscopy in the Medical Faculty of Bishop's College University at Montreal. The University has also conferred upon him the degree of D.C.L. *honoris causâ*.

At Brighton a numerous committee has already been formed to make arrangements for the reception of the British Association in 1872. Steps are being taken to secure the attendance of as many foreign *savants* as possible.

MNEMONIC STIMULANT.

A German philosopher has said "ohne Phosphor kein Gedanke" (without phosphorus there can be no thought), and one of his countrymen appears to have taken advantage of the statement, and turned it to practical account. We see the *British Medical Journal* reports that—

"A person named G. M. Raufer puffs and sells for three shillings, under the name of 'lemonade for strengthening the memory,' a fluid mixture of about 30 grammes, containing 15 parts of phosphoric acid, 15 of glycerine and 70 of water. This is sold in Vienna."

We think if there be any reality in the virtues alleged to be possessed by this preparation, that it might indirectly be a source of great relief to Lord Chief Justice Bovill, the Solicitor-General, and all concerned in the case of Tichborne *v.* Lushington; that is to say, provided the claimant could be induced to put himself under a course of it.

The Chemical Section of the British Association will be presided over by Professor Andrews, of Belfast. The Vice-Presidents will be Professors Anderson and Brazier, and the Secretaries, Messrs. J. G. Buchanan, A. Vernon Harcourt, and T. E. Thorpe.

The American Pharmaceutical Association will hold its nineteenth Annual Meeting in the city of St. Louis, Missouri, on Tuesday, the 12th of September next. Arrangements are being made for an extensive display of objects in any way connected with pharmacy, and a special appeal is issued to obtain specimens of crude drugs indigenous to the south and west, so that the materia medica of the great valley of the Mississippi may be efficiently represented.

We are informed in *Nature* that the meeting of the American Association for the Advancement of Science will be commenced at Indianopolis, Indiana, on the 17th of August, under the presidency of Professor Asa Gray.

Professor Attfield's paper on the "Chemical Nomenclature of the Pharmacopœia" is the subject of a review in the *American Journal of Pharmacy*, in which an approval is expressed of the suggestions made in the paper. The reviewer concludes by saying, "Our views coincide in principle with those advanced by Professor Attfield, and we heartily commend them to the consideration of the committee having in charge the revision of the United States' Pharmacopœia."

Transactions of the Pharmaceutical Society.

EXAMINATION IN LONDON.

July 12th, 14th and 19th, 1871.

Seventy-nine candidates were examined,—nineteen Major and sixty Minor; the following passed, and were declared duly qualified for registration:—

MAJOR (as Pharmaceutical Chemists).

- *Davenport, Horace .... London.
- *Iredale, Thomas .... Leeds.
- *Parker, John Samuel .... Peterborough.
- *Bateman, John Montague .... Canterbury.
- Goodwin, Felix .... Newark.
- Wilford, Josiah .... Newport Pagnell.
- Hackett, John Henry .... Lincoln.
- Cole, Walter Benjamin .... Weymouth.
- Fegan, John .... Exeter.
- Stoakes, Benjamin Maidens .. Boston.
- Tomkins, Henry .... Bedford.
- Holmes, Nathaniel Wheatcroft. Grantham.

MINOR (as Chemists and Druggists).

- *Webster, John .... Market Deeping.
- *Ward, John James .... Newark.
- *Kirby, Frederick .... Bridgnorth.
- *Wade, James Henry .... London.
- Shillcock, Arthur .... London.
- Watts, Joseph, jun. .... Attercliffe.
- Heppell, James .... Forest Hill.
- Harrison, William Hopper .. Barnstaple.
- Bryars, William Hudson .... Goole.
- Fortnam, Frederick Henry .. Willenhall.
- Equal.
  - Dunn, Frederick Edwin .... Uttoxeter.
  - Evans, Thomas .... Salford.
- Cowgill, Bryan Horatio .... Manchester.
- Equal.
  - Bradley, John .... Leeds.
  - Bowers, Joseph William .... Olney.
- Ellis, George .... Southport.
- Equal.
  - Banks, Edward .... Salford.
  - Collins, Martin Austin .... Chertsey.
  - Sandy, Frederick William .... Strood.
- Carrington, Edward Green .... Bakewell.
- Equal.
  - Brown, George .... Retford.
  - Pollard, William .... Leeds.
- Emson, William Nicholls .... Dorchester.
- Knowles, William Edward .... Dewsbury.
- Baldwin, Edwin .... Bury St. Edmund's.

The above names are arranged in order of merit.

FIRST, OR PRELIMINARY EXAMINATION.

Two hundred and eighty-seven candidates presented themselves for this Examination on the 3rd July; the following one hundred and ninety-nine passed, and were declared to be duly qualified to be registered as

APPRENTICES OR STUDENTS.

- Royle, John Frederick Sharpe.. Norwich.
- Davies, Walter Lewis .... Stroud.
- Equal.
  - Alderslade, William .... London.
  - Tocher, John .... Aberdeen.
- Crew, William Thomas .... Manchester.
- Emms, William Robert .... Tetbury.
- Hill, Ernest .... Weymouth.
- Equal.
  - Harpham, John .... Newark.
  - Harrington, John S. .... London.
- Newbury, Samuel .... Dorking.
- Lewis, Jenkin .... Droitwich.
- Equal.
  - Davies, Evan .... Birmingham.
  - Hunt, Freeman William .... London.
- Lewis, David .... Merthyr Tydvil.
- Equal.
  - Bullen, George William .... Newark.
  - Lea, Harry .... Ellesmere.
- Gardner, James Richard .... Devonport.
- Equal.
  - Hurran, James .... Leicester.
  - Knight, John Hughes .... Bath.
- Green, William .... Southsea.
- Pass, William John Warhust.. Bury.
- Equal.
  - Atmore, Edward Alfred .... King's Lynn.
  - Broughton, Thomas .... Manchester.
- Equal.
  - Arblaster, Charles .... Birmingham.
  - Cumming, James .... Camberwell.
  - Gulliver, George Ekins .... Holdenby.
  - Williams, John .... Birmingham.
- Equal.
  - Barling, Gilbert Harry .... Manchester.
  - Stone, Edward Ansell .... Oxford.
  - Thomas, Harry .... London.
- Equal.
  - Cobb, Frederic .... Hull.
  - Horsman, Arthur .... Manchester.
- Nicholls, Alfred .... Penzance.
- Equal.
  - Edward, William Wales .... Aberdeen.
  - Lee, Joseph .... Southport.
- Equal.
  - Appleton, Arthur James .... Sheffield.
  - Inglis, James .... London.
  - Wrighton, T. Henry Garland.. Birmingham.
- Equal.
  - Gould, William Robert .... Southsea.
  - Griffiths, Wm. Judge D'Arcy.. Swansea.
  - Widdowson, Reuben .... Nottingham.
- Equal.
  - Stevens, Joseph .... London.
  - Wylde, John .... London.
- Equal.
  - Cassells, Thomas .... Lanark.
  - Davey, John Trimble .... Exeter.
  - Rose, Alfred Wells .... Southwark.
- Equal.
  - Archbold, James John .... Alnwick.
  - Farnsworth, William .... Alfreton.
  - Rundle, Charles .... Plymouth.
  - Smith, Alfred .... Nottinghnm.
- Equal.
  - Chappell, Frederick Abel .... Rochford.
  - Earp, Francis Salsbury .... Battersea.
  - Hatch, James Oliver .... Lancaster.
  - Peck, Edward .... Ely.
- Anderson, George Watson .... Forres.
- Price, John .... Swansea.
- Equal.
  - Appleton, Thomas Alfred .... Brompton.
  - Bond, Alfred .... Manchester.
  - Gardner, William .... Barnard Castle.
  - Moore, John William .... Northampton.
  - Nicholls, Theophilus .... Mitcham.
- Equal.
  - Belton, Richard Headley .... Boston.
  - Cook, Robert .... Great Grimsby.
  - Price, David .... Llandilo.
  - Tearle, Walter .... Ilfracombe.
- Equal.
  - Bartlett, Samuel .... London.
  - Wimble, Frederick .... Birmingham.
  - Woodcock, John Henry .... Manchester.
- Budden, George Alfred .... Wareham.
- Equal.
  - Dear, James Edward .... St. John's Wood.
  - Gwynne, David William .... Swansea.
- Equal.
  - Brown, John Ephraim .... Grantham.
  - M'Farlane, Peter .... London.
- Lester, Henry .... Northampton.
- Equal.
  - Attrie, William .... Southampton.
  - Betts, Samuel .... Leicester.
  - Starkey, George Thomas .... Stratford-on-Avon.
- Equal.
  - Allen, Joseph John William .. Haverstock Hill.
  - Creswell, Alfred Henry .... Clun.
  - Webster, John .... Market Deeping.
- Lawson, John Robert .... South Shields.
- Equal.
  - Anthony, David .... Cardiff.
  - Clark, John .... Dumfries.
  - Fingland, William .... Wavertree.
  - Hudson, Frank .... Clitheroe.
  - King, William Barnham .... Lancaster.
  - Preston, Alfred Charles .... London.
  - Shillcock, George .... Bromley.
  - Tharle, Charles Albert .... Ventnor, I. of Wight.
- Equal.
  - Smith, Alfred Lambert .... Birmingham.
  - Stevenson, Henry Ernest .... Southport.

* Passed with honours.

Equal.
Cheetham, Frank .... Southport.
Culverwell, John Sayer ...... Windsor.
M'Chesney, William James .. Chesterfield.

Gray, Isaac Henry .... Nottingham.

Equal.
Beverley, Robert Henry ...... Nottingham.
Hartridge, James Hills ...... Woodbridge.
Shuffrey, John Clement ...... Hampstead.
Thomas, David .... Llandilo.

Cooper, Albert Henry .... Walmer.

Equal.
Cocker, Justus John .... Over Darwen.
Jones, Thomas M. .... Stafford.
Lathbury, Charles John ...... Nottingham.
Thomas, Llewellyn .... Swansea.

Equal.
Bishop, Richard .... Lynn.
Evans, William Clement ...... Aberdeen.

Equal.
Linley, Frederick William .... Warrington.
Landell, John Tyack .... Wellington.
Smith, Harry Hardisty ...... Leeds.

Equal.
Cliff, James .... Wakefield.
Grace, Charles .... Hammersmith.
Walmsley, Robert .... Clitheroe.

Equal.
Adair, Robert Graham ...... Waltham Abbey.
Otley, John .... Sheffield.

Equal.
Allen, John .... Lancaster.
Beale, James Hawkins Tizard . London.
Colman, Walter John .... Swansea.
Flower, Henry William ...... Derby.
Hobbs, Thomas Henry Hurle .. Wells.
Simpson, William .... Beverley.

Equal.
Hall, J. G. .... Barnard Castle.
Higginson, Alfred .... Manchester.
Taylor, Frederick Gordon .... Bristol.

Equal.
Campbell, Robert Saul ...... Manchester.
Fletcher, Redfern .... Newcastle-on-Tyne.
France, Joseph .... Rotherham.
Hawling, William Henry .... Spilsby.

Equal.
Evans, David .... Windsor.
Hindle, John .... Gorleston.
Skelton, John Hardy .... Gainsborough.

Equal.
Ballard, Frank English ...... Aylesbury.
Gosney, Charles Frederick .... Crewkerne.

Equal.
Askew, Charles .... Jarrow-on-Tyne.
Cryer, Thomas May .... London.
Longbotham, Alonzo .... Ripon.
Smith, Nathan .... Lynn.
Tully, John .... Brighton.
Whitrod, Henry Frederic .... Diss.

Equal.
Ashworth, Amos .... London.
Lloyd, David .... Merthyr Tydvil.
Lund, William Wallace ...... Heywood.

Equal.
Chapman, Josiah Thomas .... Manchester.
Holmes, Alfred John .... Preston.
Smith, Henry Ewbank ...... Barnard Castle.
Wild, John .... Bury.

Heap, Francis .... Tunstall.
Whitgreave, Frederick ...... Kirkham.

Equal.
Ward, Henry Singleton ...... Preston.
Williams, David .... Pembroke Dock.

Mence, William Cookes ...... Barnsley.
Green, Alfred .... Wakefield.

Equal.
Cross, John .... Northampton.
Matthews, Edward .... London.

Equal.
Brown, Leonard Hackford .... Coningsby.
Cott, Francis .... Liverpool.

Jones, Morgan .... Chipping Sodbury.
Pearson, Charles Frederick .. Liverpool.

Equal.
Shemmonds, Adrian .... Uttoxeter.
Sykes, Joseph Spencer ...... Sheffield.

Equal.
Maynard, George .... Moreton-in-Marsh.
Widdowson, Wm. Lawrence .. Nottingham.

Equal.
Barker, Horsley .... Sheffield.
Holdcroft, George .... London.
Hutchinson, Arthur Ellwood .. Boston.
Morcom, Richard Thomas .... Hawarden.
Smith, Frederic Harcourt .... London.
Williams, William .... Aberffrau.
Williams, William Francis .. London.

Bolt, Richard Tanton .... Tavistock.

Equal.
Dufossé, Henri Erneste ...... Gravesend.
Lawson, Edward James ...... Whitstable.

Spencer, Joseph .... West Bromwich.

Equal.
Emslie, J. Alexander Robson .. Aberdeen.
Fieldhouse, Thomas .... Monmouth.
Keen, Nimrod .... Birmingham.
Warriner, Charles William .. Nottingham.

Goundry, John James .... Barnard Castle.

Equal.
Butler, John Norton .... Leicester.
Jerrett, Edward .... Salisbury.
Mutch, John .... Ellon.
Woodcock, Thomas .... Hinckley.

Equal.
Maitland, Pelham Christopher. Launceston.
Morris, Arthur W. .... Ely.
Oakey, Charles .... Preston.

Equal.
Dale, John .... West Bromwich.
Plimmer, William Thomas .... Uttoxeter.
Walker, John .... Witney.

Equal.
Adams, Frederick .... Gravesend.
Greenwood, Joseph .... Preston.
Harper, Lewis .... Aberdeen.
Hesk, Thompson Charis .... Rotherham.
Pask, Thomas Charles .... Liverpool.
Pearson, John Johnson ...... London.
Pidgeon, Joshua David ...... Brighton.
Wilson, Charles Alfred ...... Twigford.

Equal.
Heath, Frederick Devon ...... High Wycombe.
Hoskins, William .... Poole.
Jones, Henry Denson, jun. .. Sheffield.
Sheppard, Richard Reckerby .. Newark.

The following is a list of Towns in which the Examinations were held, with the number of Candidates annexed.

Aberdeen	6	Hereford	1
Abingdon	1	Hertford	1
Aylesbury	1	Hull	11
Banbury	1	Ipswich	1
Barnstaple	2	Kendal	1
Basingstoke	1	King's Lynn	5
Bath	2	Knaresborough	1
Belper	1	Lanark	1
Birkenhead	1	Lancaster	4
Birmingham	8	Leamington	1
Blackburn	5	Leeds	2
Bolton	1	Lewes	1
Boston	3	Liverpool	6
Bradford	1	London	50
Brighton	4	Louth	1
Bristol	1	Ludlow	1
Cambridge	2	Manchester	14
Canterbury	1	Market Harborough	3
Carmarthen	3	Merthyr Tydfil	3
Carnarvon	1	Monmouth	1
Chatham	1	Neath	1
Chelmsford	1	Newark	3
Cheltenham	1	Newcastle-on-Tyne	2
Chester	1	Northampton	5
Chesterfield	1	Norwich	1
Colchester	1	Nottingham	9
Coventry	2	Oxford	1
Darlington	4	Pembroke Dock	1
Derby	2	Peterborough	1
Dewsbury	1	Plymouth	2
Diss	1	Poole	2
Dorking	1	Portsmouth	1
Dover	1	Preston	8
Droitwich	1	Reading	2
Dumfries	1	Ripon	1
Durham	1	Rochester	2
Exeter	2	Ryde	1
Forres	1	St. Austell	1
Frome	1	St. Ives	2
Gainsborough	1	Salisbury	1
Grantham	1	Sheffield	10
Hartlepool	1	Southampton	1

South Shields	2	Tiverton	1
Southport	7	Wakefield	2
Spalding	1	Walsall	2
Stafford	2	Wareham	1
Stamford	3	Warrington	1
Stoke-on-Trent	3	Wednesbury	3
Stroud	2	Weymouth	1
Sunderland	1	Windsor	1
Swansea	8	Wycombe	1
Tavistock	1	Yarmouth	1
Taunton	2		

Proceedings of Scientific Societies.

SOCIETY OF BIBLICAL ARCHÆOLOGY.

At the Meeting of this Society, on July 4th, 1871, Samuel Birch, Esq., LL.D., F.S.A., etc., in the chair, the Rev. F. K. Cheyne, of Balliol College, Oxford, was duly elected a member of the Society.

Mr. B. T. Lowne, M.R.C.S., F.R.M.S., read a paper on the flora of Palestine. He considered that it comprised eight distinct elements—four, the dominant existing floras of Southern Europe, Russian Asia, North Africa, and that of Arabia and north-western India. Each of these floras were stated to occupy a distinct region of the country. Interspersed with these are found numerous examples of plants belonging to Palearctic Europe, constituting its fifth element. The Arctic flora of Hermon and Lebanon constitutes the sixth. Mr. Lowne thought further, that the cedars of the Lebanon moraines and the papyrus of the Jordan lakes were the remnants of two ancient and almost extinct floras, belonging to two distant geological periods.

Mr. James Collins (Curator of the Pharmaceutical Society's Museum) made some remarks upon the gums, perfumes and resins mentioned in the Bible, particularly pointing out the fact, that few of them were indigenous to Palestine, and that even now very few of them can be accurately identified. In the course of his observations Mr. Collins detailed the characteristic differences between the true and false lignaloe wood, and also made a few remarks on ladanum, myrrh, balm of Gilead, frankincense, etc., particularly adverting to the researches of Dr. Birdwood and others, in identifying the frankincense of the ancients with our olibanum. In concluding, Mr. Collins was requested to treat the subject of the gums of the Bible at still greater length on another occasion.

Mr. Lowne and Mr. Collins brought for exhibition a large number of mounted specimens, and a complete collection of gums, perfumes, etc., to illustrate their respective papers. Messrs. Veitch and Co., of Chelsea, had also sent some pots of Palestine flowers which were, by a most unfortunate accident, returned before the meeting.

Some discussion followed the reading of these papers in which Dr. Birch, J. Bonomi, W. R. A. Boyle, Dr. Cull, W. R. Cooper, J. Collins, S. M. Drach, Dr. Hewlett, B. T. Lowne, G. Smith, and Rev. G. Small took part.

A vote of thanks was heartily accorded to Messrs. Lowne and Collins for their very interesting contributions, and also to Messrs. Veitch for their kind co-operation.

The Society was then adjourned to the first Tuesday in November.

ROYAL BAVARIAN ACADEMY OF SCIENCE.

BARON LIEBIG'S ADDRESS AT THE ANNIVERSARY.

The anniversary of the Royal Bavarian Academy of Science was celebrated at Munich, on March 28th, and was opened by Professor Liebig, as President, with the following address:—

We celebrate to-day the one hundred and twelfth anniversary of our academy. Great historic events have taken place since last year's festival; a new Germany has arisen; the dreams of our youth have become reality, and Germany has ceased to be a mere geographical expression. The English people have nicknamed Germany the Fatherland; but this byeword has now assumed, in their mind, a respectable meaning, giving rise to serious reflection, for it is so unexpectedly great that it cannot yet be quite comprehended. In trying to define the true causes of success of our German armies, we shall discover them to be the very same as those which have shaped our progress in medicine and agriculture.

Eminent physicians and advanced agriculturists have been known at all times, and renowned military leaders in like manner; for centuries the fixed idea has therefore prevailed that in the so-called practical avocations practice and experience were all-sufficient, and that theory was not to be depended upon; and why? simply because true theory was not known.

Practical knowledge and aptness are indispensable in following agriculture, and not less so in medicine; but we are now aware that absolutely certain results depend upon the knowledge of causes and intimate acquaintance with all the active principles by which phenomena are influenced; we know that this knowledge is real theory, and that genuine practice is the art of bringing these principles into play at the proper time and of assisting in their reactions. The old practice, based upon uncertain rules, gave way to scientific practice, which is founded on unalterable truths,—the happy inspirations of a genius who grasped a certain law without being able to account for its causes, are resolved into principles and can be worked out and applied by others. The exclusive property of the genius which constituted his superiority, could, by scientific application, be owned by all.

The foundation of the German empire and the German victories steadily following one another have the closest connection with those military events which, sixty-six years ago, overthrew and shattered into fragments the State of Frederick the Great,—a State antiquated and ossified in red-tapeism. One way only existed to heal the wounds of the State and to impart fresh vigour, and this way Prussia followed to the salvation of Germany; by the foundation of the University at Berlin in 1810, the year of the death of the high-minded Queen Louisa, the road had become visible and had been sketched out; the inexhaustible vigour of the mind succeeded where the limited and worn-out material forces were wanting.

German science was destined to become the source of a new and youthfully fresh political life.

Thus we observe the Prussian people labour perseveringly to acquire that power which science alone can give, and all have witnessed the result to which this long and stern struggle has led. The incidents of a war, such as a siege or a defeat, are owing to causes which may be traced as clearly as those of natural phenomena; and the real secret of the superiority of Prussian strategies consists in the study of military sciences upon the basis of exact methods of natural sciences, and in the thorough investigation of, and acquaintance with, the principles ensuring success or defeat.

Among the branches of instruction at the military academy at Berlin, those natural sciences are most carefully studied which may be utilized for warfare, and the discoveries of the last half-century have been made available for military purposes. And just as the philosopher, in order to solve a problem in exact sciences, must commence with the small, apparently trifling subjects, before he understands and masters the greater one, so we Germans had to pass through a long course of schooling and training, while other so-called eminently practical nations named us dreamers; but it was science which, in 1866 as well as in 1870–71, defeated unsound practice; knowledge that imparted strength and stability to force, and created in our adversaries a fear akin to horror of the German system of spies.

Our colleague Professor von Giesebrecht, in his address as rector of the university, has dwelt upon the part which the German universities had in fostering the national idea of unity among the German races; he showed how the national feeling, long a glowing spark, kept alive in legends, and then roused and reared by German poets, at last ripened at the centres of German science.

We are proud that our king was the first German prince to give expression to the national idea of a German empire, and this deed will remain a brilliant monument for him in history.

It may not be out of place to state publicly, on behalf of our academy, that a hatred of races between the German and Latin nations does not and cannot exist. We look upon the heavy misery which Germany has suffered in former times from the French as upon an illness, the pains of which are soon forgotten on recovery.

The peculiar disposition of the German, his knowledge of languages, his reading of foreign characters, the culture of his mind, render him just to other nations, often to the extreme of being unjust to himself; and thus we do not forget how much we owe the great French philosophers, mathematicians and workers in natural sciences, who have been in many branches our teachers and our prototypes.

Forty years ago, when I went to Paris to study chemistry, accident drew Alexander von Humboldt's attention upon me, and a recommending word of his induced Gay-Lussac, one of the greatest chemists and physicists of his time, to propose to me, a youth of twenty, to continue and to complete, under his assistance, an investigation of mine; he placed me in his private laboratory as pupil and assistant; the whole course of my life was thereby decided.

Never shall I forget the kindness with which Arago, Dulong and Thénard met the German student; and how many of my German compatriots might I name who, like myself, thankfully recollect the active assistance in the pursuit of their scientific studies, given to them by French *savants!* Warm sympathy for everything great and noble, and disinterested hospitality are among the finest traits of the French character; they will revive and become active again on the neutral ground of science on which the best minds of both nations must meet in the pursuit of the high common object, and thus the indissoluble fraternization, on scientific ground, will gradually assist in softening down the bitterness which animates the French national feeling towards Germany, the consequence of a war forced upon us.

Parliamentary and Law Proceedings.

HOUSE OF COMMONS.

Pharmacy Act (1868) Amendment Bill.—*July* 13.—Petitions against this Bill were presented from—

Cambridge, by Mr. W. M. Torrens.

Chatham and Brompton, by Mr. Otway.

July 17.—Petitions against the Bill were presented from—

Hastings and St. Leonard's, by Mr. Brassey.

Wath-on-Dearne, Mexborough, etc., by Mr. H. F. Beaumont.

July 17th, 1871.

The Pharmacy Bill.

Mr. Gladstone in the course of remarks on the business of the House said,—There is the Pharmacy Bill, which is in charge of my Right Honourable friend the Vice-President of the Council, but it cannot be expected to pass without a great deal of discussion, and therefore we think it desirable to withdraw it.

The Bill was afterwards withdrawn.

Child Poisoned with "Soothing Cordial."

On Thursday afternoon, July 13, a child named Mary Wood, aged one year and nine months, residing with its parents on Silkstone Common, died under the following circumstances. It appears that about half-past six on the morning of the above day the deceased took from a chair by its mother's bedside a bottle containing soothing cordial, supplied by an unqualified practitioner at Thurlstone, and drank off a considerable portion of its contents. Some time afterwards, the symptoms which usually follow the taking of narcotic poison began to manifest themselves, and these getting more and more aggravated, Mr. C. O. Rowley, surgeon, was called in soon after midday. He at once pronounced the child to be suffering from the effects of poison. The usual counteracting remedies were adopted, but without effect, death taking place at about half-past four. The facts have been communicated to the coroner, who will hold an inquest.

Poisoning by Oil of Vitriol.

On Tuesday last the child of a puddler, living near West Hartlepool, died from the effects of oil of vitriol administered to it by its mother. Upon his return from work the man was met by his wife, who told him she had poisoned one of the children. A medical man was immediately sent for, who found that the little boy, aged about eight months, had been dead about two hours, evidently from poisoning by oil of vitriol, the tongue being partially consumed, and the lips, throat, and chest dreadfully burnt, as also were his hands, which appeared to have been stretched out to push away the burning draught. It appears that in an outhouse, to which the husband and wife alone had access, the former kept a quantity of chemicals for use in experiments connected with his trade, and that a 2 oz. bottle of oil of vitriol missing therefrom was found in the house by the police, near the bed of the murdered child. The woman replied, on being charged at the police station, that she had done it.

Review.

Companion to the last Edition of the British Pharmacopœia; with Practical Hints on Prescribing. By Peter Squire, F.L.S., Chemist on the establishment of the Queen; Chemist in Ordinary to the Prince of Wales; late President of the Pharmaceutical Society; Member of the British Pharmacopœia Committee. Eighth Edition. London. J. and A. Churchill.

Squire's useful and popular 'Companion' is already well and favourably known to our readers. This edition, the eighth, contains, according to the preface, "the new medicines that have been introduced since the publication of the *seventh* edition, and much additional practical information for the prescriber and dispenser."

The new medicines noticed are:—

Chloroformum aconiti, made with the root of the same strength, and by the same process as the officinal liniment of aconite, recommended for the relief of neuralgia by external application on spongio-piline.

The carbolic acid plaster, of the University College Hospital Pharmacopœia.

Chlor-Alum.

Apomorphia, the discoverers' names not mentioned.

Ferri chloroxydi liquor.

Ferri hypophosphitis syrupus.

Chloral hydrate.

Malate of iron wine.

Mustard leaves.

The additional practical information comprises mainly the strength of the solutions for hypodermic injection of carbolic acid, tincture of aconite, sulphate of atropia, acetate and bimeconate of morphia, corrosive sublimate and chloral: a tabular classification of mineral waters, and an amplification of the index, which will be highly appreciated by busy pharmacists and practitioners of medicine.

From a purely literary point of view, we feel it our duty to condemn the unnecessary amount of puffing scattered broadcast throughout this and all previous editions of an otherwise valuable book. In his preface the author tells us he has "omitted many remarks that are no longer necessary;" may we venture to hope that much of that fulsome praise of his own articles, which disfigures the work, and is unworthy of the Queen's chemist, will be omitted in the next edition, or transferred to its appropriate place, the advertisement pages at the end of the book?

The following extracts on the *new* medicines introduced into this edition, fairly illustrate the excellences and shortcomings of our author's style. The italics are ours:—

"Chloral, Hydrate of.—$C_4HCl_3O_2 + 2Aq$.

"A white opaque mass, having a pungent odour, resembling that of a ripe melon.

"*The author is indebted to his son William Stevens Squire, Ph.D. (who, he believes, is the only maker of this preparation in England), for the following outline of the process:—*

"Pass dry chlorine gas, for several days, through absolute alcohol, sp. g. ·795, until it becomes a thick viscid liquid of sp. g. 1·570.

"At the beginning of the operation, the alcohol is well cooled to prevent inflammation and explosion; but towards the end of the operation the alcohol is heated nearly to the boiling-point. The resulting liquid, which after a day or two solidifies to a mass of crude hydrate of chloral, is agitated well with four times its bulk of concentrated sulphuric acid, and the anhydrous chloral which floats on the surface is separated and purified by fractional distillation. The purified anhydrous chloral is placed in a still, mixed with 11 per cent. of water, and distilled over chalk to remove any hydrochloric acid that may be present, the resulting solid distillate is then fused and poured out into shallow vessels to cast into cakes.

"The action of chlorine on alcohol is very irregular, depending upon the temperature and other circumstances, and the crude product obtained is consequently very variable in composition, requiring some modification of the above process, and frequently special methods of purification. It appears that the purest product is obtained by crystallizing the hydrate of chloral once or twice from purified bisulphide of carbon.

"Solubility: 3 in 1 of water and measures only $2\frac{1}{2}$; in glycerine 1 in 1.

"*Test.*—From 100 grains dissolved in $\frac{1}{2}$ oz. of water and well shaken with 1 oz. of liquor potassæ, after being allowed to stand several hours, at least 46 grain-measures of chloroform will separate.

"*Medicinal Properties.*—An excellent hypnotic, producing sound and placid sleep; suitable for hypochondriacal affections, chorea, nervous disturbances, and restlessness, where opium and Indian hemp disagree. Good also in asthma, whooping cough, scarlet fever, diminishes the temperature of the body, has been found useful in idiopathic tetanus, in doses 30 to 60 grains (*Lancet*, Dec. 31, 1870); also for cancer, 20 to 30 gr. doses (*Lancet*, May 14, and June 4, 1870); 10 grs. three times a day (*Medical Times*, Dec. 31, 1870).

"Dr. Tuke, after trying it on several maniacal patients with good results, reports, "Its advantages over other hypnotics are as follows: that it is more uniform in its action and its effects more lasting, it has no depressing influence, it does not constipate nor produce nausea."

"*Dose.*—From 10 to 60 grs.

"An admirable calming draught is made with 15 grs. hydrate of chloral *and 5 minims of solution of bimeconate of morphia.* Dr. Liebreich employs 7 grains, in solution, for subcutaneous injection.

"Effects from an over-dose or repeated over-doses, are cramp in the legs, swimming in the head, flushed face, closed eyes, with injected conjectiva, and in some cases death."

Chlor-Alum.

"An impure solution of chloride of aluminium, sp. g. 1·150. Contains, in a pint, 1500 grs. of the chloride = 75 grains in the ounce. Introduced as a disinfectant and antiseptic by Professor Gamgee. Should be diluted with four times its volume of water for antiseptic use, but may be used stronger for a gargle.

Liquor Ferri Chloroxydi.

"Intensely blood-red colour, same strength as tinct. ferri perchloridi and liquor ferri perchloridi.

"This preparation was made at the suggestion of Mr. Spencer Wells, who had noticed the paper by M. Jeannel, of Bordeaux, describing a yellow and red peroxide of iron, the latter being soluble in very dilute hydrochloric acid.

"Mr. Spencer Wells has found that he can give this preparation to patients who cannot take the tincture of steel; he has also used it as a styptic at operations."

This is the sum total of the information vouchsafed of one of the *new* preparations, perhaps the *newest.* An addendum of the price per pound is only needed to render the information more readily available to pharmaceutists in general.

As the author has published a substitute for chlorodyne, that those who object to prescribe proprietary medicines may be able to order a compound under the above name, with a knowledge of its composition, we trust some competent pharmacist will do us a similar favour in regard to liquor ferri chloroxydi.

Amongst omissions we note the absence of chloroform water, a pleasant vehicle for a large class of nauseous drugs, and too long overlooked; gaseous and liquid nitrous oxide, extensively used as an anesthetic in dental and some minor surgical operations; syrupy phosphoric acid; the so-called hypochloride of sulphur, and its simple and compound ointment. The formula for the well-known compound syrup of the phosphates, published by Professor Parrish in his 'Practical Pharmacy,' is also omitted.

The practical remarks on most of the preparations are beyond praise. We should like to see this part of the work thoroughly revised with each new edition, and the most recent improvements or suggested improvements added. That this has not been the case hitherto is shown by the comments we find under fluid extract of ergot, where we are still told to use a large quantity of expensive ether, which Umney has shown, as the result of some experiments on the large scale, to be useless, and we believe the editor of the Pharmacopœia holds a similar view. We know as a fact that some manufacturers make it without the ether, and that prescribers do not notice any difference in the activity of the preparation.

Again, under cherry-laurel water, the same chemist, and others before him, have pointed out the variability in the amount of prussic acid present in different commercial specimens, depending upon the time of year when the leaves are gathered, and the *modus operandi* of distillation; surely worthy of notice in connection with the dose, and important also as a caution to prescribers.

Notwithstanding these omissions and the blemishes which we have noticed, this book does contain an immense amount of practical and valuable information, such as could only be written by a master of the craft, and for which every member of the trade ought to be thankful.

We congratulate the author on the completion of the edition, begun and ended after he had passed the age of threescore years and ten: and to every chemist and druggist who wishes to keep pace with the times (and who does not?), we cordially recommend it.

BOOK RECEIVED.

FOURTEENTH REPORT OF THE COMMISSIONERS OF HER MAJESTY'S INLAND REVENUE ON THE INLAND REVENUE for the Years ended 31st March, 1870 and 1871.

Notes and Queries.

*** *In order to facilitate reference, correspondents are requested to mark their answers in each case with the title and number of the query referred to.*

No notice can be taken of anonymous communications. All queries or answers should be accompanied by the name and address of the writer.

[274.]—SYR. VIOLÆ.—Having repeatedly made this syrup according to the several published formulæ, without getting it of that intense blue the wholesale maker does, I shall be glad if some of your correspondents will give a little information on the subject. One maker tells me violet flowers are 8*s*. per lb. Are there two kinds? because I have never known them higher than 4*s*.—H. E. GODFREY, 45, *Curzon Street*.

[275.]—GOLD INK FOR ORNAMENTAL WRITING.—*B. T. A.* will feel obliged for a good formula.

[263.]—DISPENSING PRICES.—There being forty doses, sufficient for fourteen days, the price should be that of a 20-oz. mixture. I had to dispense ½ oz. liquor arsenicalis a few days ago, 3 drops for a dose. I put a poison label upon the bottle, which resulted in my having to explain its meaning to the patient, who requested to "dilute it, as he didn't want a case of accidental poisoning in his house."—H. E. GODFREY.

[*** Our correspondent should be aware that he was not compelled to put on a poison label in dispensing medicine of a poisonous nature. The course adopted might be regarded as a *ruse* to substitute a mixture for drops.—ED. PHARM. JOURN.]

[266.]—SYRUPUS QUINÆ ET MORPHIÆ BROMIDI.—(Dr. B. W. Richardson's):

Bromide of Quinine, 1 grain.
Bromide of Morphia, ⅛ grain.
Simple Syrup, 1 drachm.

ARTHUR WM. POSTANS.

[271.]—DISPENSING.—*A. B. C.* will find by first mixing the yolk of eggs with the water he will get the desired result.—THOMAS W. ROMANS.

[273.]—PODOPHYLLUM PILLS.—In reply to the inquiry of your correspondent *A. P. S.* (No. 273) in yesterday's number of the Journal, I beg to hand the accompanying formula for podophyllum pills, which I have found to answer well:—

℞ Pulv. Myrrhæ ℈ij
Sapo. Castil. ʒiss
Ext. Hyoscyami ℈iiss
Podophyllin Res. gr. xij.

Misce et divide in pilulas xlviij. Each pill contains ¼ gr. podophyllum.—THOS. BREWIS.

A. P. S. asks for a formula. The following is a very common one:—

Resin of Podophyllin, ¼ gr.
Extract of Henbane, 2 grs.

To make one pill. One or two a dose.

ARTHUR WM. POSTANS.

I find the following recipe makes very good podophyllum pills:—

Resin of Podophyllum, ¼ grain.
Comp. Pil. of Rhubarb, 2 grains (ij).
Extract of Henbane, 1 grain.

Mix. Make one pill.—T. P. B.

Your correspondent *A. P. S.* may find either of the following formulæ of use to him.—"A. AND B."

No. 1. ℞ Podophyll. Resin gr. iij
Ext. Hyoscyami,
" Coloc. Comp., ana gr. xxiv.
M. et divid. in pil. xii.

No. 2. ℞ Podophyll. Resin gr. vj
Ferri Sulph. Sicc.,
Ext. Hyoscyami, ana gr. xxiv.
M. et divid. in pil. xij.

CARBOLIC CERATE.—The following formula for this preparation is supplied to the *American Journal of Pharmacy* by Mr. Charles A. Bœhme, of Michigan:—

℞ Adipis ℥x
Ceræ Albæ ℥v
Terebinth. Can. ℥j
Acid. Carbolic. ℥j.

Melt the lard and wax together, add the fir balsam, and, when it begins to cool, stir in the carbolic acid.

The addition of fir balsam to this preparation corrects the disagreeable odour of the acid, and renders it slightly adhesive, which is quite desirable when the compound is used as a dressing for burns, old sores, etc.

SODA MINT.—Mr. Henry A. Borell writes to the *American Journal of Pharmacy* that "Soda Mint," much employed as an antacid and carminative for *over-fed* infants and dyspeptics, was originally a favourite prescription of Dr. George Norris, of Philadelphia. His formula was the following:—

℞ Sodæ Bicarb. ℥ss
Spt. Ammon. Aromat. ʒj
Aquæ Menthæ Piperitæ Oj.

M. Dose, from a dessertspoonful or a tablespoonful for adults; from half to one teaspoonful for infants.

TREATMENT OF POISONING BY CARBOLIC ACID.—Mr. Charles Roberts, in a recent communication to the *British Medical Journal*, expresses the opinion that the administration of a mixture of olive oil and castor oil, which has been recommended in cases of poisoning by carbolic acid, with the object of diluting and carrying off the acid by the bowels, is of doubtful benefit, as it causes the acid to pass over the fat-absorbing surfaces of the small intestines. He considers it probable that, as carbolic acid is little soluble in water, the speediest and most effectual way of removing it mechanically from the stomach would be to administer large quantities of warm water or mustard and water. As it is very soluble in glycerine, that substance, with water and sulphate of zinc, might be employed after the bulk of the poison has been removed by the former plan. As to the chemical neutralization of the acid, its affinity for albuminous compounds would point to eggs and finely-powdered raw meat as likely to be of service. If eggs were used, they should be very much diluted by being whipped up with milk or cold water. Milk is not coagulated by carbolic acid, and therefore would not act as a neutralizer, but it would be a more suitable application than oil to the injured mucous membrane.

The following journals have been received:—The 'British Medical Journal,' July 15; the 'Medical Times and Gazette,' July 15; the 'Lancet,' July 15; the 'Medical Press and Circular,' July 19; 'Nature,' July 12; the 'Chemical News,' July 15; 'Gardeners' Chronicle,' July 15; the 'Journal of the Society of Arts,' July 15; the 'Grocer,' July 15; 'Produce Markets Review,' July 15; the 'English Mechanic,' July 14; the 'American Journal of Pharmacy' for July; the 'New York Druggists' Circular' for July.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Metropolitan Chemists' Defence Association.

"The Bill intituled an Act to amend the Pharmacy Act, 1868," is now numbered with the things of the past, and for a considerable time will probably cease to cause excitement and contention in the pharmaceutical world; but as is often the case, warfare makes friends and cements into closer union those who have hitherto known one another by repute alone, so has the battle just fought, in resisting the attempts ruthlessly to fetter the members of our trade, been eminently conducive to the same happy result.

That "union is strength" has again been amply exemplified, and whatever may be the taunts and sneers of our opponents, "that the Bill has been massacred in company with many other innocents, and is only deferred for a more stringent and objectionable form of legislation on a future day," the fact remains beyond dispute—and facts are stubborn things—that, thanks to the efforts of our own and kindred associations, the Government has been compelled, in the first place, so materially to alter the Bill as virtually to constitute it a new Bill, which the House refused to read, even *pro formâ*, without time being given for reconsideration, and subsequently, through our continued resistance to its imposition, entirely to abandon.

"Sufficient to the day is the evil thereof;" a danger met us in our usually quiet course of life, it was faced manfully and has been defeated effectually. What has been done may yet be done again, and instead of fainting at the prospects of a phantom, we will look back with thankfulness and forward with courage and confidence; not desiring to *court* fresh encounters, but prepared, should the emergency arise, to meet it with the same determination as heretofore.

Congratulating our friends upon the result of their co-operation and support,

I am, Sir, faithfully yours,

Edwin B. Vizer.

63, Lupus Street, Belgravia South,
July 18th, 1871.

The Pharmacy Bill.

Sir,—Although the Pharmacy Bill was withdrawn, with many others, on Monday night, from the present session, because, as Mr. Gladstone remarked, it could not be passed without discussion, I think it right to send the accompanying letter,* which was posted to members of Parliament on Saturday last, in order that you may insert it in the next issue of the Journal. Several gentlemen whose names did not appear on the list sent me their approval, but too late to be recorded when the letter was sent out.

47, Piccadilly, London, George W. Sandford.
July 19th, 1871.

Sir,—Mr. Gladstone stated in the House of Commons on Monday last that the Pharmacy Bill was withdrawn. For the present year, therefore, the danger of being placed under any compulsory regulation is averted. It will be well for every member of the Society carefully and dispassionately to weigh over the events of the past few weeks.

It has been asserted that when the Pharmacy Act, 1868, was passing through the House of Commons, "a tacit understanding" was come to between Dr. Simon and Mr. Sandford that he (Mr. S.) would require all the registered pharmaceutical chemists and chemists and druggists to conform to certain compulsory regulations for the storing of poisons.

If such was the case, and certainly the course of action taken by Mr. Sandford, and so zealously pursued, seems to verify the statement, it must be apparent that Dr. Simon, as the medical officer of the Privy Council, asked of Mr. Sandford a promise, the nature and magnitude of which had evidently not struck the learned Doctor, and when Mr. Sandford assented to the promise it was apparently without due thought and consideration.

If this is a correct interpretation of the facts, it is obvious, in endeavouring to persuade the Society to carry out his promise, Mr. Sandford has only been actuated by honourable motives. The number of petitions presented to the House of Commons against the Bill must have satisfied Mr. Sandford that he has misinterpreted the feeling of the trade, and having that fact forced upon him, we can hardly suppose that he will revive the question at any future time.

The far-seeing policy of the Executive Committee of the Defence Association, through whose untiring energy, perseverance and management the withdrawal of the Bill is in a great measure due, cannot be too highly commended, and if next year it is necessary to defend our rights, I hope the same zealous committee will have charge of our interests.

Edwin Yewdall.

Sir,—For the present the attempted tyrannical interference with our business has been defeated. It is not to be supposed, however, that the question is settled. This is only one amongst many other attempts of the same character for the last forty years, and the strong (unprovoked) hostility which a small section of the medical profession entertain towards us is seen in one or two of their journals. This unhappy feeling can only be traced to that desire too commonly manifested,—the natural desire of one man to tyrannize over and oppress another. Once let the chemists submit to this kind of interference, and they will have to submit to it to the bitter end, and will probably be glad to throw up their pharmaceutical privileges altogether. It is not, however, to be supposed that the medical profession generally entertain these sentiments towards us. We know that thousands of them do not; and now that the Privy Council and the Government have seen that we shall not quietly submit to be blotted out of the political world, it is not unlikely they may be more disposed to deal with us as with any other class of men deserving of some reasonable consideration in the land, and that a timely effort on the part of the new Council may succeed in some satisfactory arrangement being effected. Our greatest danger is from those amongst ourselves who seem to invite control and interference from without, and those juniors in the trade who have stepped a little too far out of their position to dictate to the whole body of chemists.

Oxton, July 19th, 1871. Joseph Ball.

Seeing *versus* Feeling and Hearing.

Sir,—An ingenious correspondent in last week's Journal suggested the attachment of a bell to all bottles containing active poisons; may I be allowed to further suggest that instead of one bell, there be connected with the bottle several bells, to ring muffled peals during the time a bottle is being used by the dispenser? Another excellent plan for attracting the dispenser's attention to the deadly nature of the preparations he is handling, would be to have musical boxes connected with the bottles, so that upon removal of a stopper the box would tinkle out the 'Dead March in Saul' in all its awful solemnity. If this plan failed to collect a dispenser's wandering thoughts, I am sure no other would succeed. Putting aside all joking on so important a subject, however, is it not humiliating that we should each week publicly admit an inability to dispense correctly, without being surrounded with such extraordinary safeguards (?) as sandpaper-covered bottles, ingeniously locked stoppers, bottles of inartistic shape, covered with spikes of glass, or with balls attached to them, and dozens of other such childlike toys? Are our eyes less trustworthy than formerly, that we are compelled to substitute the sense of feeling for that of seeing? Of what use is our pharmaceutical training if we require the aid of machinery to remind us which are poisonous and which harmless drugs?

But, although I hold all these fanciful inventions in abhorrence, I am an advocate for arrangement and precaution. By all means separate the poisons from the less dangerous drugs, and place them in a cupboard by themselves. Avoid having two preparations similar in appearance side by side, and carefully extra-label the stronger tinctures, such as hyoscyamus, conium, digitalis, etc., with such labels as those published by Mr. Silverlock, printed on red paper.

In conclusion, may I express a hope that the literary

* See p. 67.

attainments of your numerous correspondents on the poison question will soon be turned to account in the publication of interesting facts respecting experimental and practical pharmacy? A perusal of the pages of the PHARMACEUTICAL JOURNAL for the last twelve months leads me to the opinion, that for most matters of interest in connection with our trade we are indebted to American sources.

Leominster, July 18th, 1871. M. J. ELLWOOD.

POISON BOTTLES.

Sir,—We have been endeavouring to improvise a 'poison' bottle, instead of asking a practical bottle-maker to construct one for us.

Maw's guards or Baildon's india-rubber caps, though distinctive enough, have this great disadvantage, they require both hands of the dispenser, not only for their removal, but also for their readjustment. When one is busy, or on a market-day when customers are eager to catch a train, one cannot take time to refasten those safeguards. Such mechanical difficulties put in the way of the dispenser require more time than he can well afford.

The great desideratum is some simple contrivance which would permit us to measure liquor arsenicalis with as much facility as liquor bismuthi. I have long been of the opinion that an effective poison bottle could be made on the bayonet-catch or some such principle, to be locked or unlocked by giving the stopper half a turn, and this could be performed without bringing either bottle or measure to the counter.

The difficulties in the construction of such a bottle might easily be overcome by a practical bottle-maker. These bottles would, of course require to be longer in the neck than those in ordinary use, as the ground portion of both stopper and bottle would be lower than the catch. The projections on the stopper would correspond with the notches in neck of bottle, and these be so arranged that the stopper (on its insertion) could not go "home" till it was locked by giving the half turn. Some such contrivance would throw a mechanical obstacle in the way of an absent-minded or careless dispenser, and be equally adapted for narrow-mouthed or wide-mouthed bottles. SCOTUS.

Sir,—The safety-guard for bottles containing poison, suggested by your correspondent Mr. J. R. Summers, is very similar to the one I exhibited at the Liverpool Conference; but as mine possesses one peculiarity, which in practice would be found of importance, perhaps you will allow me space for a brief description. If there is simply an india-rubber band across the stopper, when once slipped off, it will be found difficult to be laid hold of again to replace in position; for this purpose a projecting knob is required to rest on the top of the stopper, which may be made in the following manner:—Take a $\frac{3}{4}$-inch brass paper fastener and bend back the two prongs in the form of hooks, on which must be hung the sides of an india-rubber ring, about an inch diameter; the hooks are then to be pressed together and the two loops tied round the neck of the bottle; or a second ring, about $\frac{1}{2}$-inch diameter, may be tied to the loops and passed over the neck of the bottle. I have had them in use for a long time, and am quite satisfied with their convenience and efficiency.

For the purpose of further distinguishing at a glance the articles belonging to the two parts of the "poison schedule," I make use of a red and also a green circular label, on which is a black cross, with the words "poison schedule," part one or part two, as the case may be; the colour indicating at once whether the article requires registration or a poison label only.

Liverpool, July 13th, 1871. GEORGE BARBER.

OVERDOSES.

Sir,—By a very simple arrangement, overdoses in prescriptions might easily be detected.

I would suggest that chemists should have written on every bottle the full B.P. dose of the drug contained therein. For instance, after the name extractum ergotæ liquidum should be written 30 minims; after hydrargyri perchloridum gr. $\frac{1}{8}$, and so on. By this means it would be impossible for an overdose to go unobserved, and in many instances time would be saved as the dispenser would not have to refer to the Pharmacopœia when doubtful of the dose. Of course, all preparations "not official" should be treated in the same way, as many of them being seldom used the dose would not be so familiar.

L. T. ASHWELL.

LEMON AND LIME JUICE.

Sir,—I think your remarks on my letter are hardly to the point, as they do not satisfactorily meet the question at issue. My communication was in reply to your paper asking for a substitute for lemon- and lime-juice, and I there stated what I had done, as also the reason which induced me to try the citrate of potash.

As far as my opinions on the matter are concerned perhaps some of them are not correct, and I am quite willing to withdraw my charge against lemon-juice and rum, which, perhaps, may be thought by some persons to be a very nice mixture, and taken with pleasure by sailors for the sake of the rum it contains; but still this does not at all settle the question as to the value of citrate of potash.

My reason for stating that citric acid was useless was due to the fact that the acid is not used as a substitute for lemon-juice, and also that various fruits and fresh vegetables are equally useful as lemon-juice, although none of them may contain citric acid. The same may also be said of fresh meat. The question then really seems to be, whether the value of these various bodies, as I stated in my letter, may not be due to the potash they contain in combination with an organic acid, either citric, tartaric, malic, etc., as the case may be.

I cannot see that any amount of laboratory work will settle the question; and after all it can only be solved by careful experiments at sea during a lengthened voyage. As far as I am able, I have attempted to find an answer to your query, and, as I stated in my former letter, must now leave it to others to determine by careful experiments whether the remedy I propose has any value or not.

ROBERT PALMER.

"*Chemicus.*"—It is supposed to facilitate the oxidation of the iron, and so increase the amount dissolved. Many excellent operators, however, do not find any advantage in this process over the old one of complete immersion.

R. S.—A certain amount of basic chloride is formed during fusion. This is decomposed by water into oxide and soluble chloride.

A. P. S.—You will find a formula for Composition Powder in the first volume of this series, p. 457, and for podophyllum pills in the present number.

"*Roy.*"—1. Mayne's 'Medical Vocabulary' (Churchills).—2. Piesse's 'Art of Perfumery' (Longmans).

C. D. C.—Perhaps the occurrence was owing to an accidental scratch, or the glass may have been imperfectly annealed. We cannot account for it in any other way.

"*Alumen.*"—See a paper on the "Detection of Alum in Bread," read before the Glasgow Chemists and Druggists' Association by Dr. Carter Moffat, Vol. I. p. 595.

R. G. Mumbray.—We suppose that there must have been some informality in the petition against the Pharmacy Act Amendment Bill, which you inform us was presented by Mr. Peek on behalf of the inhabitants of Richmond on Monday last, since its presentation is not recorded in the votes and proceedings of the House of Commons.

G. B. Cocking.—The letter sent for insertion in last week's issue reached us about six hours after the Journal had been printed.

S. W. N.—Tarragon vinegar is made by digesting the fresh plant in vinegar or dilute acetic acid. We are not aware of any substitute for the plant.

W. H. B.—Mix the powder with sufficient sulphuric acid to convert two-thirds of the lime into sulphate.

E. J. Beal.—We decline to advertise the practice referred to in your letter; and though we regret that any member of the Pharmaceutical Society should lend himself to such a proceeding, we can at present only hope that the business of a pharmacist will ultimately be regarded in such a light by all those engaged in it as to prevent the adoption of such a course by any one belonging to the trade.

"*Beta.*"—We regard the case referred to in your letter as one of the sale of an article of drysaltery, and we think it should not be regarded as competition with qualified pharmacists.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. A. Deck, Mr. T. H. Hustwick, Mr. R. Bannister, Mr. J. Inglis, Mr. F. Crace Calvert, "Alumen," "Aqua Destillata."

THE STRENGTH OF THE HYDROCYANIC ACID OF PHARMACY.

BY DR. W. A. TILDEN.

Having on several occasions noticed considerable deficiencies in the strength of hydrocyanic acid said to be B.P., that is represented as containing 2 per cent. of real acid, I have recently examined a few samples, with the view of comparing them together, and of ascertaining how far they diverge from the Pharmacopœial standard.

A weighed quantity was in every case introduced into a stoppered bottle containing water, and more than sufficient potash to convert all the HCN into KCN. An accurately standardized solution of nitrate of silver was then run in from a burette, till, after shaking, the last drop produced a faint opacity of the fluid. As in most cases two experiments were performed with the same sample, the close agreement of the results shows the accuracy of the method.

No.	Percentage of HCN.	
1	2·183	2·188
2	2·037	2·028
3	1·909	
4	1·521	1·526
5	·980	
6	·903	·904
7	·789	·796
8	·483	·484

The first three are what they should be; the fourth is only three-quarters of the strength required officially; the last four are quite unfit to use, and should be condemned. Pharmacists who employ for dispensing purposes hydrocyanic acid in such a condition as these four samples should not forget that they take upon themselves the responsibility of reducing the dose ordered by a medical man in his prescription to one-half, or as in the last case to less than one-fourth.

It is difficult to suggest a remedy for this kind of thing. The practice of testing all the more important preparations, both qualitatively and quantitatively, must become more common than hitherto among retail druggists; and in the case of articles like prussic acid, which is cheap, easily prepared, and in the dispensing of which accuracy is specially demanded, it seems desirable to renew the stock often enough to avoid changes of such a serious character.

THE OPTICAL ANALYSIS OF BEES-WAX.

BY HENRY POCKLINGTON, HULL.

A brief *résumé* of my observations and experiments in the optical analysis of *Cera flava* and *C. alba*, as found in the trade, may not perhaps be uninteresting or wholly valueless. It has been remarked to me that pure wax is not to be obtained in large quantities, and that wholesale dealers feel themselves secure against detection, provided they restrict their choice of adulterants within certain limits. To some considerable extent this is true; to so great an extent, indeed, that out of the very numerous samples that I have examined, all said to be "pure," there was not one but was more or less largely adulterated; and I have knowledge of firms who professed themselves able to supply any quantity of pure wax; but, being told that it would be submitted to a competent analysis, wrote, stating their regrets that they had no "pure" at present in stock.

During a conversation on microscopical subjects with my friend Mr. C. P. Gibson, M.P.S., of this town, this beeswax question cropped out, and my friend, himself an ardent microscopist, produced a number of slides of *Cera flava* and *C. alba* for my inspection, remarking, "they are all said to be pure, but one, at least, is very remarkable as regards the form of the crystals." A cursory glance convinced me that one specimen was very adulterated, and none of them, least of all the *C. alba*, appeared to me to be genuine. To obtain a sample of pure wax was now our difficulty, from which Mr. Gibson's assistant speedily extricated us, by obtaining from some friends who were beekeepers a small portion of absolutely unadulterated wax that had been prepared by them for their own use. My friend most kindly undertook to prepare for me, according to my directions, a series of slides, some being pure, others adulterated in defined proportions with suet, lard and stearine, the whole being put up in a similar manner, and carefully labelled. A slight examination of these slides by means of the microscope would show the least experienced observer that a slide of pure wax was a far less pretty microscopic object than a slide prepared from ordinary commercial wax. But this is hardly enough. More is required than a slight difference in prettiness to enable us to pronounce decidedly upon the presence or not of an adulterant. For example, it might be objected that the two slides were prepared from wax of a different nationality, and that the very different food of the bees in the one country caused a variation in the beeswax, which was shown by the slightly different arrangement of the crystals as seen under the micropolariscope. To satisfy myself that this was not a misleading element in the affair, I examined a considerable number of samples of commercially pure wax under a Beck's ¼-inch objective, using a Nichol prism for polarizer, and an exceedingly good tourmaline as an analyser. Under the ¼-inch, the form of the crystals in commercial wax, as in pure, are seen to maintain a strong individuality. The wax crystal is smaller, always less feathery in aggregation, and has slightly different (as yet undetermined) rotative powers. The wax crystals in an adulterated or commercial specimen can almost be pointed out one by one to an observer by means of an indicating eyepiece. Their separation is most complete and distinct. It is not easy, without carefully-executed drawings, to point out the difference between the forms of wax crystals and those of the stearine (in some form or other) with which wax is invariably adulterated. It may serve my purpose here, which is merely to suggest a means by which every chemist may act as his own detective in this matter, if I describe my mode of procedure.

The only requisites are a microscope of tolerably good workmanship, such as may be purchased of any of our leading opticians for a few pounds. The stage should either be itself capable of rotation or receive Swift's Blankley's* revolving stage, an ex-

* It is due to these gentlemen that I express my thanks for the courtesy with which they have placed apparatus at my disposal in working out certain microscopic problems, and in carrying out my suggestions.

ceedingly inexpensive but valuable adjunct to the polariscopist. The polarizer should be a good Nichol prism, the analyser, which *must* be capable of being rotated, may be either a tourmaline, Herapathite, or Nichol. Mr. Swift fits the Nichol prism in a manner singularly well adapted to polariscope researches, and, when specially requested, provides means by which the precise number of degrees over which the analyser is rotated may be measured without the necessity of carrying the prism in place of the cap over the eyepiece. A few glass slides, then covers and thick brass plate, are the remaining requisites. The first step should be to prepare a slide or two of known pure wax. Having cleaned the slip and cover perfectly, place the former on the brass plate (which should be at least half an inch thick), with the cover upon it as near the centre as possible. Place at the edge of the cover a small fragment of wax and slowly heat the plate by means of a spirit-lamp underneath until the wax melts. Extinguish the lamp, and allow the whole to cool. When the slide is cold remove it. Prepare slides of *commercial* stearine, of composite candle fat, suet and spermaceti in the same way, and label each as prepared. Mix with the pure wax various proportions of stearine, tallow, suet; mount slides and label. Finally, study each carefully under the micropolariscope, the prisms being crossed so that the field is dark, and rotate the slide by means of the rotating stage. When thoroughly familiar with the differences between these slides and the forms of the several crystals, the observer may proceed to the examination of commercial wax, and he will be singularly fortunate (according to my experience) if he discover a single *pure* specimen of commercial wax. *Cera alba* is, to my notion, the most adulterated, chiefly, I think—though, from my comparative neglect of this article I am not sure—with stearine. Spermaceti is also probably adulterated, but as yet I have not obtained a trustworthy standard specimen.

THE ECONOMIC USES OF MALVACEÆ.

BY ERNEST T. AGNEW.

The astonishing neglect of the valuable properties of this important Natural Order in British pharmacology is somewhat extraordinary, considering the extent to which our immediate neighbours employ them. No one species of the Order, with the exception of *Gossypium*, appears in our Pharmacopœia; whereas the French Codex enumerates five species, and twelve preparations therefrom, not including the celebrated "Pâte de Guimauve," which, curiously enough, contains nothing to identify it with its name, but is made as follows:—

White Gum . . .	1000	grammes.
White Sugar . .	1000	,,
Water	1000	,,
Orange-flower Water	100	,,
White of Egg . .	No. 12.	

Great care is necessary for a successful issue. The solution of gum and sugar should be evaporated over a water-bath to the consistence of thick honey, and the white of eggs, previously well whisked with the orange-flower water, should be added gradually, and the mixture constantly stirred till nearly solid. The result repays the trouble incurred, the fresh pâte being an universally-liked and deservedly-favourite remedy for irritation in the throat, larynx or fauces.

The common *Malva sylvestris*, so abundant everywhere in England, furnishes nearly as much mucilage as the *Althæa officinalis*, and furnishes a conspicuous example of credulous natures "going farther and faring worse." Flowers, leaves and roots all abound with it. The celebrated oculist, Dr. Desmarres, frequently prescribes a hot decoction of the root with which to bathe the eyes in any case of inflammation of those organs. A "*tisane*," or infusion of the flowers sweetened with sugar, is used on the Continent in lieu of linseed tea,—its agreeable flavour and greater efficacy particularly recommending it as a demulcent drink in fever, cold or gonorrhœa.

The *Lavatera arborea*, or Sea Tree-mallow, is frequently employed by the inhabitants of the coasts on which it grows. Its large deep-purple flowers covering the shrub, which always grows on small rocky islets, render it one of the handsomest of our indigenous plants. All parts of it are equally mucilaginous, and the petals yield a splendid colour when infused with hot water. The flowers of the *Althæa arborea seu rosea*, the Hollyhock of our gardens, are much used in Germany. They contain a red extractive and mucilage.

The *Althæa officinalis* ranks high in the estimation of most Continental practitioners. The powdered root is used chiefly as an excipient,—much, in fact, as liquorice root is used here,—and has the advantage of being white and nearly tasteless. A cataplasm of it is also officinal. The syrup is an agreeable vehicle for kermes, morphia and other active medicines. Guimauve lozenges are prepared with a mucilage of the plant, and dissolve in the mouth with a peculiarly balsamic and slimy effect. *Malva glabra*, *rotundifolia* and *sylvestris* are also officinal. Their flowers are used for *tisanes* or infusions, and are a component of the famous *quatre-fleurs* (*species emollientes*).

The Cotton-plant (*Gossypium*) is too well known to pharmacists to need any description. The oil is largely imported, being expressed from the seeds by means of heat. Its chief use, I am sorry to add, is to adulterate other more expensive oils.

The boiled root of the *Althæa*, after preparing the decoction, is highly palatable, and can be eaten with much relish as a vegetable. During a short historic period, in which hunger caused many of us to make some curious experiments with the esculent commodities of a pharmacy, we found the boiled marshmallow-root a very pleasant addition to horseflesh, much resembling salsify in flavour and appearance. How much esculent food is lost in this country through ignorance and prejudice is an economist's problem; but I am certain that boiled chickweed is superior to spinach, dandelion salad to endive, and marshmallow-root to parsnips. *Crede experto.* The hedges furnish food for thousands, but is science powerful enough to overcome prejudice?

PHARMACY IN PORTUGAL.

Dr. Ullersperger, of Munich, gives an account of the state of pharmacy in Portugal in 1869–70, which he divides into two parts, viz. the pharmaceutical instruction at the University of Coimbra, and the position of practical pharmacy. At the university five years' study are prescribed, viz. 1st year, inorganic chemistry; 2nd year, organic chemistry and analysis; 3rd year, natural philosophy (1st part) and botany; 4th year, natural philosophy (2nd part) and zoology; 5th year, mineralogy, geology, and mining. For practical instruction the university possesses museums for zoology, mineralogy, conchology, and for physics; also a chemical laboratory, and a splendid botanical garden, which may rival with any other in Europe. The last was founded in 1773, and is now under the direction of Dr. A. J. R. Vidal; the gardener is a native of Schleswig-Holstein, Mr. E. Goetze, who was recently sent to the Azores, whence he brought home many exotic plants.

There is also a museum for medical chemistry, which is open for pharmaceutical students, containing in two large rooms collections of apparatus and preparations. The dispensary attached to the university serves for practical instruction; it contains rooms for dispensing, the hospitals in connection with the university being supplied with medicines from here, store rooms and a large lecture-room. Dr. A. de Vascoricellas, the director, lectures here on pharmacy and materia medica for medical students; the pharmaceutical course in the laboratory lasts two years, while the third and fourth years are reserved for practice in the dispensary.

The want of a pharmacopœia in Portugal has been felt for a long time; true there was a Pharmacopea Regal published by Tavaxes in the last century, but it did not keep pace with the progress in science; it was followed by a Codigo Pharmaceutico, by Dr. A. Albano da Silveira Pintro, and in 1838 a commission was appointed to draw up a codex for medical men and pharmacists. The result of their labour was the Pharmacopœa Lusitana, but the one now in force is nothing more than a revised edition of Dr. Albano's Codex. The Sociedade Pharmaceutica hold their meetings at Lisbon; one of the leading members is Henrique José de Sousa Telles. There are several pharmaceutical journals in Portugal, the most important of which at home is the *Revista de Pharmacia e Sciencias Accessorias do Porto*, while the *Archivo de Pharmacia e Sciencias Accessorias da India Portugueza, publicado e redigido por Antonio Gomes Roberto*, professor of pharmacy at the medical school at Nova Goa, Portuguese India, represents the interests of the Transatlantic possessions; it appears in monthly numbers, and it may be interesting to give the contents of a recent number, as showing the position of the profession in the far away countries; they are, analysis of a mineral from the province Canacorea by Cabo de Rama, merely showing clay and iron pyrites; a paper on the climate of the island of Mozambique, by Dr. C. A. de Macedo e Valle; several formulas, such as syr. tolutanus, syr. sarsaparillæ, syr. rhataniæ, inf. aur. co. aquosum, liq. spir. tolutan., and letters on the medico-chirurgical school and on experimental physiology, and finally, a report on insalubrity by Sr. Bartholomew do Choras, and on stagnation of saline waters in Vargea Cadlem do Bairo Paudi Vaddo, by Dr. F. M. da Silva Torres.

As a special branch of science, pharmacy in Portugal is far behind England, Germany or France, and a wide field for investigation is still open, especially in two directions, viz. in organic chemistry, physiological as well as pathological, and in analyses of mineral waters, in which the country is particularly rich.

FLUID EXTRACTS AND THEIR MENSTRUA.

BY EDWARD R. SQUIBB, M.D.

(*Concluded from page* 65.)

FLUID EXTRACT OF CONIUM SEED, NOT OFFICINAL.

But should be. One hundred pounds of green unripe fruit or seed, yield about thirty-five pounds of dried unripe fruit, which when properly dried retain their green colour. The best fluid extract of this very tender and sensitive drug, is made by crushing the fresh unripe seed with a small proportion of stronger alcohol slightly acidulated with hydrochloric acid, and pressing out the liquid by a powerful press, and evaporating, without heat, by enclosing it over lime, until three pounds of the fresh unripe fruit is represented by one pint of the preparation.

An excellent preparation may also be made from the dried unripe fruit in fine powder, by repercolation with stronger alcohol slightly acidulated with hydrochloric acid.

FLUID EXTRACT OF ERGOT, OFFICINAL.

Ergot cannot be obtained in fine powder without material injury. It should be had in as fine a powder as practicable without drying, and this grinding should be done at the time when it is to be percolated. Skilfully repercolated with diluted alcohol acidulated with one per cent. of acetic acid, the preparation appears unexceptionable. A pint of the menstruum, at 25° C. = 77° F., weighs about 6824 grains, and a pint of the finished preparation weighs about 7224 grains, giving a difference of about 400 grains.

FLUID EXTRACT OF IPECACUANHA, OFFICINAL.

This preparation is very much in need of special study and research, the present formula being troublesome and uncertain in regard to the precipitation of the resin, and yielding a preparation not uniform in appearance and properties.

FLUID EXTRACT OF PAREIRA BRAVA, NOT OFFICINAL.

But should be. This drug from its density is a refractory substance to percolate. It should be in the finest possible powder, and be percolated very slowly with the mixture of alcohol, glycerine and water.

FLUID EXTRACT OF WILD CHERRY BARK, OFFICINAL.

This is, perhaps, the most troublesome of the officinal formulas, and requires more knowledge and skill than repercolation does. If the menstruum be watery enough, and contain but little alcohol, the reaction between the constituents of the bark for the production of hydrocyanic acid and oil of bitter almonds takes place during the maceration, and thus saves the circuitous route by emulsion of almonds. The mixture of alcohol, glycerine and water is well adapted to this percolation, and yields a preparation having much more of the sensible properties of the drug than the officinal process. It should also be made double the present officinal strength.

A pint of the menstruum weighs about 7540 grains at mean temperatures, and a pint of the preparation of full strength about 8290 grains, giving a difference of about 750 grains. Or, for the present officinal half strength, the weight of a pint would be about 7915 grains, with a difference of about 375 grains.

The hydrocyanic acid and oil of bitter almonds of this preparation seem to suffer spontaneous decomposition, as the proportion, always very small, appears to diminish somewhat rapidly. As the physician often needs these sedative constituents, they should be added at the time of prescribing.

FLUID EXTRACT OF RHUBARB, OFFICINAL.

The rhubarb should be in very fine powder, and be repercolated with the mixture of one part glycerine and three parts stronger alcohol. Many menstrua were tried with this drug, but none seemed to do as well as that indicated. A pint of the menstruum weighs about 6828 grains, and a pint of the finished preparation about 7328 grains, giving a difference of about 500 grains.

FLUID EXTRACT OF SARSAPARILLA, AND COMPOUND FLUID EXTRACT OF SARSAPARILLA, BOTH OFFICINAL.

Should be in fine powder, and be repercolated with diluted alcohol, and glycerine added to the weak residuary percolate in such amount as to constitute one-fourth the weight of the finished preparation. This should then be reduced to the proper extent by distillation, and the glycerine residue be added to the strong percolate.

The mezereon of the compound fluid extract is often complained of, and probably might be omitted without injury.

FLUID EXTRACT OF SENNA, OFFICINAL.

This preparation, made by the officinal process, is often complained of for want of purgative strength. In order to try the effect of stronger alcohol as a menstruum for senna, a portion was completely exhausted by the use of 18 pints of the alcohol. The residue was dried, and when taken by the writer in doses of 180 to 200 grains, proved purgative, and produced griping. Other portions were exhausted by weaker alcohol, and the residue tried in the same way, but the purgative power did not disappear entirely until the alcohol was reduced by the addition of half its volume of water. It appears, therefore, that the officinal diluted alcohol, as now used, or that which is a little stronger, as made by mixing equal weights of stronger alcohol and water, are one or the other proper for the repercolation of senna. The diluted alcohol has been tried and does well, but whether the other would be better has not been tried. The addition of glycerine, even in small proportion, overloads the preparation with mucilaginous extractive matter.

FLUID EXTRACT OF DANDELION, OFFICINAL.

The German bitter root is much preferred by the writer, and it should be in very fine powder. The officinal diluted alcohol, as now directed, dissolves an unnecessary proportion of the mucilaginous ingredients of the drug, and clogs the percolations. A mixture of equal weights of stronger alcohol and water answers better, and yields a good preparation.

FLUID EXTRACT OF UVA URSI, OFFICINAL.

Should be simply repercolated in very fine powder by the mixture of alcohol, glycerine and water. This menstruum seems well adapted to this drug.

FLUID EXTRACT OF VALERIAN, OFFICINAL.

Various mixtures of glycerine were tried for percolating this drug, but without success, nothing answering so well as stronger alcohol. English valerian yields a preparation of milder taste, and finer and more delicate odour. But the German or French drug, which gives a peppery impression to the tongue, is doubtless the more effective medicinal agent.

FLUID EXTRACT OF AMERICAN HELLEBORE, OFFICINAL.

This should be repercolated in very fine powder with stronger alcohol, and should always bear a red label.

FLUID EXTRACT OF GINGER, OFFICINAL.

This should be made from African ginger in very fine powder, and not from Jamaica ginger. The latter has a finer aromatic flavour, but the former is the stronger carminative. The menstruum should be stronger alcohol.

The difficulty and labour in making good fluid extracts has recently led to a proposition, chiefly advocated among the pharmacists of Chicago, to reduce the strength of these preparations by one-half, or to the present strength of the fluid extracts of cinchona and wild cherry bark. Although there are some good reasons for this proposition, yet in the writer's opinion it would not be a wise change. The popularity of these medicines, as a class, depends largely upon the convenience which they offer to country physicians of carrying their remedies in a small compass, and in a convenient form; and to give this and many other advantages up at this late day, after many of the difficulties and deficiencies have been discovered and remedied, would be to sacrifice much useful labour with the recognized advantages. Besides, one of the most useful of the directions in which progress in pharmacy is recognized, is in the concentration and condensation of medicinal agents.

One direction in which several of the fluid extracts might be improved, is by the addition of corrigents. Fluid extracts of cinchona and senna should have aromatics in full proportion added, and there should be a fluid extract of May-apple with belladonna or hyoscyamus, and aromatics.—*Proc. Amer. Pharm. Assoc.*

THE ACTION OF HYDROBROMIC ACID ON CODEIA AND ITS DERIVATIVES.*

BY C. R. A. WRIGHT, D.SC.,

Lecturer on Chemistry in St. Mary's Hospital Medical School.

It has been shown in Part I. of this research† that the action of hydrobromic acid on codeia gives rise, without evolution of methyl bromide, first to bromocodide, and secondly to two other new bases, termed respectively deoxycodeia and bromotetracodeia, the latter of which, under the influence of hydrochloric acid, exchanges bromine for chlorine, yielding a corresponding chlorinated base, chlorotetracodeia; when, however, the action of hydrobromic acid is prolonged, methyl bromide is evolved in some little quantity. By digesting codeia with three or four times its weight of 48 per cent. acid for five or six hours on the water-bath, vapours were evolved, which condensed by the application of a freezing mixture to a colourless mobile liquid, the boiling-point of which was found to be 10·5° to 11·5°, and the vapour of which burnt with a yellow-edged flame, exploded violently with oxygen, forming carbonic and hydrobromic acids; it becomes, therefore, of interest to examine in detail the action of hydrobromic acid on each of the three bodies produced from codeia under its influence.

I. *Action of Hydrobromic Acid on Bromotetracodeia.*

When bromotetracodeia hydrobromate is heated in a sealed tube to 100° with four or five times its weight of 48 per cent. hydrobromic acid for from six to ten hours, methyl bromide is found as a thin layer on the top of the tarry contents of the tube after cooling; by dissolving this tarry substance in water, and fractionally precipitating the liquid by strong hydrobromic acid several times successively, nearly white amorphous flakes are ultimately obtained, resembling in all their physical and chemical properties the bromotetracodeia hydrobromate originally employed. After desiccation, first over SO_4H_2, and finally at 100°, there were obtained numbers which correspond with those required for a base bearing the same relation to morphia that bromotetracodeia does to codeia; it is, therefore, provisionally named bromotetramorphia.‡

* Read before the Royal Society, June 15, 1871.

† Proc. Roy. Soc., vol. xxi. p. 317; PHARM. JOURN. 3rd Ser. Vol. I. pp. 867, 886.

‡ All combustions given in this paper were made by lead chromate and oxygen; except where otherwise stated, chlorine and bromine were determined by boiling with silver nitrate and nitric acid.

Hence the action of hydrobromic acid on bromotetracodeia is

$$\underbrace{C_{72}H_{83}BrN_4O_{12}}_{\text{Bromotetracodeia.}} + 4\,HBr = 4\,CH_3Br + \underbrace{C_{68}H_{75}BrN_4O_{12}}_{\text{Bromotetramorphia.}}$$

Carbonate of soda throws down from the solution of the hydrobromate a nearly white precipitate which rapidly oxidizes, and appears identical in all its physical properties and chemical reactions with bromotetracodeia.

When crude bromotetramorphia hydrobromate is precipitated by carbonate of soda, and the precipitate (after filtration and washing) redissolved in hydrochloric acid and fractionally precipitated twice or thrice by strong hydrochloric acid, white flakes free from bromine are ultimately obtained; these are the hydrochlorate of the corresponding chlorinated base, which is therefore termed chlorotetramorphia. After drying at 100°, numbers were obtained which led to the formula $C_{60}H_{75}ClN_4O_{12}, 4\,HCl$.

Converted into platinum-salt, and dried at 100°,—

0·4235 grm. gave 0·0840 Pt = 19·83 per cent.

The formula $C_{63}H_{75}ClN_4O_{12}, 4\,HCl, 2\,PtCl_4$ requires 19·72 per cent.

When codeia is heated on the water-bath with three parts of 48 per cent. hydrobromic acid for five hours, and the portion of the precipitate thrown down by carbonate of soda and insoluble in ether is dissolved in hydrochloric acid, and fractionally precipitated several times by excess of stronger acid, flakes are obtained which, on drying at 100°, yield numbers intermediate between those required for chlorotetracodeia and chlorotetramorphia, leading to the formula,—

$$C_{70}H_{79}ClN_4O_{12}, 4\,HCl.$$

Converted into platinum-salt, and dried at 100°,—

0·4830 grm. gave 0·0935 Pt = 19·36 per cent.

The formula $C_{70}H_{79}ClN_4O_{12}, 4\,HCl, 2\,PtCl_4$ requires 19·40 per cent.

Whether this is only a mixture of chlorotetracodeia and chlorotetramorphia hydrochlorates, or is one compound, is open to doubt: assuming that it is not a mixture, the name chloro-dicodeia-dimorphia might be applied to the base. It appears *à priori* probable that the following double series of bases should be obtainable by successive methyl eliminations:—

Bromotetracodeia	$C_{72}H_{83}BrN_4O_{12}$
	$C_{71}H_{81}BrN_4O_{12}$
	$C_{70}H_{79}BrN_4O_{12}$
	$C_{69}H_{77}BrN_4O_{12}$
Bromotetramorphia	$C_{68}H_{75}BrN_4O_{12}$
Chlorotetracodeia	$C_{72}H_{83}ClN_4O_{12}$
	$C_{71}H_{81}ClN_4O_{12}$
Chloro-dicodeia-dimorphia .	$C_{70}H_{79}ClN_4O_{12}$
	$C_{69}H_{77}ClN_4O_{12}$
Chlorotetramorphia . . .	$C_{68}H_{75}ClN_4O_{12}$

Out of these ten bases four have been prepared, and a substance corresponding in composition with a fifth (chloro-dicodeia-dimorphia) has also been obtained; but from the great similarity in properties between all the five substances and their high formulæ, it is clear that no certainty as to the purity of the missing intermediate bodies could exist, and therefore it was not thought advisable to attempt their formation.

II. *Action of Hydrobromic Acid on Bromocodide.*

When bromocodide hydrobromate (prepared by two hours' digestion of codeia with three times its weight of 48 per cent. HBr, precipitation by sodium carbonate, and extraction with ether, etc.) is heated with four to six parts of the same acid to 100° for five or six hours either in a sealed tube or in an open flask, methyl bromide is copiously evolved; the tarry product, dissolved in warm water, and precipitated by sodium carbonate, is for the most part insoluble in ether, the insoluble portion having all the properties of bromotetramorphia; the ethereal extract shaken with HCl or HBr yields a viscid liquid, which, on standing, becomes filled with crystals consisting apparently of a mixture of the hydrochlorates, or hydrobromates, of deoxycodeia and a lower homologue, the latter predominating when the digestion is performed in an open flask. Attempts to prevent the formation of the lower homologue by continuing the digestion with HBr for only two or three hours did not succeed, as the large quantity of unaltered bromocodide in the ether extract obtained prevents the separation of the crystalline hydrochlorate or hydrobromate of deoxycodeia, and hitherto no method of separating the deoxycodeia salt from its lower homologue has been arrived at.

The following numbers were obtained by the analysis of these crystals after re-crystallization from hot water to free them from adhering bromocodide salt:—

Specimen A, prepared in sealed tubes, digested six hours at 100°:—

0·3185 grm. gave 0·7850 CO_2 and 0·1970 H_2O.
0·2200 grm. gave 0·1025 AgCl.

Specimen B, prepared in an open flask, digested six hours at 100°:—

0·2825 grm. gave 0·6920 CO_2 and 0·1660 H_2O.
0·2260 grm. gave 0·1085 AgCl.

Calculated.						Found.	
Deoxycodeia.			Deoxymorphia.				
C_{18} . . .	216	67·60	C_{17} . . .	204	66·77	67·22	66·80
H_{22} . . .	22	6·89	H_{20} . .	20	6·55	6·87	6·54
N . . .	14	4·39	N . . .	14	4·59		
O_2 . . .	32	10·01	O_2 . . .	32	10·47		
Cl . . .	35·5	11·11	Cl . . .	35·5	11·62	11·53	11·83
	319·5	100·00		305·5	100 00		
$C_{18}H_{21}NO_2HCl$			$C_7H_{19}NO_2HCl$				

The hydrobromate, prepared from the same batch as specimen B above, gave the following numbers after drying at 100°:—

0·3260 grm. gave 0·7010 CO_2, and 0·1720 H_2O.
0·2730 grm. gave 0·1465 AgBr.

Calculated.						Found.
Deoxycodeia.			Deoxymorphia.			
C_{18} . . .	216	59·34	C_{17} . . .	204	58·29	58·64
H_{22} . . .	22	6·95	H_{20} . .	20	5·71	5·86
N . . .	14	3·84	N . . .	14	4·00	
O_2 . . .	32	8·79	O_2 . . .	32	9·14	
Br . . .	80	21·89	Br . . .	80	22·86	22·83
	364	100·00		350	100·00	
$C_{18}H_{21}NO_2, HBr$			$C_{17}H_{19}NO_2, HBr$			

From the above numbers, and more especially from the percentages of H, Cl, and Br found, it appears that while specimen A may have contained some little quantity of deoxycodeia, specimen B must have consisted almost wholly of the lower homologue; to this body the name deoxymorphia may appropriately be given (provisionally), to indicate that its composition bears the same relation to that of morphia as deoxycodeia to codeia.

The numbers required for apomorphia salts are very close to those actually obtained above, viz., for hydrochlorate C = 67·22, H = 5·93, Cl = 11·70; and for hydrobromate C = 58·62, H = 5·17, Br = 22·99; but the entire absence of emetic properties in all these specimens, as observed by Dr. Michael Foster, conclusively proves that this base could not have been present.

Further research is required before it can be decided with certainty which of the three oxygen atoms in codeia is removed in the formation of deoxycodeia; the production of deoxymorphia with simultaneous evolution of methyl bromide, however, indicates that the oxygen that links the methyl group to the rest of the codeia residue is still present in deoxycodeia and deoxymorphia, while the production of both from bromocodide renders the following formulæ probable:—

Codeia. $C_{17}H_{17}NO \begin{cases} OH \\ O.CH_3, \end{cases}$ Bromocodide. $C_{17}H_{17}NO \begin{cases} Br \\ O.CH_3, \end{cases}$

Deoxycodeia. $C_{17}H_{17}NO \begin{cases} H \\ O.CH_3 \end{cases}$ Deoxymorphia. $C_{17}H_{17}NO \begin{cases} H \\ OH; \end{cases}$

so that deoxycodeia probably bears to codeia the same relation as free hydrogen, H_2, to water, $H.OH$; or as acetic acid, $\frac{CH_3}{CO.OH}$, to glycollic, $\frac{CH_2.OH}{CO.OH}$; bromocodide corresponding similarly to hydrobromic acid, HBr, or to bromacetic acid, $\frac{CH_2Br}{CO.OH}$.

Experiments are in progress to gain further insight into the structure of the group $C_{17}H_{17}NO$. By the action of hydriodic acid on codeia methyl is eliminated as iodide, and the elements of free hydrogen and those of HI are added on to this group; from which, as well as from the easy polymerization to form tetracodeia bases, it appears probable that some at least of the 17 carbon atoms are connected together somewhat after the fashion of ethylene or acrylic acid, which unite readily with HI, HBr, H_2, etc. Again, the oxidizing action of $AgNO_3$ on chlorotetramorphia is accompanied by the production of CO_2, which renders it not improbable that the third oxygen atom exists either as the group $[CH(OH)]''$ or as CO''.

On carefully examining, side by side, the qualitative reactions of the hydrochlorate B and those of a specimen of pure deoxycodeia-salt from codeia (without evolution of methyl bromide), not the slightest difference was discernible between the two; in their physiological actions, too, as observed by Dr. Michael Foster, the two bodies seemed perfectly alike, both being utterly dissimilar from apomorphia, from which in all other respects (qualitative reactions, percentage, composition, etc.) they differ either not at all, or extremely little.

(*To be continued.*)

THE MODERN ASPECTS OF THERAPEUTICS.*

BY WALTER G. SMITH, M.D.

It must be allowed that the reproaches which have been so often levelled against the *practice* of medicine have had much foundation in the past history of therapeutics, and all will re-echo Sir T. Watson's opinion, that "certainly, the greatest gap in the science of medicine is to be found in its final and supreme stage—the stage of therapeutics." Some of its keenest satirists have been physicians of the highest eminence and most varied acquirements, and, on the whole, it must be admitted, that the improvement of therapeutics, contrary to the other arts and sciences, "bears no proportion to its antiquity." It is the consciousness of this disproportion which damps the spirits of so many in the profession, and which has led to so much distrust and doubt. Dr. Radcliffe used to say that "the whole art of physic, for which he had a profound contempt, might be written on one sheet of paper," and it is not so long since the late Sir W. Hamilton, of Edinburgh, asked the question:—"Has the *practice* of medicine made a single step since Hippocrates?" a revival of the older query, *an datur ars medicinæ?*

There are many evidences that the need for a more careful study of therapeutics is urgently felt by the body of the profession at large. In 1865, the physiological sub-section of the British Medical Association drew up a memorial to the General Medical Council praying the Council "by pecuniary grants, and the appointment of suitable persons, to undertake investigations into the physiological action of medicines." This memorial was supported in the council by the Regius Professors of Physic in the Universities of Dublin and Oxford, but was negatived on the ground of want of powers in the council to comply with the petition.

A sub-committee was then appointed by the British Medical Association, and the results of its labours are seen in the elaborate report brought out by Dr. Hughes Bennett, on the action of mercury, podophyllin, and taraxacum on the biliary secretion. About the same time the Royal Medical and Chirurgical Society intrusted the examination of the method of subcutaneous injection to a committee, and the valuable observations embodied in their report furnish the most satisfactory data which we possess respecting this method. Quite recently the Medical and Psychological Association of Edinburgh have appointed a committee for the purpose of taking into consideration, among other things, the medical treatment of insanity, and they suggest propositions for combined therapeutical investigation, and ask for special information on the action of chloral. The Clinical Society of London owes its establishment in 1868, to the expressed want of more real knowledge on the various remedies in daily use, and the appearance of numerous detached papers, and of some works of merit on the doctrines and requirements of therapeutics testify to the deep-seated interest which now attaches to the prosecution of this subject.

I propose, now, briefly to inquire what are the resources at our command, and how far it may be said that therapeutics has advanced within the last quarter of a century, what are the hindrances to its progress, and, more particularly, in what directions we may hope for still further and more solid advances than have yet been gained.*

To avoid entering upon too wide a field my observations will be chiefly confined to the domain of what may be called medicinal therapeutics, *i. e.*, of remedial agents as directly applied to the treatment of disease, and accordingly the steady progress and increased knowledge of sanitary science and preventive medicine, the splendid results of operative surgery, and the development of state medicine, will be passed over without comment.

The retrospect of the history of therapeutics for centuries past, is, in many respects, not encouraging, and one can scarcely help wishing that much, if not most, of what is called the accumulated experience of ages were swept clean out of remembrance, so overladen is it with confusion, misstatements, and unproven theories. In fact since the prevailing ideas as to the action of drugs became in some degree fixed at a time when pathology was less exact than it is now, when there were no such accurate means of testing the real effects of remedies, and when physics and chemistry were in their infancy, we cannot avoid insisting on the necessity for renewed observations, carried out under better auspices, and with a better directed aim.

Yet it will be conceded that the materia medica abounds in agents by means of which very remarkable effects can be produced on the human frame, and a speculative mind might engage itself in showing that the possession of such powers by various medicines is an argument in favour of our being intended to exercise a due control over the progress of disease. Even as it is we can, at will, exalt or depress the action of the heart, the great fountain of life, and can, to some extent, control the capillary circulation; we can compel the stomach to eject its contents, and the intestines to discharge their excreta. We have agents that act on special functions

* Thesis for the degree of M.D., 1870. Read before the Medical Society of the College of Physicians, March, 1871.

* For many suggestions I am especially indebted to, and have largely made use of Sir W. Jenner's admirable address on medicine, delivered last year in Leeds, and Dr. Rogers' recent able work on therapeutics.

of the encephalon, on the spinal cord, on the sensitive nerves, and purely on the motor nerves. By suitable means we can increase or diminish the exhalation from the skin and mucous membranes, and can alter in quality and quantity the secretions of many important glandular organs. At pleasure we can contract or dilate the pupil of the eye, can stimulate striped and unstriped muscles, can poison some internal parasites with certainty, and can aid in the elimination of metallic poisons from the body. And, let it be observed, that not only have we these and other powerful means at our disposal, but that, in many, very many cases, we have the knowledge *how* to apply them to the treatment of disease with benefits which cannot be gainsaid, and in a few cases we know *why* we so apply them.

Our theories as to the nature of disease are undergoing a profound change, necessarily followed by corresponding modifications in the way in which we endeavour to meet or anticipate it. The notions of elimination and allopathy, of antidotes and of counter-irritation, have all their measure of truth, and are all usefully applied in practice, but it is to be hoped that none of them will ever again be raised to the rank of a system to cramp and fetter our ideas. As a positive and well-founded advance in the doctrines of therapeutics, it could easily be shown that certain injudicious or noxious lines of treatment have been abandoned, and that, in general, the habit of over-drugging has been given up. This beneficial change is due partly to a more accurate acquaintance with the local causes of disease, *e.g.* the parasitic skin diseases, partly to a more intimate knowledge of the pathology of disease, *e.g.* chronic pulmonary phthisis, and partly to a recognition of the principle that we are not to treat our patients as so many sponges doomed to soak up the maximum quantity of medicine possible, but, as living beings, whose functions are disordered by disease, and whom we seek to restore to health by aiding the natural tendency to recover, and by striving to modify the direction of action of the natural forces of the body. We know now that a large number of acute diseases occurring in previously healthy persons naturally run a definite course and tend to spontaneous recovery, in the absence of or even in spite of misdirected drugging, and we have recognized that certain acute diseases supposed to be of indefinite duration lie within appointed limits. We, therefore, by this advance in knowledge, avoid drawing false conclusions as to the efficacy of drugs in particular maladies, and although we do not pretend to be able to strangle acute disease by specifics, or suddenly arrest the cycle of morbid action, much still remains for our art in meeting special symptoms and controlling intercurrent complications. Sometimes advances in knowledge teach us a more correct appreciation of the composition and mode of action of drugs, or at least displace a faulty explanation. This certainly is a gain, and we know too little yet to see how far the application of the physical processes, dialysis, diffusion, and osmosis may before long enlighten some of the dark recesses of therapeutics.

Among the tributes levied from chemistry and natural history, we can reckon carbolic acid and its compounds, the alkaloids, the bromides, permanganate of potassium, sulphurous acid, and the sulphites, the whole group of anæsthetics, chloroform, ether, bichloride of methylene, nitrous oxide, and nitrite of amyl, Calabar bean, glycerin, pepsin, santonin, podophyllum, and lastly chloral, and its allies bromal and iodal. The mention of the class of alkaloids suggests the thought that very great benefit would, doubtless, accrue from the more extended use of the alkaloids in the room of the crude vegetable products from which they are derived. Our therapeutical experience would be rendered infinitely more accurate by the employment of these definite active principles which are chemically stable, and whose dosage can be exactly proportioned, and the differences which are often asserted to exist between the active principle and the crude drug itself would doubtless be found to be much less considerable than is generally thought. In the case of belladonna and conium, for example, the efficacy of these drugs is fairly and fully represented by their respective alkaloids, and even in the case of a complex substance like opium which contains several organic bases of different properties, it would be quite possible, after proper investigations to combine these bases in a compound solution so as to represent perfectly the action of the crude opium. As illustrations of the confirmation and extension of the curative powers of single drugs we can adduce the mass of evidence that now exists as to the respective value of mercury and iodide of potassium in different stages of syphilis, and of mercury especially in infantile syphilis, of the utility of arsenic in the *relapsing* skin diseases, of bromide of potassium in epilepsy, and certain other abnormal conditions of the brain and sexual organs, of quinine in periodic diseases other than ague, and of ipecacuanha in dysentery. We are better acquainted with the action of digitalis, opium, belladonna, hyoscyamus, and conium, and there is a clearer understanding gaining ground as to the worth and indications for the employment of alcohol in the treatment of disease.

The uses of iodide of potassium have been brought into greater prominence, and have been more sharply defined, and amongst the results "we may boast the disappearance of radesyge in Norway, of yaws in our West Indian colonies, and of most of the severe forms of tertiary syphilis at home." Since the more important of these drugs are of quite recent introduction, they are to be looked on as but an earnest of the harvest we are yet to reap from the domain of the natural sciences. Improved modes of administration are only second in importance, and hypodermic injection is an aid for which we cannot be too grateful, triumphing especially in the relief of painful and spasmodic affections. Lastly, a discrimination between the properties and uses of the direct and induced currents, *i.e.* of galvanization and faradization, has led to most important and gratifying results in the treatment of such formidable diseases as epileptiform neuralgia, infantile paralysis, and progressive muscular atrophy. It is proved that it is possible and feasible to galvanize directly the brain and spinal cord, and the galvanic irritation of the sympathetic nerve may yet furnish us with a powerful lever for controlling the nutrition of even remote parts.

Many circumstances have contributed to clog the progress of therapeutics, some of which belong to the inherent difficulties of its investigations, while others, and that a large portion, are due to the ignorance and incompetence of those to whom we should look for aid. The fallacies connected with the application of the inductive method of reasoning to the science of medicine, and the sources of error in practical and theoretical medicine, have been well exposed by Sir G. Blane and by Dr. Barclay, and I would merely remark that the principles enunciated by these authors, while they are the philosophical basis of the practice of physic, constitute the best answer to morbid scepticism on the one hand, and vulgar credulity on the other.

Faulty modes of preparation, and the use of entirely worthless compounds, are fruitful sources of error, and we can point in illustration to the investigations of Dr. Harley on the Galenical preparations of conium, in which he proves the absolute valuelessness of the extractum conii. Again, the assemblage of a number of active drugs in a prescription, often introduced at random, is destructive to a right appreciation of the effects of medicines; and, as a rule, the principle of combination should not be extensively tried till we are in a better position to estimate justly the influence of certain drugs on special diseases.

(*To be continued.*)

PRESSED BEEF AND DESICCATED BEEF-JUICE.

Baron Liebig conceived the idea of extracting from the wild cattle of South America those substances to which meat owes its characteristic properties, and conveying them to the ill-nourished populations of Europe. The so-called extract of meat was to be made, sent over to Europe, and distributed among the labouring classes, whose cheerless fare was thereby to be rendered stimulating, and equivalent to an animal diet. From the entire ox only eight or ten pounds of the Liebig's extract are procurable, but these eight or ten pounds of extract are very potent, and will animalize a mountain of vegetable food. The plan has, to some extent, answered. European food has been enriched with animal products from South America, and, in token of the success of the enterprise, the Liebig's Extract Company paid an 8 per cent. dividend some time ago. There are, however, difficulties in the way. The great bulk of the carcass—all the nutritive part, as distinguished from the stimulating extract—is thrown away, or converted into manure, and, in those hot climates, constitutes a serious drawback, involving considerable outlay for its proper disposal. On the other hand, the extreme concentration of Liebig's extract is a hindrance to its proper employment by the poorer classes in Europe. At present the benefit has been almost confined to invalids and the wealthy and middle classes, and has hardly reached the poorer people, who ought to be the chief recipients of it.

A new process for accomplishing the objects above referred to has just been brought out by Mr. Henley, a well-known engineer, and a company, called "The Pressure Meat Preserving Company," is being formed to work it.

Flesh, in its natural condition, consists of about 75 parts of water and 25 parts of solids. Mr. Henley proposes to remove the greater part of the water, whereby the meat will be reduced to one-half of its original weight (without loss of substance), and will be preserved at the same time. We have just tasted some of it, which had been kept for about a month in a chemical laboratory, and can speak to the soundness of its condition. The novelty in Mr. Henley's process is the employment of powerful pressure as a means of making the drying possible. In six hours the bullock which walks into the slaughter-house may be put on board ship in the shape of a highly dried pressed beef and desiccated beef-juice.—*The Lancet.*

ANNUAL DINNER OF THE EMPLOYÉS OF MESSRS. BURGOYNE, BURBIDGES AND CO.

The annual Excursion and Dinner of the persons employed by the above firm took place on Saturday last. The place selected for their visit was the Downs Hotel, Epsom.

Among the amusements provided for the entertainment of those present were walking, running and jumping matches, prizes for the winners in which were furnished by the liberality of the firm. One of these prizes was a handsome silver cup on an ebony stand; another, for the visitors—won by Mr. J. K. Pitt, the cork-merchant, —was an opera-glass. At the dinner-table the chair was occupied by Frederick Burbidge, Esq.

Indian Agriculture.—The culture of bamboo for paper-making and other purposes is being promoted by the Government of Central India. The Indian Government is buying land in the hill district of the Neilgheries for a spice plantation. Colonel Boddam has proposed the cultivation of the sunflower in Mysore. It is very successful in France. Government has sent out six more Scotch gardeners for experimental cotton-growing. These men have answered very well.—*Nature.*

THE PHARMACY BILL.

The following circular, treating of the views of the Manchester Defence Association on the present state of the question of poison regulations, and of the course it intends to take in the event of any further attempts at legislation on the subject, has been forwarded to us for publication:—

"63, *Piccadilly, Manchester, July*, 1871.

"Dear Sir,—The withdrawal of the Pharmacy Bill by the Government is a cause for congratulation to all the members of the trade who have so earnestly and effectually resisted its enactment. This result has been attained through the powerful opposition inaugurated by the Chemists' Defence Association, and carried on with so much unanimity and cordiality conjointly with the *Metropolitan* and *West of Scotland Defence Associations*, and promptly seconded by local organizations in all parts of the kingdom.

"It is the intention of this Association to continue its existence, to be ready to resist any future attempt on the part of Government to unnecessarily interfere with the internal management of our business.

"We have been much encouraged by the keen appreciation of the points at issue, and by the great amount of support we received from members of Parliament, and we unhesitatingly affirm that if opposition be again required, with the active and zealous assistance of friends throughout the country, we shall be able successfully to resist the passing of any measure, similar to or of so objectionable a character as that so happily withdrawn.

"We do not wish a renewal of the conflict, and we fervently trust that the wisdom of Government may obviate this necessity. Such a contest is undesirable, but we believe it to be our duty to boldly face the difficulty should it again arise, that our trade may retain its just measure of independence, be free from the undue and needless interference of the Privy Council, with the liberty to carry on our business with intelligent prudence and self-reliance which no arbitrary legal restrictions, however ably devised or fenced round with penal clauses, could so well secure.

"We take this opportunity of calling your attention to the fact that our opponents, whilst advocating with a zeal difficult to account for, the legal compulsory regulations for the storage and dispensing of poisons contained in the withdrawn Bill, have not been able, neither have they attempted, to bring forward any evidence that the public safety is jeopardized by the present condition of things, or that abuses exist to warrant Government in bringing forward the recent measure.

"It is incomprehensible how the declaration could be made by any person that the objections to the Bill had been completely removed by the amendments, whilst the penal clauses for the non-observance or infringement of the regulations, and the absolute power of the Privy Council and of the Pharmaceutical Council were retained. These are the essential principles contended against by this and kindred Associations, whose action has been endorsed by the approval of a vast majority of the chemists throughout the country.

"We trust that the question is settled, as we quite agree with the advocates for the imposition of the objectionable regulations that a settlement is desirable, and we hope that both they and the Medical Department of the Privy Council will read the signs of the times, and forbear the one from attempting to impose restrictions on our liberty alike unjust and unnecessary, and the others from encouraging such unwise attempts.

"We invite you to continue your membership of our Association if already enrolled, or to join our ranks, and by adding to our numbers to increase our influence, and sustain our efforts should the course of events require further action.

"Signed on behalf of the Executive Committee,

"ROBERT HAMPSON, *Hon. Sec.*"

The Pharmaceutical Journal.

SATURDAY, JULY 29, 1871.

Communications for this Journal, and books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed* "*Pharm. Journ.*"

THE PRESS AND THE PHARMACY BILL.

WHILE the leading medical journals maintain a discreet silence in reference to the fate of the Pharmacy Bill, which is at least consistent with the prevailing difference of opinion among those to whom it applies more especially, there is one exception to this course which we cannot omit to notice because it appears to be a totally unnecessary and gratuitous attempt to aggravate a contest which is already too dominant.

The journal to which we refer not long ago announced that Mr. FORSTER had only to lift his finger to make the Pharmacy Bill law, and at the same time predicted that he would do so in spite of everything. To such expressions of opinion or desire we offer no objection, but we do strongly protest against such perverse misrepresentation and defamatory comments as the following, where the same journal declares that this Society—

"has cast away any claim they might have had to consideration, and we trust Mr. Forster will trouble himself no longer with diplomacy, but exercise all his influence to do justice, whether the chemists and druggists like it or not. A larger issue than poison-protection is at stake, for it has now to be decided whether the Government is able to deal *with an opposition dictated, not by any principle, but by self-interest and carelessness for the public interest.* We never doubted that Parliament will support the Government in the effort, and we do not think that the fatuous proceedings of the Society have even the prospect of success to excuse them."

The italics are our own, but we abstain from comment on the quotation, since that would involve the use of more emphatic terms than we desire to appear in these pages, and because we think republication of the paragraph will alone ensure the condemnation it deserves.

Equally objectionable are the following remarks, given editorially in the same journal this week:—

"Mr. Forster makes rather a poor show just now. He talked very loud, and blustered a good deal, and now his superior officer, without hesitation, puts a stop to his threatened onslaught. Meanwhile, we are encouraged to see that the 'Party of Order,' who have voluntarily adopted precautions against poisoning, and don't wish to be slovenly, are coming to the point, and the *Pharmaceutical Journal* is, after the example of the *Times*, throwing out feelers for a change of policy from opposition to adhesion. A letter in favour of the amended Bill is published in that periodical this week, and it bears the signatures of almost all the large respectable chemists in London, and many in the country. Thus the opposition is narrowed to the limits of the small retail druggists, and loses so much of its force that we have reason to believe that it will lack power eventually to defeat the reform."

We cannot perceive the necessity for the tone manifested by these quotations, and feel convinced that the treatment of the subject in such a manner is extremely mischievous and reprehensible.

The *Ashton Reporter*, in an article on this subject, takes the view held by opponents of the Bill, and after remarking that the honourable members of her Majesty's Privy Council are not those to whom the best method of storing and dealing with poisons—or, as it may be expressed, the best shop-keeping arrangements—are very likely to occur, goes on to say—

"Even the medical department of that body has no practical acquaintance with the subject. Quite as suitable would it seem for the chemists of the kingdom to issue regulations for the surgeons or dentists in their difficult operations, or to venture upon a bolder stroke, and give advice to her Majesty's Privy Councillors upon the despatch of public business. Notwithstanding the incongruity, however, Government stood committed to a Bill which undertook to teach chemists a very elementary, though responsible, branch of their business. This could not be borne. Of course the trade was convulsed, and resisted the threatened interference. Petitions were hastily and numerously signed, and deputations from all parts of the country were despatched to confer with members of Parliament in London. A few days' canvass satisfied the resisting body that the Pharmacy Act never could pass the Commons. Here and there a hanger-on by authority attempted to justify the measure, but several influential representatives, headed by Mr. Jacob Bright, who introduced a large deputation, were received by Mr. Forster, and frank explanations were given, strengthening the opinion that the Pharmacy Bill must be either amended or withdrawn. Conspicuous by his courtesy and heartiness amongst those who accompanied the deputation to the Minister was Mr. T. W. Mellor, member for Ashton. He had presented a petition to Parliament, signed by every chemist in this borough, where chemists are supposed to be equally alive to their own and the public interests; and had placed his services very warmly at the disposal of his constituents to frustrate this scheme of surplus legislation. The Minister listened with attention, and promised further consideration of the measure. Meanwhile agitation spread, and members of Parliament were urged by petition and remonstrance, as well as by deputation, to resist the Bill. The opposition was becoming formidable, and the situation somewhat ridiculous. Here was the Privy Council trying to arrange the shelves of a druggist's shop. *Punch* might be on the look-out for a cartoon. Yielding to the great pressure from without, or perhaps awakening to the consciousness that the trained and experienced servants of the public are the best qualified to discharge responsible duties, an amended Bill was substituted for the original. This amended Bill, born in an emergency, survived only a few hours, and is already in an advanced state of decomposition. The public did not ask for it, and does not need it. The trade is able to take care of its poisons, and of itself. The Government has more legitimate children than it can provide for, and certainly members of Parliament, especially those of the opposition, must have perpetrated a certain deed had not these poor little Bills, by crowd-ing together at the close of the session, happily smothered each other.

"English institutions, like Englishmen, flourish the best away from the shade of Governmental protection or management. They require but freedom from restraint, and fair opportunities for development. Let there be a sense of duty and responsibility leading up to self-reliance and effort, and these will prove the surest guarantees both of personal success and of public advantage. A Pharmacy Bill that should substitute routine for alert attention would be fraught with inevitable mischief. A merely mechanical system, enforced by extraneous authority, is vastly inferior to a system which has grown up with existing requirements, and been gradually adapted to them. We do not pretend to say that the hands which are trusted to mix our physic and vend our poisons are always wisely guided, but upon the whole we would rather commit ourselves in such matters to the care of a very ordinary chemist than incur the risk of being experimented upon by an extraordinary Privy Councillor; and hence we congratulate our readers upon their deliverance from the Amended Pharmacy Bill."

THE METRIC SYSTEM OF WEIGHTS AND MEASURES.

The decision of the House of Commons on Wednesday rejecting the Bill to establish compulsorily the Metric System of Weights and Measures, brought in by Mr. J. B. Smith, is probably not entirely unsatisfactory to the supporters of the measure. That the second reading should be refused only by the small majority of five, notwithstanding the attempt of the Government to shelve the Bill, by a promise to deal with the subject next year, appears to show that public opinion is gradually tending in favour of the adoption of some such plan. For the convenience of our readers we give a short *résumé* of the Bill. It proposes that after a time fixed by Parliament the present imperial and all local or customary weights and measures shall be abolished, and the metric system, which is now permissive, shall be made compulsory. To this end, it directs that the unit of lineal measurement shall be the "metre," verified by comparison with the original standard in Paris; that the unit of surface measurement shall be the "are," equal to the square of ten "metres;" that the unit of the measure of capacity, for liquids and dry goods, shall be the "litre," equal to the cube of the tenth of the "metre," and that the unit of weight shall be the gram, of which a standard is to be prepared, to be verified by comparison with the original standard in Paris.

At the expiration of the time fixed, it is to be illegal to use any other denomination of weights and measures than those specified in the Bill, under a penalty of ten shillings for each offence. Any person who shall print any price list or price current, or any journal or other paper containing a price list or price current, in which the provisions of this Bill are not complied with, is to be liable to a penalty of ten shillings for every copy of such price list, price current, journal or other paper he shall publish.

The Bill also provides for the preparation and publication of accurate tables of comparison, showing the proportions between the weights and measures and those proposed to be established by the Bill.

The names on the Bill, besides Mr. J. B. Smith, are Sir Charles Adderley, Sir Thomas Bazley, Mr. Graves, Mr. Baines, Mr. Albert Pell, Mr. Muntz and Mr. Dalglish.

Of course, in the discussion of so wide and important a question, it is desirable that every argument should be carefully considered; but we are sorry to notice the appearance of an intention to make political capital out of it by an affected consideration for the convenience of the lower classes, and the suffering and loss the Bill would entail upon them. To use an illustration given by one honourable member, and with all deference to those who urge this view of the question, we think it very problematical a working man would continue to pay for the half-litre of beer the same as he now pays for a pint, although he would only receive about seven-eighths of the quantity. Such matters would undoubtedly be regulated by the ordinary law of supply and demand. By the way, a daily contemporary strongly opposed to the Bill, gives proof of its capability for dealing with the subject, by reporting that the half-litre is equal to "8·3-tenths" of a pint, a jumble that many of those whom it assumes to patronize would be competent to set right.

BRITISH PHARMACEUTICAL CONFERENCE.

The following are amongst the papers promised to be read at the Edinburgh meeting:—

On the Tincture Press. By Mr. C. A. Staples.

On the Compound Mixture of Iron of the British Pharmacopœia. By Mr. C. A. Staples.

On a Method of Obtaining Distilled Water Economically. By Mr. C. A. Staples.

The Composition of the Bottled Mineral Waters of Commerce. By Mr. F. M. Rimmington.

Pharmaceutical Ethics—Apprenticeship. By Mr. S. R. Atkins.

Certain Derivatives from Codeia. By Dr. Wright.

Report on the Purity of the Peroxide and Hydrated Peroxide of Iron of Commerce. By Mr. A. H. Allen.

Report on the Permanganate of Potassium of Pharmacy. By Mr. A. H. Allen.

On Solutions. By Mr. T. B. Groves, F.C.S.

On Linseed. By Mr. Greenish.

Remarks on the Proposed Changes in the Chemical Nomenclature of the Pharmacopœia. By Mr. C. R. C. Tichborne, F.C.S.

Examination of Samples of Commercial Chloral Hydrate. By Mr. M. M. Patteson Muir, F.C.S.

On Crystalline Principles in Aloes. By Professor Dr. F. A. Flückiger.

Notes on Aloes—No. II. By Dr. W. A. Tilden, F.C.S.

Report on the Chloral of Trade. By Mr. A. H. Mason, F.C.S.

Pharmaceutical Notes on *Rhamnus Frangula*, Linn. By Mr. Baildon.

ADAMSON INSTITUTE.

Under this name a memorial will shortly be erected at St. Andrew's to the late John Adamson, M.D., as an acknowledgement of his services to the cause of science, particularly chemistry and natural history, in that ancient university town.

A correspondent of the *Lancet* appeals to the Editor under the following circumstances:—

"Sir,—I am a gentleman by birth and education. For a certain love to science I chose the medical profession. My experience of it was chiefly rural, where the patient and the doctor are brought legitimately together. My fate led me to purchase a practice in London, and, to my surprise I find myself surrounded with all the appliances of trade—coloured bottles, scents, tooth-brushes, small-tooth combs, treacle, etc. The very practice I entered upon was not without some of these adjuncts. I quickly expelled the coloured globes, and cut down the retail to a minimum. But what am I to do in competition on all hands with more showy establishments? Am I rightly informed that the medical men who are engaged in hospitals, dispensaries, etc., without any salaries, to attend the poorest in the land, are themselves obliged to live as respectable professional men, and eschew trade altogether? If so, does it not appear much more reasonable that we who have to attend the middle and upper classes for considerable payment should ourselves be compelled by some law of the colleges and schools to live as gentlemen, and, while we practise a liberal profession, to leave trade to those to whom it properly belongs?

"Any suggestions will be thankfully received by,

"Your bewildered servant,

"Dilemma.

"P.S.—Some of my neighbours label their windows that they make up medicines ordered by other medical men. Is this professional?"

We notice that the Editor of that journal discreetly omits to give any advice or opinion.

The *Lancet*, under the heading "Spectroscopy in the Law Courts," has the following remarks concerning Mr. Stoddart's recent letter to this Journal* upon the subject of the recognition of blood-stains by the spectroscope:—

"Mr. Stoddart . . . asks us to point out some substance giving a spectrum coincident with that of blood. We cannot gratify him by doing so; but, as we said before, the whole subject of the spectra of coloured liquids is not yet sufficiently well explored to admit of the employment of spectroscopy for the decision of a capital charge. We cannot agree with Mr. Stoddart in thinking that the mistake which two of our best spectroscopists made relative to the spectrum of the mythical Jargonium is unconnected with the question of the degree of confidence to be reposed in the indications of spectroscopy. Before we accept a given absorption spectrum as absolute evidence of the presence of blood, we should know that it is safe to trust to absorption spectra; and in Jargonium we have had a practical example of the results of trusting to them."

The *Scotsman* announces that arrangements are being actively proceeded with in a large number of towns in Scotland for celebrating the centenary of Sir Walter Scott. At the approaching festival, deputations will be present from the corporations of several towns in the north of England, the Caledonian Societies in London and Liverpool, and the Speculative Society of the University of Edinburgh, of which Sir Walter Scott was the Secretary. A great number of the nobility and gentry, as well as several ladies and gentlemen distinguished in art, science and literature, have intimated their intention of being present. An elaborate design for a memorial card has been designed by Sir Noel Paton, a copy of which will be presented to every member of the company as a memento of the occasion. The Jedburgh Town Council has appointed a committee to make the necessary arrangements for celebrating the centenary. Also, at a public meeting at Langholme, it was unanimously decided to hold a demonstration in honour of Sir Walter Scott on the 15th of August.

* See Vol. I. p. 1044.

At an interview of several gentlemen interested in the petroleum question with Earl Morley on Monday last, his lordship intimated his intention to reduce the test standard in the Petroleum Bill now before Parliament to 80° F., and to provide that such portion of the Act as relates to the test shall not come into force until February 1, 1872.

The recent case of poisoning by eating Calabar beans, a notice of which will be found in our Journal, leads us to ask the question, how is it that so important a subject as the history and uses of articles of commerce is not taught in schools? If it were, such accidents would be almost unknown. In Germany it forms part of the instruction of boys at school, the great aim being to supply a knowledge of the different substances they will meet with or have to use during life. They thus enter the warehouse or shop with a fair amount of merchant's knowledge. We trust that these object lessons will not be forgotten by school boards.

The Committee of St. Mary's Medical School has decided to establish three Scholarships in Natural Science open to public competition, each of the annual value of £40, and tenable for three years. *Nature* states that the first of these, and an annual exhibition of £20 will be awarded by open competitive examination in September next.

We learn from *Nature* that the Royal Commission on Scientific Instruction and the Advancement of Science has adjourned till November, and that the publication of some of the evidence already taken may shortly be expected.

Transactions of the Pharmaceutical Society.

FIRST OR PRELIMINARY EXAMINATION.

The Questions for the Preliminary Examination on July 3rd were as follows:—

LATIN.

Translate into English two or more of the following sentences:—

1. Quod ubi Cæsar rescivit, quorum per fines ierant, his, uti conquirerent et reducerent, si sibi purgati esse vellent, imperavit: reductos hostium numero habuit; reliquos omnes, obsidibus, armis, perfugis traditis, in deditionem accepit.
2. His rebus cognitis, Cæsar Gallorum animos verbis confirmavit, pollicitusque est sibi eam rem curæ futuram: magnam se habere spem, et beneficio suo et auctoritate abductum, Ariovistum finem injuriis facturum.
3. Hydrargyrum cum confectione tere, donec globuli non amplius conspici possint; deinde, adjectâ glycyrrhizâ, omnia simul contunde, ut fiat massa.
4. Divide in partes duodecim, quarum capiat unam secundâ vel tertiâ quâque horâ, ex cyatho parvo lactis vaccini recentis, absente febre.
5. State the superlative degree of each of the following adjectives:—*bellus*, *deterior*, *meritus*, *novus*, and *superus*.
6. Decline the pronoun substantive *tu*.
7. State the gerunds, supines, present and future participles of the verb *sumo*, to take.
8. What case do verbs of giving and restoring govern? Give one or more examples.
9. What case do the following adverbs of place govern: *nusquam*, *longè*, *quo*? Give examples.

ARITHMETIC.

10. Write down in proper figures the following numbers:—one hundred, thirty-two thousand, two hundred and forty-five.
11. How many miles will a person walk in 63 years, supposing he travels 6 miles each day, and there are 365 days in a year?
12. If 40 acres of grass be mowed by 8 men in 7 days, how many acres can be mowed by 24 men in 28 days?
13. Divide $9\frac{2}{11}$ by $\frac{1}{2}$ of 7.
14. Multiply ·907 by ·0025.

ENGLISH.

15. What does orthography teach?
16. Explain the difference between proper and common nouns, and furnish examples.
17. What does the subjunctive mood express? Exemplify the same.
18. Correct the following:—Luxurious living and pleasure begets a languor and satiety that destroys all enjoyment.—Neither discipline nor precept are so forcible as example.
19. Parse the following:—Among the enemies of friendship may be reckoned suspicion and disgust.
20. Write from 15 to 25 lines upon *one* only of the following subjects:—

A. Worldly prosperity.
B. Sources of happiness.
C. Contentment.

ERRATA.—Page 73, col. 1, line 35, *for* Bowers, Joseph William, *read* Williams, Joseph Bower. *After* Sandy, Frederick William, Strood (line 39), *insert* Jones, James, Carmarthen. Page 74, col. 1, line 17, *for* Landell, *read* Sandell.

Provincial Transactions.

BRISTOL PHARMACEUTICAL ASSOCIATION.

The Annual Meeting of this Association was held on Thursday, July 20th; Mr. STODDART, President, in the chair.

After some routine business, the Hon. Secretary, Mr. SCHACHT, read the following Report of the Council:—

"The Council of the Bristol Pharmaceutical Association have great pleasure in presenting to the members their Second Annual Report. The 10th rule of the Association indicates the chief duty of the Council to lie in two directions of work,—1stly. The provision of the best means at their disposal for the systematic teaching of the sciences connected with their calling; and, 2ndly. The keeping alive, by a series of appropriate evening gatherings, the general interest of the members in the prime object of the Association, 'the progress of scientific pharmacy.'

"With regard to the latter portion of these duties, the Council have to report that the past session in no way fell short of the excellence reached by its predecessor. Through the kindness of the President, Mr. Stoddart, Mr. Coomber, Mr. Leipner, Mr. Lant Carpenter, and Dr. Tilden, the monthly evening meetings were rendered highly attractive, and good attendances gave evidence of the estimation in which these gentlemen's efforts were held. They have well earned the gratitude of the entire Association, and have deserved its warmest thanks.

"Had the practical papers from the general body of the members on the occasions set apart for the purpose been a little more numerous, the Council would have had unmixed pleasure in congratulating the Association upon this portion of its operations. Unfortunately they received but very few, and are compelled to refer to the subject in the hope that this deficiency may be made good in future sessions.

"With regard to the other portion of their duties, the Council have to report that their arrangements were the same as were made in the previous year. Full courses of lectures upon each of the two departments of chemistry and of botany were delivered by the respective professors of these sciences, Mr. Coomber and Mr. Leipner, and they were well attended. For the lectures on chemistry twenty-three of our associates entered. Of these, ten went in for the Government examinations in May. In one division of the subject five passed, all in the first class; and in the other division, one passed in the first class and three in the second.

"For the lectures on botany fourteen associates entered. Of these, eight went in for the examinations. In one division of the subject two passed in the first class, and three in the second; and in the other division five passed, all in the second class.

"The names of the successful competitors are as follows:—

"*Inorganic Chemistry.*—Mr. Little (1st class, advanced grade), Mr. Bishop (1st class, ditto), Mr. Tamplin (1st class, ditto), Mr. Samson (1st class, elementary grade), Mr. Bennett (1st class, ditto).

"*Organic Chemistry.*—Mr. Tamplin (2nd class, advanced grade), Mr. Little (1st class, elementary grade), Mr. Bennett (2nd class, ditto), Mr. Samson (2nd class, ditto).

"*Structural and Physiological Botany.*—Mr. Little (1st class, advanced grade), Mr. Bennett (1st class, elementary grade), Mr. Samson (2nd class, ditto), Mr. Bishop (2nd class, ditto), Mr. Tamplin (2nd class, ditto).

"*Systematic and Economic Botany.*—Mr. Little (2nd class, advanced grade), Mr. Tamplin, Mr. Baynham, (equal, 2nd class, elementary grade), Mr. Bennett (2nd class, ditto), Mr. Samson (2nd class, ditto).

"And the winners of the prizes are,—

"*Inorganic Chemistry.*—Advanced Grade:—1. Mr.

Little. 2. Mr. Bishop. Elementary Grade:—1. Mr. Samson. 2. Mr. Bennett.

"*Organic Chemistry.*—Advanced Grade:—Mr. Tamplin. Elementary Grade:—1. Mr. Little. 2. Mr. Bennett.

"*Structural and Physiological Botany.*—Advanced Grade:—Mr. Little. Elementary Grade:—Mr. Bennett.

"*Systematic and Economic Botany.*—Elementary Grade:—Mr. Tamplin, Mr. Baynham, equal.

"It is also with great pleasure the Council find themselves authorized to announce that the Department of Science and Art has selected one of these students, Mr. A. Little, for the honour of a silver medal in testimony of his success at the recent science examinations.

"In the last Annual Report hope was expressed that steps would soon be taken towards laying the foundations of a museum and library. The want of a definite home wherein to commence work has operated as a barrier to any great effort in this direction, but the subject has not escaped the attention of the Council; and now that the migration of the Philosophical Institution is complete, there is a greater probability of some arrangement being arrived at between the executives of the two Associations by which this desirable object may be promoted.

"The Council have once more to record their sense of obligation to the committee of the 'Bristol Museum and Library' for their uniform courtesy in granting them the use of their premises.

"With regard to the finances of the Association, the Council have only to remark that they have endeavoured in every way to preserve the strictest economy, and to expend the slender means at their disposal to the best advantage."

The Bristol Pharmaceutical Association in Account with
JOSEPH TAPLIN, *Treasurer.*

1870.	For the Year 1870 and 1871.	Dr. £. s. d.
Nov. 21.	To Paid Lecture, Fees to Professor Coomber	7 7 0
,,	,, ,, ,, ,, Professor Leipner	7 7 0
,, 23.	,, ,, Honorary Secretary for Stamps, etc.	1 8 6
,, 24. 1871.	,, ,, Postage of 31 Subscription Receipts by Treasurer	0 2 7
Jan. 7.	,, ,, Honorary Secretary for Stamps, etc.	1 0 0
,,	,, ,, Austin, for Printing	0 8 0
,,	,, ,, Arrowsmith, for ditto	1 14 6
May 10.	,, ,, Dr. Tilden's Expenses to Bristol and back	3 0 0
July 17.	,, ,, Arrowsmith, for Printing	0 18 0
,, 18.	,, ,, Treasurer (W. Sanders, Esq.) of Bristol Philosophical Institution, for use of Offices, etc., for Meetings and Lectures	10 0 0
,,	,, ,, Mr. Westaway, at ditto	1 1 0
,,	,, Cash in Treasurer's hands for Prizes to be given to successful Candidates at Examinations in Chemistry and Botany	8 0 0
,,	,, Balance in hands of Treasurer	19 11 1
		£61 17 8

1871.	For the Year 1870 and 1871.	Cr. £. s. d.
July 20.	By Balance from last Year	15 4 2
,,	,, Subscriptions for Current Year of 57 Members at 10*s.* 6*d.* each	29 18 6
,,	,, Subscriptions from 34 Associates at 5*s.* each	8 10 0
,,	,, Subscriptions from 25 Associates, being Lecture Fees, at 5*s.* each	6 5 0
,,	,, Subscriptions, Extra Lectures, Fees from 8 Absentees at Examination, at 5*s.* each	2 0 0
		£61 17 8

Balance in Treasurer's hands £19 11 0

Examined the above Account with the Vouchers, and found correct.

HENRY FARDON, *Auditor.*

Proceedings of Scientific Societies.

BRITISH PHARMACEUTICAL CONFERENCE.

The following gentlemen were elected members of the Conference by the Executive Committee on the 5th inst.:—

Aitken, Edinburgh; Albright, Lancaster; Allen, Sheffield; Amyott, Diss; Anderson, Edinburgh; Archbold, B., Berwick-on-Tweed; Armstrong, Bishop Auckland; Arnold, London; Ashton, London; Baker, W., Sheffield; Baker, G., Dover; Bannister, London; Barnes, Derby; Bartle, Gloucester; Bathersby, Lancaster; Beach, Redmarley; Bell, Manchester; Bloor, Derby; Blunt, Shrewsbury; Botham, Levensholme; Bowling, London; Braby, London; Bray, London; Brown, J., Stoke-on-Trent; Brown, R. S., Edinburgh; Butcher, Cheltenham; Cameron, Kelso; Cardwell, Lancaster; Challinor, Bolton; Clapham, Leeds; Clark, Lancaster; Cook, Edinburgh; Cooper, York; Corfield, St. Day; Coxon, Chester-le-Street; Croskill, Derby; Cross, Rochdale; Curtis, London; Daniel, Merthyr; Davidsen, Berwick-on-Tweed; Draper, London; Dunn, Leeds; Elliott, Plymouth; Else, Brighton; Evans, Derby; Farie, Bridge of Allan; Fletcher, Cheltenham; Flower, Bristol; Forth, Cheltenham; Forsyth, M. D., Greenwich; Foster, Brighton; Francis, Diss; Furneaux, Plymouth; Garty, London; Gee, Manchester; George, Merthyr; Gladding, London; Glossop, Bristol; Griffin, Brighton; Griffiths, Merthyr; Grimstead, Birkenhead; Groves, Cambridge; Guy, Brighton; Hall, Lancaster; Harcus, Newcastle; Hayhoe, Diss; Helliar, Yeovil; Heywood, London; Hill, J., London; Hill, W. H., Edinburgh; Hills, W., London; Holford, London; Holt, Liverpool; Ison, Derby; Jeffrey, Cheltenham; Johnson, C., Lancaster; Johnson, R. A., London; Jones, K. L., Bagillt; Kirk, London; Langdon, Plymouth; Lewellyn, Merthyr; Lewis, Merthyr; Lister, Chorley; Lord, Rawtenstall; Macfarlane, Edinburgh; MacGlashan, Edinburgh; Maclagan, Edinburgh; Macullum, Edinburgh; Matthews, Royston; Medley, Derby; Morris, Longton; Muir, Glasgow; Myers, Hull; Oakes, Chorley; Oglesby, York; Oulton, Tunstall; Palmer, London; Parker, T., York; Patchett, Leeds; Pattison, Newcastle; Payne, London; Peters, Gourock; Pickard, Manchester; Plumtree, Louth; Pollard, Ryde; Potts, Sunderland; Ratcliffe, Wolverhampton; Read, Peterborough; Reeve, Canterbury; Riddell, Morpeth; Ritchie, Edinburgh; Robertson, Edinburgh; Rogers, London; Rossiter, London; Salter, Devon; Samuel, London; Shepherd, Adlington; Shillinglaw, Birkenhead; Smiles, Edinburgh; Smith, J., Manchester; Smith, N., Cheltenham; Smith, R., Ferryhill; Spence, F., Manchester; Spencer, Newcastle; Stevenson, R., Derby; Stevenson, W., Todmorden; Stewart, Birkenhead; Stoddart, W. W. B., Bristol; Sugden, Manchester; Tanner, Liverpool; Taplin, London; Thomas, Boston, Lincolnshire; Thompson, Manchester; Thorburn, Bishop Auckland; Tigar, Northampton; Toone, Warminster; Turner, Hexham; Twemlow, London; Utting, Diss; Wall, West Bromwich; Walker, J. D., Carlisle; Walker, J. S., Manchester; Watts, D.Sc., Bowdon; Weir, Merthyr; Welch, Reading; Whitrod, Diss; Williams, J. B., Dudley; Williams, J. O., St. Ives; Wilson, Penrith; Wright, D.Sc., London; Wyley, Coventry.

MEETING OF THE GENERAL MEDICAL COUNCIL.

THE PHARMACOPŒIA COMMITTEE.

At the meeting of the Medical Council on Saturday, July 8th, the following Report of the Pharmacopœia Committee was read:—

"The Pharmacopœia Committee appointed by minute of the Council, July 12, 1869, beg to report that, owing to the pressure of important business during the sessions of the Council last year, no meeting of the Committee was held, and no report was prepared for their consideration by Dr. Redwood.

"The Committee met on the 7th inst., and received a report from Dr. Redwood, on the progress of pharmacy since the date of his last report. Some points of importance in connection with pharmaceutical preparations were discussed, and Dr. Redwood was requested to continue his services. It was also resolved that Dr. Christison, Dr. Quain, and Dr. Aquilla Smith be requested to continue their inquiries as regards additions or other changes in the Pharmacopœia, and that Dr. Redwood be requested, in addition to his duty of reporting on the progress of pharmacy, to investigate, from time to time, the composition of articles in the Pharmacopœia concerning which questions have been raised.

"As the sum of £75 remains as balance in the hands of the Committee, it will be unnecessary to ask the Council to place any further sum at the disposal of the Committee for use during the ensuing year.

"R. Christison, *Chairman.*"

Dr. Christison said the first paragraph stated why no report was presented last year. In fact, there was but little material about which a report could be presented. But during that year and the subsequent year useful information had been derived from various quarters, and the Committee were of opinion that all parties concerned in the Pharmacopœia should now get a stimulus to proceed and look after matters that might occur during the next twelve months. To this, he presumed, there would be no objection. He was happy to say they did not require to come to the Council for any allowance, as there were ample funds at command. There now remained only a debt of £104. 14*s*. The Pharmacopœia had a steady sale, and there was a sufficient number of copies to pay more than the debt. They were not entitled to make any profit from it, but simply wished to reimburse the Council for the outlay.

Dr. Quain seconded the motion.

Dr. A. Smith said that, although a member of the Committee, he was no party to the report. He never saw it until it appeared in the programme. He objected to the words "the Committee met on the 7th inst., and received a report from Dr. Redwood on the progress of pharmacy since the date of his last report." It was not a report "on the progress of pharmacy"; it was a report from Dr. Redwood on discussions which took place at the Pharmaceutical Society upon a communication made by him at the suggestion of the Committee two years ago. There was not a word about the progress of pharmacy; the report was mere waste paper. He should like to see the report state that Dr. Redwood had sent in a report to the Pharmacopœia Committee, and suggested that it should not be worded so as to appear that Dr. Christison, Dr. Quain, and himself recommended themselves for re-election.

Dr. Apjohn thought it would be desirable that the Committee should furnish the Council with a summary of their researches into pharmacy. It would seem that there had been no researches. Looking at the report it was so much waste paper, and tended to nothing except to mislead people who were not conversant with these questions into the opinion that experiments were in progress and researches had been made which would render the new edition a great improvement upon the old. If these researches had been made, and these improvements were ready, they ought to be laid before the Council.

Dr. Quain believed that the Pharmacopœia Committee had performed its duty as efficiently as the Council could wish.

Dr. A. Smith: No; I say, and I said before, that the work has not been done efficiently.

Dr. Quain said their duty was simply to take care that an accurate record of what was done in pharmacy was kept, and they had employed for that purpose the services of the gentleman under whose care and auspices the last Pharmacopœia was constructed, a Pharmacopœia which he need not speak of now that it was admitted to be the greatest success that had yet been accomplished in the form of a Pharmacopœia. They gave Dr. Redwood a very moderate payment, and he devoted himself to securing that the new edition should be as good as the last. He (Dr. Quain) had more faith in the opinion of Dr. Redwood than in that of either of the two gentlemen who had just addressed the Council. (Order, order.) He had more confidence in that gentleman's opinion than in that of either of the gentlemen with regard to the construction of a Pharmacopœia. (Hear, hear.) The Committee relied on Dr. Redwood to exercise careful vigilance over the progress of pharmacy, and whenever a new edition was required the new materials would be ready.

Dr. Smith said he did not insinuate one word against Dr. Redwood. He had the highest opinion of him, and was willing to admit his efficiency in every respect. He simply said it was not a report on the progress of pharmacy, and he would repeat the assertion.

Sir D. Corrigan suggested that in the next edition, after each article, its degree of solubility in water should be inserted. At present it was simply stated whether it was soluble, and not the degree of its solubility.

Dr. Christison said he had more reliance in Dr. Redwood than in Drs. Smith, Apjohn, Quain, and himself.

Dr. Apjohn said, that being the case, he would propose that the Pharmacopœia Committee should cease to exist, and that the preparation of the materials for the new Pharmacopœia should be confided to Dr. Redwood.

The President pointed out that the motion could come on when the Committee was to be reappointed.

The Report of the Pharmacopœia Committee was then adopted by the Council.

Dr. Bennett moved, "That the Pharmacopœia Committee of last year, consisting of Dr. Christison, Dr. Quain, Dr. Sharpey, and Dr. A. Smith, be reappointed."

Dr. Parkes seconded the motion.

Dr. Apjohn moved, as an amendment, "That the Pharmacopœia Committee be not reappointed, but that the task of collecting information preparatory to the publication of the new edition of the Pharmacopœia be entrusted to Dr. Redwood."

The amendment was not seconded. Dr. Bennett's motion was then agreed to.

Parliamentary and Law Proceedings.

HOUSE OF COMMONS.

Metric Weights and Measures Bill.—*July 26th.*—Mr. J. B. Smith, in moving the second reading of this Bill, stated that it was founded on the report of a Select Committee, which had ascertained that there were ten different systems of weights and measures in use in the kingdom, and recommended that all those systems should be abolished and a universal decimal or metrical system introduced. The recommendation was as old as Magna Charta, which declared that only one standard of weight and of measure should be used throughout the country, and now, at the end of 700 years, he asked the House of Commons to recognize the recommendation by a Bill. The necessity for some measure of the kind became painfully obvious at the Exhibition of 1851 and subsequent exhibitions, where manufacturers from different countries exhibited their goods, but could give to strangers no proper idea of their price, in consequence of the diversity of weights and measures. The treaty of commerce with France still further disclosed the inconvenience of the present system, and a committee of that House was accordingly appointed to take the question into consideration. That committee reported that we had 10 different systems of weights and measures, 19 different measures of land, 61 measures for selling wheat, 13 measures for selling oats, 16 measures for selling barley, and 9 for selling butter, and 4 measures for selling flour. In 1864 a Bill was brought in for the establishment of the metrical system; that Bill was opposed by the Government of the day, but they were defeated, and Government promised that if the Bill was turned into a permissive Bill they would take it in hand. But although it was legal to use metric weights and measures, if they were found in a person's possession that person was liable to be prosecuted. Professor De Morgan, in his evidence before the committee, said, "I cannot put in language the advantage to the people of using the same measure." The extreme simplicity of the metric system and the ease with which it was acquired had gradually recommended it to the world, and it was now used compulsorily in France, Belgium, Greece, Spain, Portugal, Porto Rico, Italy, Roumania, Switzerland, Chili, Brazil, Mexico, the Argentine Confederation, Peru, etc., and on the 1st of January next it would come into operation throughout all the States of Germany. There were 200 millions using this system compulsorily and 200 millions more were using it permissively. Of the exports from this country only 25 per cent. were exported to countries using English weights and measures, and 66 per cent. were exported to countries using metric weights and measures. The introduction of the system would have also an important bearing on education, from the ease with which it was acquired. After stating that the Bill had the support of the Chambers of Commerce and various other influential societies throughout the kingdom, Mr. Smith continued, he understood that the Board of Trade would oppose this Bill, and no doubt they would be told that it was a difficult question to deal with, and that its adoption would give rise to serious inconvenience. No doubt there would be very considerable inconvenience. But he must most distinctly say that they did not want a permissive Bill, because in no country could such a change in the law be enforced unless the measure were compulsory. We had for long had an imperial bushel, and yet there were other local bushels used throughout the kingdom. Mr. Cobden, in his last speech upon the subject, spoke strongly in favour of the French system as compared with our own; and his authority ought to be much relied on. What the advocates of this measure asked for was simply that there should be one system of weights and measures throughout the land; and what they looked forward to was the time when there should be one system only of weights and measures throughout the world.

Mr. B. Hope moved that the Bill be read a second time that day six months. He also desired to see one system of weights and measures throughout the land; but it was the English system, and not the French system, that he desired to see adopted. The system which this Bill proposed to introduce would lead to very serious inconveniences. The metric system was good for multiplication, but it failed in division, especially in the natural division of halving and quartering. He was assured on very high authority that in Holland, though the new system had been introduced, the old practice still prevailed. The Standard Commission recommended that the metric system, if adopted, should be permissive and not compulsory; that any Bill to make it permissive should be brought in by the Government, and that it should deal widely with the question as a whole; but the Bill flew in the face of every one of those recommendations. If such a measure became law, it would necessitate the whole country going to school again upon the most elementary ideas of material life; it would throw all leases and engagements into confusion; it would puzzle farmers north, east, south and west with ares, metres, and kilometres, and their decimal parts; it would give dishonest traders increased facilities for cheating their customers, and it would cause infinite misery and inconvenience to all the poorer classes of our fellow-creatures. Sir J. Herschel, in a letter to himself (Mr. B. Hope), in 1868, said,—"As respects a reference of our fundamental units to a natural standard, our national system is anything but the haphazard, indefensible thing it is usually represented to be. The polar axis of the earth is a much better natural unit than the quadrant of a meridian through Paris, and, dividing this into 500 million inches, our actual imperial foot comes within a thousandth part of twelve such inches, or a geometrical foot. I have by me two foot-rules, one by a good optician, the other purchased at a good shop, and none the worse for wear, which differ from each other by more than that quantity. Taking for the definition of our ounce the weight in air of 1-1000th part of such a geometrical cubic foot of distilled water at 62° F. (our standard temperature), according to the rate declared in the 5th Act of George IV., our actual imperial ounce differs from such a geometrical ounce by only 1-7000th part. But if, as some later experiments seem to have shown, that rate is slightly incorrect, then according to these experiments (that is, according to the best of our actual knowledge) the weight of that bulk of water *in vacuo*, at a temperature of 72° in place of 62°, is with absolute precision identical with our actual imperial ounce, also weighed *in vacuo*. As for our measures of capacity, our half-pint is the measure of ten ounces of water."

Mr. Stevenson, in seconding the amendment, pointed out that there was only one pint, one pound, and one yard throughout the whole of the United Kingdom, throughout the United States of America, and wherever the English language was spoken; and they were told that notwithstanding that the metric system had been forced into operation in France by the power of a centralized Government, the foot-rule divided into twelve inches was still of frequent use in the workshops there.

Sir C. Adderley said that the question was whether the disadvantage of getting rid of the old system would more than compensate for the advantages attending the adoption of the new one. He was of opinion that although it might give a new language to commerce, it would be of inestimable advantage to the country to adopt the metric system. It had already been adopted in the colonies, and by Canada in particular, and what could be done by our colonies could certainly be done here. He denied that the metric system had broken down; but even if it had, it did not touch the main question, whether the commerce of England did not demand a simple and intelligible language common to all the nations with whom we traded. Surely, if the commerce of the world demanded a world-wide language, England should not be the country to stand in the way. There were two points chiefly affected, namely, the home trade and the commerce of the world. In this country a stone meant a different weight in respect to almost every different description of article, and a hundred-weight meant 112 lbs., 120 lbs., 128 lbs., and even 140 lbs., in different localities, and according as it was used with respect to different commodities. In his own district, a bushel meant thirty-two different measures. Then with regard to general commerce, was it of no importance to England to use the language of commerce adopted by all the other nations of the world? The French system was as near perfect as any one could be, and it had been generally adopted, though he admitted that a philosopher like Sir J. Herschel objected that the metre was not the best form of unit.

Mr. C. Fortescue said that it was impossible to expect that any legislation could take place on the question this session. The real question was whether there should be a compulsory or permissive measure. In his opinion they had not yet attained that state of things which the Committee contemplated as a condition of legalizing the metric system—namely, the sanction and conviction of the public. The examples of France and of British India would not justify a hasty decision; the evils which formerly existed there having been far more intolerable. It would be the duty of the Government to make some general proposal on that subject next session, including the introduction of the metric system, and the whole of the recommendations of the Royal Commission would be taken into account. Under the circumstances he would put it to the hon. gentleman whether it was desirable to ask the House to commit itself at once to the adoption of the metric system.

Mr. Scourfield said that although the decimal system afforded a good basis for rough division, for minute calculations the duodecimal system was preferable.

Mr. Baynes said the metric system was not, as had been alleged, difficult to learn; if they had a black board there, and the metric system were illustrated upon it, all the opponents in that House would, he believed, at once rise up converts.

Mr. C. S. Read said, as an agriculturist, he felt it was absolutely necessary that there should be a better system of weights and measures, and he believed that on the whole the metric system would be the best. He had sold beef by the cwt., mutton by the lb., and pork by the score. In Shropshire there were not only different weights in different towns, but different weights on different market days in the same town.

Alderman W. Lawrence said he did not think the advantages to be derived from the metric system would counterbalance the expense, trouble, and inconvenience which must arise from such a change. What chance would there be of carrying out the decimal system on the basis of the imperial bushel? Had his hon. friend taken into account the cost to the nation of new weights and measures in every shape throughout the country? Under the metric system the effect of the substitution of the litre for the pint would be that the working man would get 87-100ths of a pint of beer instead of a pint.

Mr. Henley thought that a question of that vast importance ought to be in the hands of the Government. The hon. member for Norfolk said that agriculturists wanted uniform weights and measures. Then why on earth did they not have them? He supposed that like many other men they preferred doing as they pleased. As regarded dealings of masters and labourers under the metric system, it would be almost impossible for the latter not to conceive they were wronged. He believed that the cost of new weights and measures would amount in the first year to a tax of £3,000,000.

Mr. Fothergill thought the difficulties of the metric system among the working classes would be almost insurmountable. He knew thousands of colliers in his own district, and that remark especially applied to them. The introduction of the proposed system of weights and measures would entail upon the employers and manufacturers, very great expense in the purchase of new machinery. He was quite sure that both the working men and the employers of labour on a large scale would strongly object to the introduction of the metric system into this country.

Mr. Pell supported the Bill. The strongest argument urged against the measure was that the introduction of any new system of weights and measures would lead to a vast amount of inconvenience; but already there was a tendency in the country to adopt the decimal system in the measure of land and corn; and he maintained that the balance of convenience was on the side of those who supported, and not upon the side of those who opposed this measure.

Colonel Sykes supported the Bill.

Mr. Illingworth said it seemed to be generally admitted that the metric system possessed great advantages over that at present in use in this country; but it was thought that a compulsory change suddenly made would be productive of considerable inconvenience to the humbler classes. Once let it be known throughout the country that the system would be enacted compulsorily, and would come into force in the course of ten years from the present time, and the school boards would make arrangements for teaching it; and thus in a very short time the minds of the children would become familiarized with the new and improved system.

The House then divided—

For the second reading	77
Against it	82—5

The Bill was therefore rejected, the announcement of the numbers being received with cheers and counter-cheers.

Attempted Suicide by Laudanum.

On Friday, July 21, William Johnson, a pensioned soldier, was charged at Marlborough Street Police Court with attempting to commit suicide. He was found by a policeman lying in Kensington Gardens, with some phials and a bottle by his side, all of which had contained laudanum, purchased at different shops. The prisoner told the magistrate that he had been twenty-one years in the army. He was a German, and could speak French and German, so thinking he might do better, he did not renew his service, but being unsuccessful, he grew despondent and took some laudanum. The magistrate remanded him.

Conviction of a "Medical Botanist."

On Friday, July 14, Charles de Baddeley, herbalist, and Sarah de Baddeley, his wife, were indicted at the Central Criminal Court, for unlawfully supplying a certain noxious drug—namely, ergot of rye—knowing that it was intended to procure abortion.

The evidence in this case has already been reported (Vol. I. p. 1041). It was urged on behalf of the prisoners that no offence had been committed, and some strong observations were made as to the conduct of the police in laying the trap by which they had been caught.

The jury found the prisoners guilty, and they were each sentenced to twelve months' hard labour.

Poisoning by a Soothing Cordial.

An inquest was held at Silkstone Common, on Saturday last, on the body of a child who had been poisoned by a soothing cordial under the circumstances reported last week (p. 77). The jury returned a verdict that the poisoning was accidental.

The Alleged Poisoning Case at Cambridge.

The prisoner in this case is again remanded, Dr. Letheby having reported that he does not find any poison in the portions of the body forwarded to him. A telegram has been sent to Professor Liveing, requesting him to be present at the next examination, to give evidence as to the circumstances under which he detected the presence of arsenic.

VACANCIES AND APPOINTMENTS IN CONNECTION WITH PHARMACY.

The Editor will be glad to receive early notice of any vacancies of pharmaceutical offices connected with public institutions, and likewise of appointments that are made,—in order that they may be published regularly in the Journal.

VACANCIES.

Assistant-Dispensers in charge of Medical Stores at four of her Majesty's Naval Hospitals. Candidates must possess the Major qualification of the Pharmaceutical Society, and be not less than twenty or more than twenty-five years of age. Applications to be addressed to the Director-General of the Medical Department of the Navy, Somerset House, W. C.

APPOINTMENT.

Mr. Robert Rogers, M.P.S., has been appointed Dispenser to the Plymouth Public Dispensary, in the room of Mr. W. J. Dicker, who held the office for thirty-three years.

Correspondence.

**** No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

The Pharmacy Bill.

Sir,—Until the last number of the Pharmaceutical Journal appeared I had allowed myself to hope that, upon the abstract question of legislative interference with the internal arrangements of our shops, all chemists were of one mind. I thought that one and all alike deprecated such legislation, believing each individual member of their fraternity to be competent to frame all requisite precautions for the safety of the public and the security of his own means of living, without the intervention of any law upon the matter. I imagined the difference of opinion which existed amongst us to consist mainly in this—that whereas *some* thought that an opposite opinion being held by the public and the Privy Council, and the power of the latter being irresistible, it behoved us to yield the principle, and to accept the best terms we could get; *others*, on the contrary, considered that the public was simply misinformed, that the contemplated intrusion of the Privy Council was capable of being resisted, and that the principle of business independence was worth fighting for.

In ranging myself, therefore, with those who proceeded to resist the action of the Privy Council, I believed, not only that I was helping to do battle for the honour of the whole trade, but that if we in any way succeeded in our object the whole trade would rejoice.

To a very considerable extent we did succeed, for the Bill was withdrawn "with the general approval of the House," and there is every probability that, had the whole trade been united in principle (as I had thought was the case), it would have died the death it deserved. At any rate it was withdrawn, and I looked for a general expression of content. But the last Journal contained a letter and a document singularly the reverse of what I had hoped to see.

In the first place, I am thereby proved to have been quite wrong in supposing we had the secret sympathy of our professed opponents, for we now find that all the efforts we were making to enlighten our parliamentary representatives, and to persuade them to treat us with some respect, were at the same moment being thwarted by a circular, signed by some of the best-known names in the trade, which kissed the hands of the framers of the Bill, and begged hon. members to pass it into law. This was no very pleasant discovery; but the revelation displays something more—for the publication of this circular, with the names appended, *a week after the withdrawal of the Bill*, leads to the almost necessary inference that these gentlemen intend for the future openly to advocate the very principle against which we have been struggling. They no longer affect to be trying to make the best of a bad job, but they join issue with us on the principle itself, and assert that the job is a good job; to quote their own words, "they presume to point out how completely the objections to the Bill have been removed (by the amendments) and trust hon. members will support it accordingly."

I am grieved beyond measure at the course taken by Mr. Sandford and his friends (I am taking for granted that he had their consent to publish the document as he has done), inasmuch as the elevation of such a standard within the ranks of our own body cannot but be regarded by many of us as sheer treason, and must create a ground of division emphatic in proportion to the emotions such a word is likely to arouse.

G. F. Schacht.

Clifton, July 24th, 1871.

Sir,—I take leave to recommend your correspondents not to fan the expiring embers of the poison regulations; leave them alone and depend upon it these will soon go out. Weigh the pretensions of Dr. Simon in the scale with the powerful influence which the chemists throughout the land have commanded in Parliament, by reason of the fairness and justice of their cause, and those pretensions will be found as dust in the balance. The few who feel they cannot conduct their business with security to themselves and safety to the public without being bound in a Parliamentary strait-jacket, I earnestly urge at once to consult Dr. Munro.

Kilburn, July 24th. John Beaton.

Sir,—You properly deprecate a continuance of the recent conflict of opinion on the Pharmacy Bill, and every true friend of the Society will re-echo your sentiments; you speak, however, with bated breath, feeling, probably, that the circular of Mr. Sandford would be promptly repudiated. As President of the Hull Chemists' Association, it is within my knowledge that the circular has caused a strong feeling of dissatisfaction,—the general impression here being that any man who could deliberately append his name to such a document, understands very little of the principles for which we in the provinces so determinately struggled. In my judgment the parts of the Bill eliminated were as small dust in the balance, compared with the real and weighty grievances which remained. The opening sentence of this strange circular states, that "in 1868 the Society had to resist as strongly as possible the introduction of restrictive clauses, which would have seriously fettered chemists in their daily avocations;" and it winds up with the following, in italics:—"We have presumed to point out to you how completely the objections to the Bill have been removed, and trust you will support it accordingly." Who could suppose that the Bill, of which the signatories speak so complacently and which they are so anxious to embrace, is still partial in its operation—omitting surgeons, hospitals, dispensaries, etc.—and contains compulsory, penal and disqualifying clauses; surely the force of inconsistency can no further go! We shall continue to struggle against harsh and uncalled-for legislation, whether Parliamentary or Pharmaceutical, and I am satisfied we shall have not only the trade, but the public with us. I will only add that the effect of the circular in Hull has been to determine us to organize an association, including East and North Yorkshire and North Lincolnshire, the object of which will be, "the protection of the public against the risk arising from compulsory fancy regulations and the defence of the trade against penal and restrictive enactments, until at least a *primâ facie* case for legislation has been established."

Upon those, who by their acts are provoking the renewal of a fruitless contest, must rest the responsibility for the misapplied time, energy and money which might otherwise have been devoted to Pharmaceutical education.

Hull, July 25th, 1871. James Baynes.

Sir,—The success of the opposition to the passing of the late Pharmacy Bill is not likely to leave in a captious mood those who have so much reason to be satisfied at its withdrawal.

At the same time, they will not affect to underrate the importance of the Circular, bearing the signatures of a number of chemists, which you published last week. As Mr. Sandford writes you that he was the recipient of the signatures given to this circular, there can be no impropriety in treating its construction and mode of issue as being Mr. Sandford's. The other gentlemen attaching their names have, of course, become responsible for the document; but it is evident that the motives influencing them individually must have been widely various.

To place such a document in the hands of members of Parliament upon the day of the second reading was, doubtless, considered a clever piece of strategy, since the circular dishonestly (I speak advisedly) assumes that its promoters were persons who recognized the faults of the original Bill, and who stated the pith of their document in the following words,—"to point out to you how completely the objections to the Bill have been removed." What are we think of persons who could use such language, when their every previous public word and act had been to defend the original Bill as having no faults? However, the treacherous arrow missed its mark by the withdrawal of the Bill, and it now affixes to public gaze many names which chemists throughout the kingdom see there with sorrow.

The plain fact is, that Mr. Sandford has set up a new Cave of Adullam. The promised prospect of a settlement of a vexatious question brought most of its occupants, and from a mass of indifferentism he has had considerable success. The dramatic effect of using the names of firms as signatories was also cleverly planned; but as regards certain "historic houses," those having the legal right to the names of some who were defenders of the liberties of chemists, appear to have little regard for the principles held by their predecessors.

We now ask, Why did Mr. Sandford gather together the names of 120 chemists to offer their opinions? Were they representatives of their brethren, or authorized to speak for them? Certainly not. The feeling of the country had been expressed in every possible way, through votes of annual meetings, of the Council, through a deputation to the Vice-President of the Privy Council, through three Defence Associations, through trade meetings in a dozen of the chief towns, and through petitions signed with unprecedented unanimity. Since one alone of the Defence Associations numbers more than 500 members, it does not seem very likely that Mr. Sandford's new party can successfully compete in the representation of popular feeling.

The late circular will not fail to have one result,—in consolidating and making permanent the various Defence Associations. It is a direct challenge from Mr. Sandford on behalf of personal government to that system of representative government by which the Pharmaceutical Society is regulated. Such a contest will draw sharp lines, and those who have wished to trim their sails to every wind will fall out of the race. Submission to what has practically been personal government has already cost our body dearly in the late expenditure of time, energy, and money, which has been a consequence of Mr. Sandford's want of knowledge of his brethren in 1868. The alliance between Mr. Sandford and his constituency stands on a strange footing, when he puts aside its most plainly expressed will, as soon as it differs from his own, and seeks by most questionable means, and equally questionable allies, to enforce his wishes.

It is to be noted that the consideration already given to the subject by many members of the House of Commons has had most satisfactory results. So acute a reasoner as Mr. W. M. Torrens, M.P., accepts the question as involving most important constitutional rights, and is determined in this favourable position to withstand the dangerous encroachments of bureaucracy. The Bill is spoken of as being "the most unpopular of any since the present Parliament was called."

Legal M.P.'s rapidly perceive the fallacies which have been woven to cover the natural repulsiveness of the measure. "Very sharp practice" was the verdict of one as to the pretended contract made in 1868; whilst another sententiously disposed of the whole question by the remark, "Another piece of over-legislation."

Those who appealed to members of the House of Commons are not likely to stultify themselves by letting future judgment of the question go by default. They have received from the Right Hon. W. E. Forster and the Government concessions which the Medical Officer of the Privy Council and Mr. Sandford had refused them; and in the giving up of the absurd "poison bottle" they have a reward that repays many labours.

But, if another attempt should be made to pass a similar Bill (it ought to be intituled "A Bill to save the feelings of two men at the expense of ten thousand"), those who opposed the Bill of 1871 will once more—not "with light hearts," but with undaunted ones—appeal, and not in vain, to that greatest of representative bodies, the British House of Commons.

Leeds, July 25th, 1871. RICHARD REYNOLDS.

Sir,—In "a letter addressed to members of Parliament" we have a forcible illustration of how consistency, at one time a virtue, may degenerate into vice. In 1868, when the Society delighted to honour an individual member of the Council, it was in consequence of his strong resistance to restrictions being introduced into the Pharmacy Act, which would have seriously fettered chemists in their daily avocations. It was also from implicit confidence in his representative capacity that he was permitted to act almost absolutely with the Government and the officials of the Privy Council, and to arrange that tacit understanding which was the means of passing the Bill, but of which the Society knew nothing.

Consistency has since compelled him to enforce the part he had guaranteed the Society should perform. Consistency caused him to resign his exalted position, rather than surrender the views he entertained as imperative on the part of the Society to carry out, and for this personal sacrifice he was extolled, and general approbation given for his conscientious observance of that which to him was a point of honour and a duty.

Up to that period few there were who denied that his consistency was a virtue, but since then the scene has entirely changed. Still bearing the esteem of his fellows as a gentleman and a man of courage and honourable convictions, he was no longer deputed to act as the exponent of the trade's desires, but became voluntarily its antagonist. By the result of the elections he was no longer compelled to enforce the principles as a private individual that he had undertaken as the representative head of an approving Council. By the elections it was proved that he did not represent the true feeling of the trade; and although his letter addressed to members of Parliament bears the signatures of many esteemed names and firms of good pharmaceutical standing, they simply show a sympathy for the writer of the letter, rather than of the sentiments it contains, inasmuch as the majority had already pledged themselves to the opposite side, and signed petitions against any interference whatever. The inference intended to be impressed upon members of Parliament was scarcely as fair as could be desired, inasmuch as there are represented 65 towns, containing 783 members, and out of that number 715 had protested against the Bill, and signed petitions in opposition to it. And yet, by obtaining the signatures of 56 local secretaries of the Society, the feeling of the majority is ignored, and a false impression conveyed. It is quite clear that these local secretaries have been caught napping, or else they acknowledge themselves the officials of Mr. Sandford, and not of the members of their locality or the Society they are elected to represent. In glancing over the London signatures, names of those may be observed who formerly declared education to be the only safeguard, and who protested against any check that did not emanate from the brain. Are the commanding premises in Bloomsbury to be put up to auction in consequence of our educational system having proved ineffective as regards the training of pharmacists, or the consequent safety of the public? Or is it considered a sufficient compensation to these gentlemen that every surgeon and others keeping open shop should be marked incapable of arranging their own bottles?

The question has lost its broad character and become a personal matter. In 1868 certain conditions were advanced to which the trade was not a consenting party, and which it has since unequivocally condemned; and yet notwithstanding five-sixths of the trade had declared its distinct opposition, for personal considerations we were called upon to fetter ourselves and assist in like manner to manacle the members of a learned profession.

It cannot be denied that those who are aiding the Privy Council to subject us to its control, are but an insignificant minority, as far as numbers tell. They cannot deny that in exercising their own judgment, they are forcing upon others restrictions repugnant to them and totally uncalled for, and are exhibiting more the spirit of pique than a desire to serve the trade. They are enabling those who made promises to the Government to retaliate in consequence of the disappointment that has fallen upon them by the rejection of their leadership. Is it not sufficient for those who are enamoured of the regulations to adopt them, without compelling others who have arrangements of their own, which they consider better and more appropriate?

If the shelving of the Bill this year is but the prelude to its reproduction next Session, it is to be hoped that a better spirit will prevail, and that those who have gone beyond the bounds of consistency to fetter the trade, will respect the decision of the majority and put aside all personal feeling and obligations other than those which belong to them as members of the chemist and druggist fraternity.

July 25th, 1871. JOHN WADE.

Sir,—The array of influential names appended to a circular, asking members of Parliament to support a Bill to authorize the inspection of pharmacies, with the consequent power of summoning before magistrates and inflicting fines, suggests the question,—when will chemists realize their improved and improving position, and indulge in a little justifiable self-respect?

It is probable nine-tenths of the chemists on the register would willingly adopt the simple regulations recommended by the Council; and there can be no doubt that not one-tenth would willingly submit to the degradation of compulsory inspection. I would suggest a counter-representation to the members of the House of Commons, stating that the subscribers thereto, although willing, and thereby pledging themselves, to adopt the "recommendations," protest, in the strongest possible manner, against their voluntary and successful efforts to make themselves worthy of public confidence being dishonoured and suspected.

Chemists, by much labour and self-sacrifice, have placed themselves above the condition which could alone justify inspection. Why should Parliament be asked to deal with them as if they had done nothing, and to treat their self-elevation as a punishable offence?

Glastonbury, July 25th, 1871. T. MAYHEW.

Sir,—I am not a little surprised at the manifesto you publish from the pro-regulationists. I confess I feel somewhat at a loss to account both for its existence and for its appearance after the withdrawal of the Bill. That the minority should seek by a movement in ambush to get an advantage over the majority, is an act not so graceful as we should have expected from the great names connected with it.

The inherent errors and evident want of consideration observable in the circular, mark it as one of the mistakes so often committed in haste to be repented of at leisure.

But why is it published? A mistake of that kind should be only grieved over and forgotten. Then why is it published? Can it be an open declaration of war? If so, it would appear that the right hand of the pro-regulationists has forgotten its cunning. But whatever be the character of the proceeding, it is evident that we must keep in working order the organization which was necessitated by the indifference previously shown by a majority of the Council to the opinions of a majority of the Society.

It may be that a reform in the government, if not a revolution in the constitution of our Society, will spring from the continued disposition of a section (an influential section, I am willing to admit) of metropolitan pharmacists to oppose the general body of the trade upon political questions.

BARNARD PROCTOR.

Grey Street, Newcastle, July 26th, 1871.

Sir,—May I beg the favour of your inserting the following correspondence in the next number of your Journal?

171, *High Holborn*, JOHN CARR.
July 22nd, 1871.

63, *Piccadilly, Manchester*,
July 21st, 1871.

Sir,—I think it is fair to you, as well as just to the Association I represent, to inform you that I have been repeatedly questioned, and an explanation has been frequently sought from me, to account for the strange inconsistency in your voting since your election to the Pharmaceutical Council.

In your letter of the 14th of March you consent to be nominated as a candidate by the "Chemists' Defence Association;" you likewise approve of its object, and offer to subscribe to its funds. In consequence of this agreement of opinion, you were nominated, and your election to the Pharmaceutical Council was duly secured. Notwithstanding this honourable and definite arrangement, you have on every occasion recorded your vote in favour of compulsory poison regulations, and against the Society taking any part in preventing the 'Amended Pharmacy Bill' becoming law.

If you have changed your views, and are now convinced that compulsory poison regulations are necessary, it is only equitable that you should resign your seat, as you were returned to the Council for the specific purpose of opposing such unjust and unnecessary restrictions.

Please to consider this correspondence as subject to publication. Awaiting your reply,

I am, Sir, your obedient servant,
ROBERT HAMPSON, *Hon. Sec.*

JOHN CARR, Esq.

(REPLY.)

171, *High Holborn, London*,
July 22nd, 1871.

Sir,—In reply to your letter of the 21st instant, I beg to decline any explanation of my votes at the Council-table of the Pharmaceutical Society. I sit at that board to exercise and act according to my judgment and the best interests of the Society.

You say I must consider our correspondence as subject to publication, and I have therefore no hesitation in informing you that I shall myself publish it in the next issue of the PHARMACEUTICAL JOURNAL.

I remain, Sir, yours truly,
JOHN CARR.

To R. HAMPSON, Esq.

In addition to the foregoing correspondence, the following has been forwarded to us by Mr. Hampson:—

63, *Piccadilly, Manchester, July 24th*, 1871.

Sir,—Your reply of July 22nd is duly to hand. I certainly expected some explanation to account for the breaking of the pledge given in your letter accepting the nomination, but I will not lengthen this correspondence by any further comment. I am content to leave the facts as revealed in these letters to the verdict of honourable men.

I am, Sir, your obedient servant,
ROBERT HAMPSON, *Hon. Sec.*

P.S. I have, this morning, sent the whole of the correspondence for publication in the next issue of the PHARM. JOURN.

London, 171, *High Holborn, March 14th*, 1871.

Sir,—In reply to your letter, I beg to say I shall have no objection to be nominated as a candidate at the next election of members for the Pharmaceutical Council, by the Defence Association. I entirely agree with them in resisting the unjust and unnecessary restrictions the majority of the Council are anxious to place upon us, and should have joined you, but, as a member of Council, think it better to be quiet for the present; at all events, if it is requisite, I shall be happy to subscribe to the objects of the Society.

I may mention I have nominated Mr. E. Smith, of Torquay; he is an intelligent person, and would make a most useful member of Council; he has promised to serve, if elected, and is totally opposed to the majority of the Council on this matter; he has taken great interest in the question, and has published one or two papers on the Storage of Poisons in the Journal.

I remain, dear Sir, yours truly,
JOHN CARR.

ROBERT HAMPSON,
Hon. Sec. to the Chemists' Defence Association.

Sir,—May I request the favour of your inserting the enclosed correspondence in the forthcoming number of the Journal?

Perhaps I may be allowed to state that I have not previously had any correspondence, either directly or indirectly, with the Chemists' Defence Association.

July 25th, 1871. EDWARD SMITH.

(COPY.)

The Chemists' Defence Association,
63, *Piccadilly, Manchester, July 21st*, 1871.

Sir,—The members of the "Chemists' Defence Association," and those generally who have opposed the enactment of further compulsory poison regulations, have expressed much surprise, and some indignation, at the support you have given to the members on the Pharmaceutical Council who are in favour of further legislative enactments of a restrictive character.

The following is a quotation from a letter received by me from Mr. Carr, dated March 14, 1871:—

"I may mention I have nominated Mr. E. Smith, of Torquay; he has promised to serve if elected, and is wholly opposed to the majority of the Council on this matter; he has taken great interest in the question, and has published one or two papers on the storage of poisons in the Journal."

In consequence of this definite guarantee of Mr. Carr's, your name was with perfect confidence included in the list of candidates put forward by the Chemists' Defence Association, and without a doubt your election was secured thereby.

As I presume that you have changed your views on the question at issue, I do not see how you can consistently, or in common fairness, continue to occupy your seat at the Council, knowing as you do, that you were returned to support views directly opposed to those you now entertain.

Please to consider this correspondence subject to publication. Awaiting your reply,

I am, Sir, your obedient servant,
E. SMITH, Esq. ROBERT HAMPSON, *Hon. Sec.*

(COPY.)

Torquay, July 22nd, 1871.

Sir,—I have to acknowledge the receipt of your communication of yesterday's date, somewhat imperiously, on behalf of your Association, calling upon me to resign my seat at the

Council of the Pharmaceutical Society, and further erroneously attributing to me a change of opinion respecting the Poison Regulations.

As I am not a delegate of your Association, nor in any way connected therewith, I shall not enter into any correspondence respecting the matters referred to in your note, but must content myself now by distinctly repudiating the authority your Association presumes thus to assume over members of the Council of the Pharmaceutical Society.

I am quite ready and most willing at any time to reply to any gentleman, who courteously communicates with me, on the subjects referred to in your note.

Yours,

R. Hampson, Esq. Edward Smith.
Hon. Sec. Defence Association.

The Council of the North British Branch of the Pharmaceutical Society and the Pharmacy Bill.

Sir,—In the hope that the question of poison regulations and the late Pharmacy Bill have sunk into oblivion to rise no more, and being desirous that differences of opinion upon them should now be cemented, especially at the prospect of a pleasant "Conference" meeting in Edinburgh next week,—I would have preferred to let the matter rest in peace, but I consider that a word of explanation is necessary regarding the report of a meeting of the Council of the North British Branch of the Pharmaceutical Society published in last Saturday's Journal.*

The high-sounding title, "The Council of the North British Branch of the Pharmaceutical Society," will, doubtless, be looked upon by our friends south of the Tweed, as a representation of the members of the Society in Scotland, and, consequently, that the decision of that body on the Amended Pharmacy Bill will be representative of their opinions. I have reason to know, and I believe I am quite justified in stating, that the present Council is not a *fair* representation of the North British members of the Pharmaceutical Society. Their decision, therefore, cannot in any case be accepted as expressive of the feelings of the members the Society in Scotland. This, of course, opens up the question, "How is this Council elected and the Society conducted?" I trust it will be discussed on some future occasion; meantime I will content myself by stating that I have refrained from sending reports to the Journal of the action taken by the "West of Scotland Chemists' Defence Association" against this Bill in all its forms, as I consider the columns of the Journal of late have been occupied more than was necessary with this uncalled-for poison question, and much to the detriment of matters of greater importance to the Society, which I look upon as purely an educational institution.

James M. Fairlie.
St. George's Cross, Glasgow, July 25th.

Informal Petitions.

Sir,—That numerous petitions have been rejected on the ground of informality, is apparent by reference to the enclosed printed form:—

(Copy.)

House of Commons.

Journal Office.

Sir,—With reference to the accompanying Petition, I have to call your attention to the Standing Order of the House, which requires that every Petition must contain a Prayer.

There is no Prayer to the sheet upon which this Petition is written; it is, therefore, informal, and will not be submitted to the Select Committee on Public Petitions.

The words, "Your Petitioners will ever pray, etc.," have no reference to the subject-matter of the Petition.

I have the honour to be, Sir,
Your obedient servant,
Wm. Glynn.
Petition Department, Journal Office, House of Commons.

Now, although our petition was read over at least a hundred times during the day and a half we had for obtaining signatures,—was approved by our solicitor, and by our member of Parliament, no one detected the omission of the few words that constitute its ineligibility.

The comment of Mr. Peek is, however, noteworthy, who in returning the petition, says,—

"The Bill having been withdrawn is a matter of no consequence, but another time the necessary formality must not be forgotten." Allow me, Sir, to add, in conclusion, my humble opinion that the most effective and constitutional way of moving any Government, is the expression of public opinion, thus saving a vast amount of circumlocution, writing, printing, interviewing, deputation and expense of postage, travelling, etc.; above all, of brain-power that might have been more profitably directed.

R. Goodwin Mumbray.
Richmond Hill, July 26th, 1871.

Poisoning with Beans at Liverpool.

Sir,—I enclose three "beans," apparently of different species, the names of which I cannot at present learn. Perhaps you can identify them, and kindly let me know the result through the Journal. I obtained these from Mr. Smith, of Athol Street, the gentleman to whose shop the sufferers from Calabar bean poisoning were taken the other day. I was there told that beans similar to the sample were along with the Calabar-beans, and were as freely partaken of as the others. I am also inclined to think that castor-oil beans were present, as I became acquainted, about the same time, with a case of serious illness, caused by a woman having eaten freely of them, a sample of which was shown to me by her husband. These were picked up by several people about the same locality, and no doubt have caused great uneasiness, and possibly severe illness, as, according to my informant, they were eaten largely, in some cases by the handful. After reading such a case as this, the question naturally forces itself upon our attention, How is it that so poisonous a drug as Calabar bean is allowed to be throwing about our dock quays and waste places, apart from all consideration of its value as an article of commerce, for I find from the drug list its price to be 4*s.* per lb.? The difficulties of examining every cartload of rubbish going through the dock gates are, of course, great. I think something might be done to mitigate the evil by the dock board and the corporation,—the former by impressing on its officials the necessity of looking after the rubbish cleared from the holds of the west coast of Africa traders, for I believe the mischief is confined entirely to them, and the latter by prohibiting its deposit within the borough boundary.

9, *West Derby Street, Liverpool, July 18th,* 1871. T. H. Hustwick.

[*** The seeds sent are those of the oil palm of Africa (*Elæis Guineensis*), from which palm oil is obtained. The fatty oil is used largely on the West Coast of Africa for the same purposes as butter in this country.—Ed. Pharm. Journ.]

The "Bank Holidays."

Sir,—Messrs. Maw, Son, and Thompson have inserted a "Notice to the Trade," in their Price Catalogue, intimating that their establishment would be closed on the following days:—Good Friday, Easter Monday, Whit Monday, first Monday in August, Christmas Day, and Boxing Day. Is not this an example worthy of imitation by the wholesale trade generally? Not only will the banks be closed on these days, but many wholesale houses in various branches of commerce have determined to follow the same course. Why should the drug trade be an exception? If the plan were universally carried out, employers would suffer no pecuniary sacrifice; retailers would be put to no inconvenience, as they would be able to make provision beforehand, and those engaged in the wholesale would derive a great benefit.

M. P. S.
London, July 25th, 1871.

P.S. I do not see why the plan might not be largely adopted in the retail also.

Communications, Letters, etc., have been received from Mr. E. H. Chester, Mr. W. W. Stoddart, Mr. W. M. Betts, Mr. J. R. Jackson, Dr. Headland, Mr. J. H. Woods, Mr. J. Thornton, Mr. Tomlin, Mr. Horsley, Mr. Owen Jones, Mr. W. L. Yeats, Mr. Atkinson Pickering, N. O. P., M. P. S., W. G., "Veuve."

* See *ante*, page 67.

VESICATING INSECTS.

BY M. C. COOKE, M.A.

In order to enumerate and give some brief particulars of all the known vesicating insects that are or have been employed in medicine, it will be well to divide them into three groups, *i. e.* the Mylabridæ, the Cantharidæ, and the Meloëidæ. There will then remain only a miscellaneous few which cannot be included in any of the three groups, containing such insects as are known to have been employed as substitutes or adulterations. This classification is conformable to that adopted by entomologists, and will not therefore be open to the objection which may sometimes be urged against artificial arrangements for economic purposes.

Section I. Mylabridæ.

The number of species included by Gemminger and Herold ('Catalogus Coleopterorum') in the genus *Mylabris* is formidable, as compared with those described by Billberg in his monograph, published in 1813. Only a small proportion of these have any reputation as vesicants, but it is very probable that the majority of them are more or less possessed of vesicatory properties. It is to be regretted that an elaborate monograph by Marseul, read before the Entomological Society of France twelve months since, has not been published, but there have probably been excellent reasons why it has not appeared. War is no friend to science.

Chicory Mylabris or Telini Fly, *Mylabris cichorei*, Fabr.; villous, black; elytra black, with two spots, and two ochraceous bands.—Fabr. S. El. ii. p. 81; Oliv. 47, p. 7. t. 1. f. 1; *Meloë cichorei*, Linn. Syst. p. 680; Panz. Ins. 31. t. 18; Steph. Med. Zool. t. 26. f. 5; Billb. Mon. t. 1. f. 8, 9; De Geer's Insecta, iv. t. 13. f. 2; Pallas, Ins. Ross, t. E. f. 7; Moq.-Tand. Med. Zool. f. 32; Brandt and Ratzb. ii. t. 18. f. 17.

This species is the best known, and, according to Moquin-Tandon, is employed in Italy, Greece, Egypt, etc., as far as China. It is found in several of the warm parts of Europe, as well as in Asia, and resides on the flowers of the wild chicory, and other composite plants in Europe, and various plants in Asia. Attention was directed to this insect, as a native of India by Captain Hardwicke, in 1799. The following is his detailed description:* Antennæ moniliform, short, consisting of eleven articulations, increasing in size from the second to the apex; the first nearly as long as the last; each a little thicker upwards than at the base, and truncated, or as if cut off, the last excepted, which is egg-form. Palpi 4, inequalled, clubbed, the posterior pair of three, and the anterior of two articulations. Maxillæ or jaws four, the exterior horny, slightly curved inwards, 3-toothed, the two inferior teeth very small; the exterior pair compressed and brush-like. Head gibbous; eyes prominent, large, reticulated; labium or upper lip hard, emarginated. Thorax convex above, broader towards the abdomen, and encompassed by a narrow marginal line. Elytra crustaceous, the length of the abdomen, except in flies pregnant with eggs, when they are shorter by one ring; convex above, concave beneath; yellow, with three transverse, black, irregular undulated bands, the one at the apex broadest, and that at the base dividing the yellow longitudinally into two spots; porcated or ridged; the ridges longitudinal and parallel to the suture; in number, three equal, one unequal, the ridges not very prominent. Alæ or wings membraneous, a little exceeding the elytra in length, and the ends folded under. The tarsi of the two first pairs of feet consists of five articulations; and of the posterior pair four only. Every part of the insect excepting the wings and elytra is black, oily to the touch, and covered more or less with dense hairs; a few scattered hairs are also evident on the elytra. All the crustaceous parts of the insect are pitted minutely. It is about the bigness of the *Meloë proscarabæus* of Linn., and a full-grown one, when dry and fit for use, is to the *vesicatorius* in weight as four and a half to one.

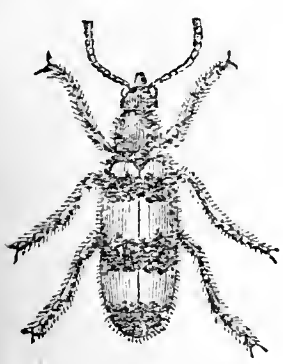


Fig. 1.

"They come into season with the periodical rains, and are found from the month of July to the end of October, feeding on the flowers of Cucurbitaceous plants, but more frequently on the species of *Cucumis* called by the natives "Turiey," with a cylindrical smooth, 10-angled fruit. Also on the "Raam-turiey," or *Hibiscus esculentus, Hibiscus Rosa-sinensis*; and in jungles where these plants are not to be found, they are to be met with on two or more species of *Sida*, which flourish in that season. In the failure of flowers, they will feed on the leaves of all these plants, except the "Turiey," which I have not observed them eat. They are great devourers, and will feed as freely in confinement as at large. In September they are full of eggs, which seems to be the best state in which they can be taken for medical use, at that time abounding more abundantly in an acrid yellow oil, in which, probably, resides their most active property. This fluid seems the animal's means of rendering itself obnoxious to others; for, on the moment of applying the hand to seize it, it ejects a large globule from the knee-joint of every leg, and this, if suffered to dry on the fingers, soon produces an uncommon tingling in the part, and sometimes a blister. This is the only inconvenience attending the catching of them, for they make no resistance; on the contrary, they draw in the head towards the breast as soon as touched, and endeavour to throw themselves off the plant they are found on. The female produces about 150 eggs, a little smaller than a caraway seed, white and oblong-oval. Their flight from plant to plant is slow, heavy, and with a loud humming noise, the body hanging almost perpendicularly to the wings. They vary in the colour of the elytra, from an orange-red to a bright yellow; but I do not find this variety constitutes any difference in sex. The natives of this part of the country know the insects by the name of "Tel-eene," expressive of its oily nature. It is stated by Captain Hardwicke to be found in all parts of Bengal, Behar and Oude.

In India this insect is known as the Telini fly, and the following synonyms have been traced by Mr. Moodeen Sheriff,—Zararihul-hind, or Zararihe-hindi of the Arabs; Dabane-hindi of the Persians; Telni, or Telni-makkhi of the Hindus; Bad-bo-ki-zirangi, or Zirangi of the Deccan; Pinsttarini of the Tamuls; and Blishtering-igelu of the Telugus. These names are probably applied to other species as well as the present, employed for like purposes.

There is an apparent discrepancy between the

* 'Asiatic Researches,' vol. v. 1799, pp. 213–215.

different descriptions which have been given of this fly, occasioned by the fact that some have regarded the ground colour of the elytra as black, with ochraceous yellow bands and spots; others treat the ochraceous yellow as the ground colour, with three black bands. O'Shaughnessy states that the Telini fly is common in the neighbourhood of Dacca, in the Hydrabad country and numerous other localities. If procured before the mites have commenced its destruction, it yields, on an average, one-third more of cantharidin than the Spanish fly of the European shops. "Some prejudice," he says, "exists against the article on account of its alleged excessive severity of action. This is solely owing to the presence of a greater quantity of cantharidin than that contained in the common fly. Diluting the tincture, and adding to the proportion of lard and wax in the plaster and ointment, perfectly assimilate the action of the indigenous and the imported insects."

Dr. Bidie* seems to doubt whether the insect found in the Mysore country was the same as Captain Hardwicke's, as will be seen by his remarks: "There is a species of *Mylabris*, very similar to Hardwicke's, found in abundance in the Mysore country, of which the following are the characters:—head gibbous; eyes large, prominent, antennæ with 11 joints, gradually ending in a club, and eleventh joint large and ovoid; thorax convex above, broader towards the abdomen, somewhat hairy; elytra crustaceous about the length of the abdomen, convex above, concave below, yellow, with three transverse, black, irregular, and undulating bands, that at the base dividing the yellow into two spots; wings thin, brownish, membranaceous, longer than the elytra, tips folded under; first 2 pairs of tarsi 5 joints each, last pair 4 only, last joint in all furnished with pair of claws. When touched, the insect ejects from the joints of its legs large drops of a yellow oily fluid of an acrid nature. They are very destructive to all the species of *Hibiscus*, to Roses, etc. When gathered they should be killed by being plunged into vinegar, and then dried in the sun. The month of September is said to be the best time for collecting them, and they should be stored in close-stoppered bottles, with a little camphor to preserve them from the attacks of insects." There is no good ground for supposing that there is any difference between the Mysore and Bengal insect. In the absence of specimens it is not easy to appreciate the doubts of local entomologists on closely allied forms. In both instances it seems that *M. cichorei* and *M. phalerata* are confounded together, the latter being specially fond of such Malvaceous plants as the species of *Sida* and *Hibiscus*.

Dr. Fleming says that this insect abounds in every part of Bengal, Bahar and Oude. In the rainy season, during which it is in its most perfect state, it is found feeding on the flowers of the various species of *Hibiscus* and *Sida*, and is readily distinguished by the three transverse, undulated black bands on its yellow elytra, which constitute its specific character. The flies should be gathered in the morning or evening, and immediately killed by exposing them to the steam of boiling vinegar. They should then be thoroughly dried by the heat of the sun, and afterwards put into bottles to preserve them from humidity.

(*To be continued.*)

* Bidie in Madras Quart. Journ. Med. Sc. vol. v. p. 261, 1862.

EUCALYPTUS GUM.

BY PROFESSOR T. WIESNER.

The Austrian Pharmaceutical Society requested Professor Wiesner, of Vienna, to subject their collection of samples of Eucalyptus gum to an investigation, which he did the more readily as no reliable information on the subject existed.

The collection contained twenty different samples, some with the flowers and leaves of the plants. It had been received from Dr. Sonder, of Hamburg, and came from Dr. Ferd. Mueller, Director of the Botanical Gardens at Melbourne, to whom we are much indebted for our knowledge of the Australian flora.

The apparent similarity of this gum-resin to gum-kino, the dried juice of the bark of *Pterocarpus Marsupium*, Mart., has led to the conclusion that it is a species of kino, like the extract of the wood of *Coccoloba uvifera*, L., Jamaican kino, or the gummy substance from the bark of *Butea frondosa*, Roxb., Bengal kino.

But well-known authorities in pharmacognosy have been inclined to doubt the kino-like character, and to look upon it as merely a gum-resin impregnated with colouring matter. It therefore became necessary, above all, to determine the constituents of the Eucalyptus gum; and the author finds the principal part of all samples to be nothing but so-called kino tannic acid. He obtained by Berzelius's method a red, amorphous substance identical in all its reaction with kino tannic acid.

The gum was dissolved in water, and the flocculent, pale-red precipitate, obtained by adding sulphuric acid, was washed until acid reaction of the wash-water ceased; the precipitate was dissolved in boiling water, and separated after cooling from the insoluble matter. The red liquid was evaporated *in vacuo*, and yielded thin, red, transparent laminæ, which under the microscope appeared cracked and quite amorphous. The mass is slowly soluble in cold, but readily in hot water; the solution is adstringent. Alcohol, like hot water, gives a ruby-coloured solution; perchloride of iron produces a dirty green precipitate. The kino tannic acid obtained from kino itself gave with the iron salt a black-violet precipitate; but as the author is far from looking upon this acid as a definite chemical compound, he thinks he has proved the identity of the principal constituent of the gum under examination with kino. He adopts the name Eucalyptus kino, and he avoids the expression gum, because gums are mostly soluble in alcohol as well as in water. In Bentham and F. Mueller's 'Flora Australiensis,' the many extracts obtained from *Eucalyptus* are always called gums; and in vol. viii. p. 185, it is even stated that the *Eucalyptus* species yielded gum-resins, and therefore they were named gum-trees.

Pterocarpus kino contained, besides kino tannic acid, water, mineral substances with 1·3 per cent. of ash, a substance similar to pectine, catechine and a little pyro-catechine, but no sugar. Eucalyptus kino contained from 15 to 17 per cent. of water; it gave only a trace of ash, and no sugar was found. Several samples contained a little catechine. Pyrocatechine appears always to be present. A pectine-like substance could not be detected in any of the samples, but several samples contained a substance soluble in water, similar to gum arabic. The juices of *Eucalyptus gigantea*, Hooker, contained this substance in such quantity that several lumps were quite insoluble in alcohol.

The physical properties of Eucalyptus kino nearly agree with those of ordinary kino; it forms dark red, more or less transparent grains; in thin fragments, under the microscope, quite transparent and amorphous. They sink in cold water. Its specific gravity is 1110, after complete expulsion of the air 1140. Water dissolves it more or less readily to a red, yellowish or brownish liquid of astringent taste. Shaken with water, all samples gave a frothy solution.

The separate samples gave the following characteristic reactions, viz. kino from—

1. *Eucalyptus corymbosa*, Sm. Of all samples most readily soluble in water. Solution deep blood-red; smells distinctly like Bordeaux wine, slightly acid, turbid on cooling, free from gum-resin. Bright shining surface of fresh fraction of lumps. Colour deep red.—Bloodwood gum. Victoria and New South Wales.

2. *E. globulus*, Labill. Readily soluble in water. Solution pale reddish-yellow, slightly acid, very turbid on cooling; on heating becomes clear again. No gum-resin; crumbling masses of light brownish-red colour.

3. *E. rostratus*, Schlecht. = *E. rostrata*, Cav. = *E. robusta*, Sm. Easily soluble in water and alcohol; solution neutral, free from gum-resin. Broken masses of a zircon red, sometimes light brown, mixed with bits of bark. This and several other samples are named red gum.

4. *E. leukoxylon*, F. Mueller. Same reaction as *E. globulus*. Large black-red lumps, with fibrous impurities.

5. *E. corynocalyx*, F. Mueller. Slowly but completely soluble in water; solution slightly acid, yellow red, on cooling turbid, no gum-resin. Broken reddish-brown lumps, fatty lustre, mixed with particles of bark.

6. *E. citriodora*, Hook. Easily soluble in water; solution faintly acid, smells like Bordeaux wine, yellow colour, turbid on cooling. Porous lumps with greenish lustre, like Socotrine aloes, mixed with bark. Queensland.

7. *E. maculata*, Hook. Exactly like the last. New South Wales. Goes by the name of spotted gum.

8. *E. calophylla*, R. Br. Readily soluble in water; solution yellow, slightly acid, becomes turbid on cooling, free from gum-resin. Irregular grains, light brown or red.

9. *E. amygdalina*, Labill. Easily soluble in water; solution neutral, onion-red, turbid on cooling. Black particles, and only in very thin fragments, zircon-red in transmitted light, fatty lustre, very tough, rich in fibrous bark.

10. *E. piperita*, Sm. Easily soluble in water; solution yellowish-red, neutral, free from gum-resin. No turbidity on cooling. Dense pieces of zircon-red, translucent.

11. *E. pilularis*, Sm. Readily soluble in water; red solution, faintly acid, turbid on cooling, traces of gum-resin. Pieces, opaque, earthy, or with slight fatty lustre, dark reddish-brown. Known as Black's bottle gum.

12. *E. fabiorum*, Schlecht. Not readily soluble in water; solution yellowish, faintly acid, turbid on cooling, contains gum-resin. Particles, dark black-red, slightly transparent, shiny fracture.

13. *E. fissilis*, Muell. Reddish solution, neutral, remaining clear on cooling, trace of gum-resin. Tough drops, blackish-red, zircon-red, translucent, fatty lustre on fracture.

14. *E. gigantea*, Hook. Little soluble in water; solution brownish, neutral, no turbidity, rich in gum-resin. Tough, drop-like pieces, of a zircon-red.

15. *E. viminalis*, Labill. Only partly soluble in water, with light-brown colour, contains a little gum-resin. Brittle, like kino.

16. *E. obliqua*, L'Hér. Taken as identical with *E. gigantea*. Completely soluble in water, with deep red colour, neutral, no turbidity, free from gum-resin. Looks like kino.

These samples show a pretty uniform reaction; they all give with sulphuric acid a pale red, flocculent precipitate; the aqueous solution always gave with perchloride of iron a dirty green precipitate, with the exception of *E. obliqua*, which gave a dark violet coloration. The precipitate is, of course, owing to kino tannic acid; and the one exception is explained by the above-named characteristics of this acid.

The solutions of the different samples give, on addition, first of muriatic acid and then of ammonia, precipitates of different colours. No. 14 gives a yellowish-red precipitate, which, on exposure to air, becomes of a rusty red. No. 16, dark violet precipitate. The precipitate with No. 15 blackens in the air. Ammonia added to the original solution produces no effect, except a deeper coloration; chloride of ammonium is indifferent.

There are many statements in literature as to the origin of this substance. *Eucalyptus resinifera*, Sm., is generally said to be the plant from which it is taken, but it was exactly the drug obtained from this plant which led Flückiger to the belief that it was merely a coloured gum. The author obtained from Dr. Moore, Director of the Botanical Gardens at Sydney, a sample of gum from the Paris Exhibition, section New South Wales, which was taken from *E. resinifera*. It was found to be a genuine gum-resin, and the author has reason to assume that this gum-resin, which voluntarily oozes out from the tree, is a product of *E. resinifera*, together with the Eucalyptus kino. Bentham and Mueller give two different gums from the same tree, viz. a grey gum, very likely the true gum-resin, and a "red gum," which, no doubt, is a species of kino.

Many of the above-named botanical species have hitherto not been known to yield any gum.

Nothing is known about the preparation of the substance, but the presence of bits of bark lead to the idea that it has been obtained from the bark. The look of the Eucalyptus kino, the similarity with ordinary kino and the presence of pyrocatechine in several samples, point to the conclusion that it is an extract from the bark obtained by artificial drying.

The Eucalyptus kino, like catechu or ordinary kino, is applicable for tanning and dyeing. According to Messrs. J. Rosisto and Co., of Melbourne, large quantities may be obtained. The value of the samples varies very much, the best are from *E. corymbosa*, *E. rostrata* and *E. citriodora*; the least valuable from *E. fabiorum*, *E. gigantea* and *E. viminalis*.—*Zeitschr. d. allg. Oest. Apotheker-Vereines.*

THE ACTION OF HYDROBROMIC ACID ON CODEIA AND ITS DERIVATIVES.

BY C. R. A. WRIGHT, D.SC.

(*Concluded from page* 86.)

The portion insoluble in ether of the batch from which hydrochlorate B was obtained was treated with HCl, and fractionally precipitated by strong acid several times successively. This mode of treatment was adopted rather than that with HBr, as a much larger yield is obtained thus, the hydrochlorates of chlorotetracodeia and chlorotetramorphia being much less soluble in dilute HCl than the corresponding brominated bodies are in dilute HBr. Finally, nearly white flakes were obtained, presenting all the characters of chlorotetramorphia hydrochlorate, and yielding the following numbers after drying at 100°:—

0·2480 grm. gave 0·5610 CO_2 and 0·1410 H_2O.
0·1390 grm. gave 0·0755 AgCl.

	Calculated.		Found.	
C_{68}	816·0	61·79	61·70	
H_{79}	79·0	5·98	6·32	
Cl_5	177·5	13·44	..	13·45
N_4	56·0	4·24		
O_{12}	192·0	14·55		
$C_{68}H_{75}ClN_4O_{12}, 4HCl$	1320·5	1000.00		

Hence the portion insoluble in ether must have been bromotetramorphia.

The simultaneous formation of bromotetramorphia and deoxymorphia from bromocodide is explainable in two ways, either—

(I.) $$\underbrace{5C_{18}H_{20}BrNO_2}_{\text{Bromocodide.}} + 4H_2O$$
$$= \underbrace{C_{72}H_{83}BrN_4O_{12}}_{\text{Bromotetracodeia.}} + \underbrace{C_{18}H_{21}NO_2}_{\text{Deoxycodeia.}} + 4HBr.$$

(II.) $$\underbrace{C_{72}H_{83}BrN_4O_{12}}_{\text{Bromotetracodeia.}} + 4HBr$$
$$= \underbrace{C_{68}H_{75}BrN_4O_{12}}_{\text{Bromotetramorphia.}} + 4CH_3Br.$$

(III.) $$\underbrace{C_{18}H_{21}NO_2}_{\text{Deoxycodeia.}} + HBr = \underbrace{C_{11}H_{19}NO_2}_{\text{Deoxymorphia.}} + CH_3Br;\ \text{or}$$

(IV.) $$\underbrace{C_{18}H_{20}BrNO_2}_{\text{Bromocodide.}} + HBr = \underbrace{C_{17}H_{18}BrNO_2}_{\text{Bromomorphide.}} + CH_3Br.$$

(V.) $$\underbrace{5C_{17}H_{18}BrNO_2}_{\text{Bromomorphide.}} + 4H_2O$$
$$= \underbrace{C_{68}H_{75}BrN_4O_{12}}_{\text{Bromotetramorphia.}} + \underbrace{C_{17}H_{19}NO_2}_{\text{Deoxymorphia.}} + 4HBr.$$

Of these two views, the first involves only known substances and reactions similar to those already known in the codeia series of derivatives, and is, moreover, probable from the circumstances that the numbers obtained in some instances indicate the presence of deoxycodeia as well as deoxymorphia; whilst the second view involves the not improbable existence of bromomorphide, $C_{17}H_{18}BrNO_2$; on the other hand, it will be shown in the next section that equation (III.) represents a reaction which does not readily take place with deoxycodeia, when not in the nascent condition at any rate.

Whichever view be adopted, the ultimate formation of bromotetramorphia requires the action of water on a brominated body, substituting hydroxyl for bromine by a reaction perfectly parallel to that whereby codeia is regenerated from chlorocodide by the action of water,* viz.:—

$$C_{18}H_{20}ClNO_2 + H_2O = HCl + C_{18}H_{21}NO_3.$$

3. *Action of Hydrobromic Acid on Deoxycodeia.*

In the hope that this action would give rise to methyl bromide and deoxymorphia, deoxycodeia hydrobromate was heated to 100° for two hours with about five parts of 48 per cent HBr; no change whatever took place, no methyl bromide being found on opening the tube in which the digestion was carried on after complete cooling. After an hour's additional exposure to a temperature of 120°–130°, the contents of the tube were found to have become black and tarry, while a small quantity of methyl bromide floated on the top. Precipitated by sodium carbonate, a very dirty substance was obtained, which was almost insoluble in ether; the ethereal extract, shaken with HBr, gave a small quantity of a tarry hydrobromate, of which 0·1330 grm. gave 0·0790 AgBr, or Br = 25·20 per cent., deoxymorphia hydrobromate requiring only 22·86 per cent.

Nothing fit for analysis could be obtained from the portion insoluble in ether, and the minute yield of pure deoxycodeia from codeia precluded a repetition of the experiment.

4. *On the Physiological Action of the Foregoing Codeia Derivatives.*

BY MICHAEL FOSTER, M.A., M.D.

The hydrochlorate of chlorotetracodeia and the hydrobromate of bromotetramorphia, in doses of a decigramme by subcutaneous injection or by the mouth, produced in adult cats in a very few minutes a condition of great excitement, almost amounting to delirium, accompanied by a copious flow of saliva and great dilatation of the pupils. Micturation and defæcation occurred in some instances, and vomiting was observed on two occasions with the morphia-salt, but was very slight. The excitement was very peculiar, being apparently due partly to increased sensitiveness to noises, and partly to an impulse to rush about.

The same doses of the morphia-salt given to a young kitten produced the same flow of saliva, dilatation of pupils, and excitement (without vomiting); but the stage of excitement, which in adult cats passed gradually off in a few hours, was followed by a condition marked by a want of co-ordination of muscular movements, and presenting the most grotesque resemblance to certain stages of alcoholic intoxication. This stage was followed in turn by sleepiness and stupor, in which the kitten was left at night; in the morning it was found dead.

Two observations have shown these salts paralyse (in dogs and cats) the inhibitory fibres of the pneumogastric; they also seem to lower the internal tension, but want of material has prevented from ascertaining how this is brought about.

On *rabbits* neither salt, even in doses of a decigramme, seems to have any effect, except perhaps a slight excitement. There is no dilatation of the pupils, no flow of saliva, and, if one observation can be trusted, no paralysis of the inhibitory fibres of the pneumogastric.

No marked difference was observable between the two salts, except that the morphia salts seemed rather more potent than the corresponding codeia bodies.

The salts of deoxycodeia and deoxymorphia given by mouth or by subcutaneous injection, in doses of a decigramme, produced in adult cats, almost immediately after exhibition, a series of convulsions much more epileptic in character than tetanic. In one case there was a distinct rotatory movement.

In a few minutes these convulsions passed away, leaving the animal exhausted and frightened. Then followed a state of excitement with dilated pupils and flow of saliva, very similar to the effects of the tetracodeia and tetramorphia salts, but less marked.

* Matthiessen and Wright, *Proc. Roy. Soc.*, vol. xviii. p. 88.

Doses of half a decigramme given to adult cats produced the state of excitement only without the convulsions.

In no case, with any specimen of product, has vomiting been witnessed.

Trials with rabbits gave only negative results. Like the tetracodeia and tetramorphia products, the deoxycodeia and deoxymorphia salts appear to paralyse the inhibitory fibres of the pneumogastric.

No marked differences could be observed between the hydrochlorates and hybromates of deoxycodeia or deoxymorphia.

THE MODERN ASPECTS OF THERAPEUTICS.

BY WALTER G. SMITH, M.D.

(*Continued from page* 87.)

It has lately become the fashion to decry the study of materia medica, and it is asserted that the possession of such knowledge is a useless burden on the memory. I am persuaded that this is a mistake, and a serious one, and I am sure that many will from repeated experience bear me out in the belief that an accurate knowledge of the characters and properties of drugs is of every-day utility to the prescriber, in enabling him to formulate correctly, to detect imposture, to avoid improper combinations, and to explain any phenomena that may unexpectedly arise.

Since our ignorance of the curative resources of the organism, and of the healing powers of drugs have been, and still are, the chief sources of error in therapeutics, and the chief obstacles to its improvement, it follows that the foundation-stone for positive knowledge must be laid in more accurate investigations into the real properties of drugs, and this leads me to consider how we may best set about such improvement, and in what directions we can look for assistance in such a course. I shall pass over without further reference the direct gains to therapeutics, and the lessening of the chances of confusion which flow from improved methods of diagnosis, from the more strict localization and classification of disease, and from the prosecution of physiological and pathological studies, and will direct attention, in the first place, to the influence which organic chemistry and physics are now extending over practical medicine.

The outcome of all recent developments in science, and, in especial, the doctrine of the correlation of force, *i.e.* the indestructibility or conservation of energy, the corner-stone of science, has been to render it in the highest degree probable that plants and animals are under the operation of the same laws as inorganic nature, and that all the changes and processes which are unceasingly at work within us are mainly the result of the action of physical and chemical forces upon the material constituents of our frame. The human body has often been compared to a machine, and though the comparison between a living body and an inanimate machine should not be pushed too far, still the forces operating on each can reasonably be compared, and the more closely we know the limits of health, and the deviations that may occur from it consistent with life, the more surely can we propose to rectify the errors in function. Hence it is plain that a truly expressed science of medicine cannot be evolved except by endeavouring to refer the processes going on in the animal body, and therefore also the influence of remedies on these, to the ultimate laws of physics, chemistry, and physiology. "Chemical inquiry is now finding its way into many of the remoter secrets of function, and is likely before long to establish some laws of molecular constitution which will enable us to classify unknown remedies, and to explain and calculate their actions." (Dr. Allbutt.)

The observations of Bence Jones and Dupré, who were the pioneers of this work in this country, have disclosed a rich mine of discovery, and they have demonstrated the existence of a chemical circulation within the body, which rivals in importance that of the older mechanical circulation of the blood. By the application of spectrum analysis they have shown the wonderful rapidity with which crystalloids diffuse from the blood into the colloid tissues, and from the tissues into the absorbents, and so the passage of all substances through the human body is determined by the laws of diffusion, modified by pressure. For example, if 20 grs. of carbonate of lithium are taken into the stomach, it will, in two and a half hours, have passed into every particle of the textures, and beyond the blood circulation even into the most distant parts, and in three and a half hours it will be distinctly present in each particle of the lens. In about seven days the lithium will be entirely eliminated from the body. When 7 grs. of carbonate of lithium were given eight hours before delivery, the lithium was subsequently detected in each particle of the umbilical cord.

Again, they have determined the existence, in animals, of a widely diffused substance which closely resembles quinine, and which has been named animal quinoidine. This leads to a plausible supposition, the only one yet offered, as to the mode of action of quinine in curing ague, and the hypothesis, though not proven, opens up a hopeful prospect of possible discovery.

The history of organic synthesis dates only from the year 1828, and remained comparatively barren for some years, but since the year 1845, its progress has been truly marvellous. The most complex substances are being formed at will, while the last barriers between organic and inorganic bodies are disappearing, and as the advances in this branch of science are, if I may say so, in the highest degree cumulative, the time is probably not far distant when, by the artificial formation of morphia and quinia, we shall be able to dispense with the production of opium, and the cultivation of cinchona in our colonies.

Every schoolboy is now familiar with the derivation of the most diverse colours from coal tar, and it is but the other day that alizarine, the colouring principle of madder, has been built up from another component of coal tar—the first instance of the artificial production of a vegetable colouring matter. We have just learned that artificial indigo has been isolated, and we may confidently hope soon to see the alkaloids brought into the market, derived not from their natural sources, and dependent on precarious supplies, but furnished to us by the laboratory of the chemist—the true magician of our age. [Even since these lines have been written, Schiff has announced the first attainment of this result in the artificial formation of conia.] The insight which we shall thus gain into the constitution and intimate nature of complex organic molecules must prove of inestimable value as a stepping-stone to a true classification of remedies. So comprehensive is the aim of modern chemistry, and so wide the means of research, that "we can foresee a state of chemistry in which, without studying the properties of different bodies in detail, and knowing only the number, atomicity, and electric polarity of the elements, it will be possible to determine by simple calculation the formulæ, properties, and mode of preparation of all compounds possible." (Naquet.)

In a philosophic and suggestive paper, Dr. Broadbent has made a bold attempt to apply chemical principles in explanation of the action of remedies and poisons, in which are contained, I believe, the elementary principles of scientific therapeutics. Starting from the two postulates—1st. That there must be some relation between the substance administered and the human organism on which the effects produced depend. 2nd. That, so far as the substance is concerned, the basis of the relation can only be its *chemical* properties, using this term in its widest sense, certain important corollaries flow from these:—1. That the physiological and therapeutical actions of the same substance must be similar in kind. 2. That the action of foods, medicaments, and poisons in the system, must be capable of explanation on the same principle. 3. That substances closely allied chemically, must have an analogous action on the system, or the diversity in their operations should be capable of explanation on chemical principles; in other words, chemical groups ought to form therapeutical groups. This is an outline of the path to be pursued, and some steps of importance have been already gained by individual workers. In England and Scotland the names of Bence Jones, Richardson, Crum Brown and Fraser, stand out in honourable relief; in France, among a number of observers, Mialhe, Rabuteau and MM. Pélissard, Jolyet, and Cahours; and in Germany, Liebreich, Binz and many others have pursued the investigation of the physical and chemical action of drugs with results most encouraging, though as yet imperfect and incomplete.

In determining the action of any substance from a chemical point of view, Dr. Richardson has shown that we have to consider five points, viz.:—1. The elementary basic or radical composition of the substance to be tested, and the changes of constitution to which it may be subjected; 2. The physical qualities of the substance; 3. The chemical stability of the substance; 4. The physical peculiarities of the animal body subjected to the substance; and 5. The special action of the substance on special centres of the animal organism.

Some scattered attempts to express the relation which, no doubt, exists between the physiological action of a substance and its chemical composition and constitution (*i.e.* the mutual relation of the atoms in the compound) have, from time to time, been made, but until lately with trifling success. For example, it has long been observed that, as a rule, the salts of the same base and of the same acid have respectively a common physiological action, and Mr. Blake, of California, pointed out many years ago, and has lately extended his experiments, that, in general, isomorphous substances have analogous actions.

(*To be continued.*)

SUNFLOWER-SEED OIL.

The highly ornamental and extensive genus of plants to which this plant belongs derives its scientific name, *helianthus*, from *helios*, sun, and *anthos*, a flower, on account of the brilliant colour of the flower, and from the erroneous idea, propagated by poets and others, that the flowers always turned towards the sun—hence, also, the French name *tournesol*. It appears to possess far more profitable qualities than have been hitherto supposed, and may be cultivated with advantage and applied to many useful purposes. An acre of land will contain 25,000 sunflower plants, at twelve inches distance from each other.

The great variety of valuable properties belonging to the sunflower seed have been much neglected. No plant produces such fine honey and wax, and when the flower is in blossom, bees abound on it. The produce will be according to the nature of the soil and mode of cultivation; but the average has been found to be fifty bushels of the seed per acre, which will yield fifty gallons of oil. The oil is excellent, when refined, for table use, for burning in lamps, for soap making, and for painting —especially for mixing green and blue paints. The marc, or refuse of the seeds of the above quantity after the oil has been expressed, made into cakes, will produce 1500 lb., and the stalks, when burnt for alkali, will give 10 per cent. of potash. The green leaves of the sunflower, when dried and burnt to powder, mixed with bran, make excellent fodder for milch cows. It makes a beautiful soap, particularly softening to the hands and face, and is pleasant to shave with. The cake is superior to linseed for fattening cattle. Sheep, pigs, pigeons, rabbits, poultry of all sorts, etc., will fatten rapidly upon it, and prefer the seed to any other; it causes pheasants in particular to have a much more glossy plumage and to be plumper in the body. It also increases the quantity of eggs from poultry fed with it. The seed, shelled, makes when ground very fine sweet flour for bread, particularly tea-cakes.

The sunflower will grow in any corner that may be vacant, and will give a farm a most agreeable garden-like appearance. It should be planted about six inches apart, and about one inch deep, and when about one foot high should be earthed up; it then will require no further attention. Every single seed will produce 1000 or more; the main head generally produces 800 to 1000 seeds, and there are usually four collaterals, producing 50 to 60 seeds each. But it is not the seed only that is valuable, for by treating the stalk exactly as flax, it will produce a fibre as fine as silk, and that in large quantities. Now that rags have become so valuable, arising from the unprecedented demand for paper, the stalk might be made useful for that purpose.

On some grounds two crops may be growing at the same time. When the farmer has given his early potatoes a last hoeing, he may plant this seed twelve inches apart in the ridges. The Chinese have it by thousands of tons and worship it. There can be no doubt that many of their silk goods have a large portion of the sunflower fibre in them. According to Boussingault, some experiments made by M. Gauzac, of Dagny, gave the produce per acre of seed, at 15 cwt. 3 qr. 14 lb.; the oil per acre 275 lb., being 15 per cent. and the cake 80 per cent. Next to poppy-seed oil, sunflower oil burns the longest of any in equal quantities. The seeds vary in colour, being either white, grey, striped or black. From them is expressed a palatable clear and flavourless oil, the demand for which in Russia is very great. It is exported from St. Petersburg at about 10*s.* 6*d.* the cwt., and is said to be extensively used, like cotton-seed oil, after purifying, for adulterating olive or salad oil.

In Russia a considerable quantity is grown for oil pressing. The plant is largely cultivated in Kiels and Podolia, eastward on the black soil lands. The stalks are used for fuel. The manufacture of the oil, which was formerly confined to the Government of Voroneje, has recently been carried on in that of Saratov, and in the town of that name, there were, in 1867, at least thirty oil-presses. Mr. Alexander Knobloch, of Sarepta, has one worked by steam power. The seed is supplied by the peasants of the neighbourhood. The production in Russia in 1867 (including a few other miscellaneous oil seeds) was officially stated at 335,000 cwt. At Voroneje 6000 to 8000 poods (of 36 lb.) of seeds are produced. In Russia the seed sells at about 40 copecks the pood, or 2 roubles 60 copecks the chetwert; the oil at $3\frac{1}{2}$ to 4 roubles the pood.—*Journal of Applied Science.*

BRITISH PHARMACEUTICAL CONFERENCE.

On Thursday evening the British Pharmaceutical Conference Dinner was held in the Royal Hotel, Edinburgh. There was a large attendance. Mr. BAILDON occupied the chair; Mr. G. BLANCHARD acted as *croupier*. The usual loyal and patriotic toasts were succeeded by the following: "Success to the British Pharmaceutical Conference," proposed by the CHAIRMAN, replied to by Mr. STODDART; "The Colleges of Physicians and Surgeons," proposed by the *croupier*, acknowledged by Dr. ALEXANDER WOOD; "Prosperity to the Pharmaceutical Society of Great Britain," proposed by Professor ARCHER, replied to by Mr. T. H. HILLS; "The Officers of the British Pharmaceutical Conference," by Mr. FLUX, responded to by Mr. G. F. SCHACHT and Doctor ATTFIELD; "The Memory of the Founder of the Pharmaceutical Society;" "The Edinburgh Committee of the Conference," proposed by Mr. DEANE, acknowledged by Mr. BAILDON and Mr. MACKAY; "The Visitors," by Mr. J. R. YOUNG, responded to by Mr. DEANE, Mr. T. H. HILLS and Dr. EDWARDS; "The Pharmaceutical Associations of America and Canada," proposed by Mr. HANBURY, replied to by Dr. EDWARDS; "The Pharmaceutical Press," proposed by Mr. CARTEIGHE, and replied to by Dr. PAUL and Mr. WOOTTON. Other toasts were "The Ladies," "The Croupier."

The Pharmaceutical Journal.

SATURDAY, AUGUST 5, 1871.

Communications for this Journal, and books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE CONFERENCE MEETING.

THE success that we anticipated some months ago would attend the meeting of the Conference at Edinburgh has been fully realized, and the weather, though fickle, has been sufficiently fine to admit of the various attractions of the city being duly appreciated.

After the delivery of the address, which will be found at page 112, and after the usual votes of thanks had been proposed and passed, the further business of the meeting was commenced by Professor WRIGHT, of St. Mary's Hospital, reading a paper on Some Oxidation Products of Essential Oil of Orange Peel, and then giving an interesting account of the results obtained in his experiments on codeia, part of which have already been published in this Journal. This investigation, connected with a material of great importance in pharmacy, has well served to illustrate how much the chemist's capacity of detecting differences has been developed in advance of his power of giving verbal expression to the differences he has made out to exist between substances. In a report on the chloral of trade, Mr. MASON expressed himself satisfied with the quality of this medicine, and Mr. PATTISON MUIR sent a paper on the same subject, in which he stated that his results are consistent with those published in this Journal some months ago. The remaining papers read on Tuesday were "Pharmaceutical Notes on *Rhamnus Frangula*, Linn.," Mr. H. C. BAILDON; "The Compound Iron Mixture of the British Pharmacopœia," Mr. C. A. STAPLES; "Report on the Purity of the Permanganate of Potassium of Pharmacy," Professor ALLEN, F.C.S.; "On the Use of Blistering Flies in Hydrophobia," HENRY GROVES, Florence; "Solutions," T. B. GROVES, F.C.S. Some account was also given of a new method of dealing with meat for the purpose of preservation, and Mr. BAILDON described a new wire-guard for the protection of persons engaged in bottling aerated waters.

On Tuesday evening the Conversazione was held in the rooms of the Museum of Science and Art, at which about fourteen hundred ladies and gentlemen were present. Among the visitors was his Majesty the EMPEROR OF BRAZIL, who arrived about eleven o'clock. A selection of band and pipe music was performed by the band of the 93rd Sutherland Highlanders, and during the evening photographic views of Scottish scenery and buildings were exhibited by the aid of the oxy-hydrogen light.

On Wednesday, the first two papers read were on "The Crystalline Principles in Aloes," one by Professor FLÜCKIGER, the other by Messrs. T. and H. SMITH. These papers gave rise to a lively and prolonged discussion. After these, papers were read by Mr. GREENISH on "Linseed and Linseed Meal," and by Mr. STAPLES on "The Tincture Press." Another paper, by Professor FLÜCKIGER, was on "Wild Rue, *Semen harmalæ*," and a second paper by Mr. STAPLES was on "A Mode of obtaining Distilled Water."

Dr. EDWARDS then made some verbal remarks on cheap microscopes and apparatus. Following this, Mr. ATKINS read a paper on "Pharmaceutical Ethics," which called forth remarks from the PRESIDENT, Mr. SCHACHT, Mr. MACKAY, Mr. DEANE, Dr. EDWARDS and other members of the Conference; others also desired to speak, but the time of closing the meeting having passed, it became necessary to take as read the papers on the "Preparation of Liquor Bismuthi," by Mr. C. H. WOOD, and on "Pharmacopœial Nomenclature," by Mr. C. R. C. TICHBORNE, and proceed to the remaining business.

All these papers, or abstracts of them, together with a full report of the discussions, will appear in the next few numbers of the Journal.

On the motion of Dr. PROCTOR and Mr. KINNINMONT, a unanimous vote of thanks was passed to the readers of papers.

On the motion of Mr. SCHACHT, Mr. SAVAGE and Mr. ATKINS, an equally unanimous vote of thanks was passed for the efforts of the Edinburgh pharmacists in organizing for the Meeting and for the hospitality shown and already in store for visitors to the Conference,—especially connecting with this vote the names of Mr. MACKAY and Mr. BAILDON.

The Meeting then proceeded to the election of officers. A letter from Mr. REYNOLDS resigning the post of Secretary was read and called forth a lively expression of regret, which Professor ATTFIELD was requested to express to Mr. REYNOLDS.

The following were then chosen office-bearers for the ensuing year:—

President: Mr. H. B. BRADY.

Vice-Presidents: Messrs. H. DEANE, D. HANBURY, W. W. STODDART, R. BENTLEY, J. INCE, J. WILLIAMS, R. REYNOLDS and SAVAGE.

Mr. F. B. BENGER was elected General Secretary in place of Mr. REYNOLDS, and Mr. T. GLAISYER Local Secretary at Brighton.

The proceedings of this year's Meeting were brought to a close on Thursday evening by the usual Dinner, which was provided at the Royal Hotel. About eighty or ninety members dined together, the

Executive Committee being the guests of the resident members. A list of the toasts will be found in another column.

LIME AND LEMON-JUICE.

According to the terms of a statement made in the Pharmaceutical Journal of the 1st ult., we have now to lay before our readers a condensed *résumé* of evidence that exists as to the antiscorbutic value of lime and lemon-juice. Prior to the year 1795, scurvy was a very great bane to the sailor and caused much mortality. In 1780, according to Budd, "the squadron under Admiral Geary, after a cruise of ten weeks in the Bay of Biscay, returned to Portsmouth with 2400 men affected with it." But in the year above quoted lemon-juice was introduced into the Royal Navy, and in 1813 the diminution of sick and of deaths was in the proportion of nearly four to one. Thus much for the prophylactic effects of the juice. But as both lime and lemon-juice are costly, and are kept with difficulty in good condition, many trials have been made of ingredients that enter into its composition. Citric acid has been extensively tried in convict ships and elsewhere as a *curative* agent in cases of scurvy, and the verdict given by most authorities is decidedly favourable. The potash theory has been strongly maintained by Dr. Garrod, but has failed to receive support or favourable proof from practical men. The virtues of phosphorus have been lauded by John Morgan, of Dublin, whose theory was at the outset unsound, in that he failed to perceive that, in the form proposed, no assimilation of phosphorus in the system could possibly take place. In point of fact, most writers, however sincere they be, have omitted to recognize the fact that the prophylactic, and not the curative agent is the important point to be determined. Lime and lemon-juice contain citric acid, sugar, gum and potash, with a small proportion of malic, tartaric and phosphoric acids. Citric acid has been given in the mercantile marine in lieu of lime and lemon-juice, with scurvy as the result, and the Merchant Shipping Act of 1867 (commonly called the Duke of Richmond's Act) was passed to ensure the issuing good juice to the crews of merchant ships. Since this Act has taken effect, the admissions for scurvy into the Seamen's Hospital have decreased by 70 per cent., and we must therefore believe that some practical sanitary good has accrued. But Mr. Palmer believes that the same amount of benefit may be as completely and more economically derived from the use of citrate of potash. We are not prepared to deny the soundness of the theory, but as practical proof cannot at present be brought to its aid, we must be content to lay the foregoing statements before our readers, and still think that chemists may assist by suggestions to find out, for the benefit of the physician and his patients, the special antiscorbutic ingredients of lime and lemon-juice.

THE BRITISH ASSOCIATION.

The Forty-first Meeting of the British Association, and its third visit to Edinburgh, commenced on Tuesday last. The success of the meeting, in point of numbers, is now well assured, 2094 tickets having been issued against 1241 in the year 1850, when the Association last visited that city.

At the Meeting of the General Committee a Report was read stating that arrangements had been made for the transfer of the Kew Observatory to the Royal Society, in accordance with the terms of the Gassiot trust, and recommending that it should at once be carried into effect. Other matters treated of in the Report were the assistance rendered by the Government for the proper observation of the solar eclipse of 1870, the promotion of scientific education in elementary schools, and the metric system of weights and measures. It announced the retirement of Dr. Hirst from the office of Joint-General Secretary of the Association, and recommended the appointment of Captain Douglas Galton, C.B., F.R.S., as his successor. The report also stated that a central office had been opened in London, at 22, Albemarle Street, to which place the books and MSS. formerly deposited at Kew had been removed.

Dr. Richard King proposed the formation of a separate Ethnological section, and considerable amusement was caused by the speech in which he enforced his views. The subject was remitted to the Committee of Recommendations to report upon.

In the evening, Professor Huxley having uttered a few words of graceful recognition of the kindness received during his year of office, introduced his successor, of whom he said that "gentler knight there never broke a lance." Sir William Thomson then proceeded to deliver his inaugural address. We regret that from its great length we are unable to reproduce the whole of it this week. There is little doubt but that while the scientific facts will be received with the respect due to the speaker, and the ability with which they were discussed, some of the speculation contained in the address will be sharply challenged. But it appears to be *en règle* to look forward to a certain amount of heterodox speculation at the meetings of the British Association; and one author attempts to counteract the harm that may possibly be effected this year by advertising in Edinburgh "An Antidote against the Unscriptural and Unscientific Tendency of Modern Geology, with Remarks on Several Cognate Subjects."

True to her hospitable traditions, Edinburgh is already meeting her guests much more than halfway. The Committee of Management of the University Club has elected, as honorary members of the same, a number of gentlemen now assisting at the British Association. According to the circular issued by the Committee, the use of the Club will be available to the honorary members from the 31st ult. to the 11th instant.

We would direct attention to the resolution of the Council at their last meeting, affecting occasionally the regular issue of the Journal. The proceedings of Council are in future to be published in the next issue of the Journal after the meeting, and "the Journal may on those occasions be issued on Saturday morning instead of Friday as heretofore, if necessary."

The following paragraphs, in reference to the Pharmacy Act (1868) Amendment Bill, occur in the Report recently made by the Medical Officer to the Lords of Her Majesty's Privy Council:—

"Under the provisions of the Pharmacy Act, 1868, described in my last year's report, I conveyed to the Pharmaceutical Society, in 1870, your Lordship's approval of the Society's annual list of examiners for the purposes of the Act, and have now to submit to your Lordships the satisfactory report made by Dr. Greenhow on the London examinations of the Society in 1870, as visited by him for your Lordships' information.

"I regret to report to your Lordships that the power which, for the public protection, the first section of the Act vests in the Pharmaceutical Society, to prescribe (with consent of the Privy Council) regulations as to the keeping, dispensing, and selling of poisons, is still entirely unexercised. I believe it to have been by an accidental oversight in legislation, that, while all other powers to be exercised for public purposes by the Society under the Act were vested in the Council of the Society, the language of the first section vested in the Commonalty, and not in the Council, the very important power which that section confers, and to which my present observations relate. It is, perhaps, not surprising that a large body of tradesmen should be slow to take the initiative in imposing even the most reasonable penal restrictions on themselves; but I have to submit to your Lordships, as a fact which you may deem deserving the consideration of Parliament this that non-fulfilment of the Society's duty, to make rules against dangerous slovenliness in the keeping, dispensing and selling of poisons, is a breach of the implied contract under which the Legislature in 1868 gave powers and privileges to the Society."

A Committee has been formed with the object of raising a suitable memorial to the memory of the late Professor William Allen Miller. The Rev. Principal Barry, of King's College, has been chosen chairman, Professors Bentley and Bloxam and Messrs. Cunningham and Tomlinson as secretaries, and Professor Guy as treasurer. The ordinary subscription is to be one guinea, but the list of subscribers will be published without any statement of the amounts subscribed. It is intended to devote the funds which may be raised, first to obtaining a bust or portrait of Dr. Miller, and then to the institution of a prize or scholarship bearing his name, in connection with King's College.

Nature states that M. Wurtz has announced to the French Academy the success of a young chemist in his laboratory in transforming lactose, or the uncrystallizable sugar of milk, into dulcose or dulcine, the sugar of mannite, which may easily be obtained in very beautiful crystals, by the successive reaction of hydrochloric acid and sodium-amalgam.

Transactions of the Pharmaceutical Society.

MEETING OF COUNCIL.

August 2nd, 1871.

MR. A. F. HASELDEN, F.L.S., PRESIDENT, IN THE CHAIR.

MR. EDWARDS, VICE-PRESIDENT.

Present—Messrs. Atherton, Betty, Carr, Groves, Hills, Sandford and Smith.

The minutes of the last Meeting were read and confirmed.

A letter from the Privy Council was read, approving the appointment of Mr. Alexander Noble as an Examiner in Scotland.

The Report of the Finance Committee was presented, showing on the General Fund Account a balance in the Treasurer's hands of . . . . £1812. 14*s*. 3*d*.
And submitting for payment accounts, amounting to . . . . £679. 18*s*. 7*d*.

On the Benevolent Fund Account the Secretary reported that he had received the legacy of £19. 19*s*. from the executors of the late Mr. Charles Coles; a donation of £5. 5*s*. from Mr. John Davison; and subscriptions amounting to £6. 2*s*. 6*d*.; that the present balance in hand was £231. 6*s*. 1*d*.

Resolved—That the Report be received and adopted, and payments made.

The Report of the Benevolent Fund Committee as to applications for relief having been read, it was

Resolved—That it be received and adopted.

Mr. Hills said he had received a letter from a Mr. Norcott, asking him to bring before the Society the case of the suffering French chemists. Mr. Norcott stated in his letter that he had been applied to by M. Genevaix, the President of the Society which had been formed to inquire into the present condition of the pharmaciens of the Seine, and to give assistance to the most necessitous. This gentlemen stated that the persons referred to were in a very distressed condition; that twenty-three chemists' establishments had been destroyed, and nine tradesmen had been utterly ruined, and would be unable to recommence business without assistance. A credit of 40,000 francs had been opened with the Pharmacie Centrale for an advance for drugs and chemicals, and they sought the aid of their fellow-craftsmen of Great Britain. Mr. Norcott had applied to the Lord Mayor, and also to the Society of Friends, and had obtained £200 from the former, and £50 from the latter; and he had been also requested to apply to him (Mr. Hills) with a view of bringing the matter before the Pharmaceutical Society.

The President said he had also received a letter from Mr. Norcott, who called on him, and made a similar application.

After full discussion, it was decided that the Council had no power to apply the funds of the Pharmaceutical Society to such a purpose, and the President was requested to communicate the same to Mr. Norcott.

A subscription list was, however, opened by several members of the Council for the purpose of rendering assistance.

The Report and Recommendations of the Library, Museum and Laboratory Committee having been read, it was—

Resolved—That they be received and adopted.

The Committee having recommended that the Report of each meeting of Council should be issued in the next following number of the Journal, it was

Moved by Mr. Sandford, seconded by Mr. Edwards, and

Resolved—That the Report of the Transactions of the Council be in future published in the next following number of the Journal, after the meeting of the Council, but that the Journal may, on those occasions, be issued on Saturday morning, instead of Friday as heretofore, if necessary.

Mr. Groves drew attention to a paragraph in Mr. Simon's Report to the Privy Council, a copy of which will be found at page 109 in this Journal.

The Report and Recommendations of the Parliamentary Committee having been read, it was

Resolved—That they be received and adopted.

Moved by Mr. Carr, seconded by Mr. Smith,—

Resolved—That the Registrar be instructed, and is hereby authorized, to erase from the register the name of Anthony W. Johnson.

On the Report of the "Special Committee appointed to direct the operations of the Society in communicating with the Local Secretaries and Members upon the subject of opposing the Bill" being read,

Mr. Betty said he desired to present the Report of this Committee and to wind-up the matter. They had prepared a scheduled list of the names of the towns, and the number of chemists and druggists in the district, as far as they could be obtained, with the number of signatures, and when the petitions were signed, in what proportion they were signed; also stating what Members of Parliament were communicated with, and in some instances the answers received from those gentlemen. He thought this might be published, and preserved for future reference as an index both of the feeling of the country on the matter and as a guide to action which might be hereafter taken. The number of petitions presented through the means of the Local Secretaries was 191. The first column showed the number of chemists canvassed in those districts, and the second column showed the number of signatures. The information, however, was not quite so full and complete as it might have been in all cases. But, with these exceptions, the returns might be considered very complete, and the general result was that five-sixths of those who were canvassed or asked to append their names to the petition had done so. He might also state that their action was not so thorough as had been anticipated at first, as there had been spontaneous action taken in many places, and other agencies at work, by means of which 107 other petitions were presented to the House of Commons from country Associations. For instance, in Manchester they only had 135 signatures out of 359 who were entitled to sign: but there were two or three other petitions from Manchester, which would account for the circumstance. He did not know that the Committee had anything else to report, but he wished to ask permission of the Council that the letters received by Local Secretaries from Members of Parliament and forwarded for the information of the Committee should be returned to them, with an expression of the thanks of the Council for their prompt and ample replies to the circular.

The President said the names of many of the towns, with the numbers of the signatures, had been already published in the Journal.

Mr. Betty said a complete list had not yet been printed, but the whole need not be republished. Still, he thought it would be well to publish a *résumé*, and also to state the fact that 107 other petitions had been presented, showing the feeling of the country on the subject.

Mr. Sandford asked if the list were perfectly accurate with regard to the first and second columns.

Mr. Betty said the committee had been bound by the returns of the local secretaries themselves, and he had gone through the addition of the different columns twice and believed it to be correct.

Mr. Sandford said he understood that in the case of Bristol, the figures of the first column had been omitted in the published report of the return.

Mr. Betty said the number put down in the first column was 100 and the number of persons who signed was 45; seeing that so few signed the Bristol petition he considered that there must be some error in the returns, especially as he had information from another source, and he thought he would make further inquiries before filling up the first number. He afterwards filled in the figures in pencil, not having a pen and ink at hand, and he supposed the printer did not feel himself justified in adopting them. He intended to write to Mr. Stoddart and explain the matter.

Mr. Groves said with regard to the value of these petitions, he might mention one instance. He asked a local secretary what he was doing in the matter, and was told that he had desired his young man to write letters to the local representative: but on beginning to argue the question with him, he confessed at once that he had not read the proposed regulations and knew nothing whatever on the subject.

Mr. Smith said he knew another case in which the petition would have been quite the reverse had the matter been properly explained.

Mr. Sandford said several such instances had been brought to his knowledge; in fact, he had a large mass of correspondence on the subject. The truth was that many who sent up petitions really never considered the amendments at all, but signed a petition against the Bill as it stood in its original form. There was not the same alacrity to publish the amendments which there was to publish the Bill.

Mr. Atherton said he did not see the object of this discussion.

The President said he did not think any notice should be taken in the Committee's Report of the petitions sent up irrespective of its action and through other channels.

Mr. Betty said he merely suggested it should be mentioned for general information; and really it referred to the same matter; and in several instances the Committee would have acted, but found they had been forestalled.

Mr. Edwards did not think they could regard what had been done by other parties.

Mr. Betty said he could easily effect his object by writing a private letter to the 'Journal,' stating the fact. He merely wished the members to be enlightened upon it.

It was then moved by Mr. Betty, seconded by Mr. Atherton, and

Resolved—That the letters addressed to Local Secretaries and others, forwarded to the "Special Committee for directing operations in connection with the late Pharmacy Bill," be returned to them by the Secretary, accompanied with the expression of the thanks of the Pharmaceutical Council for their prompt and ample replies to the Committee's circular.

Moved by Mr. Atherton, seconded by Mr. Betty, and

Resolved—That a copy of the foregoing resolution be forwarded by Mr. Bremridge to each Local Secretary.

REPORTS OF THE BOARDS OF EXAMINERS.

England and Wales.

July, 1871.

Examination.	Candidates examined.	Candidates passed.	Candidates failed.
Preliminary	287	199	88
Minor	60	26	34
Major	19	12	7
Modified	40	24	16
	406	261	145

Preliminary. Three Certificates were received in lieu of this Examination.

SCOTLAND.

Examination.	Candidates examined.	Candidates passed.	Candidates failed.
Preliminary	12	9	3
Minor	7	7	0
Modified	3	3	0
	—	—	—
	22	19	3

Preliminary. One certificate was received in lieu of this Examination.

JACOB BELL MEMORIAL SCHOLARSHIPS.

The Board of Examiners reported that one Candidate presented himself for the Senior Bell Memorial Scholarship and thirteen for the Junior.

The Candidate for the Senior Scholarship failed to obtain the requisite number of marks for its award.

Of the candidates for the Junior Scholarship, three who had obtained more than the requisite number of marks were nearly equal, and, as only one Scholarship was granted in 1870, the Board recommended that the Council should give a scholarship to each of these three.

It was therefore

Resolved—That Junior Scholarships be awarded to

Robert Higgins Davies,
William Ashwell Shenstone,
and
Edward Rammell,

with free Laboratory instruction and materials for the Session 1871-72.

SESSIONAL PRIZES.*

The Board also reported that during the past Session sixty-seven Candidates had passed the Minor and twenty-three the Major Examinations in honours, of whom sixteen competed for the Prize of Books and four for the Pereira Medal.

On the recommendation of the Board, it was

Resolved—That the

PRIZE OF BOOKS

be awarded to Edward Rammell.

That the

PEREIRA MEDAL

be awarded to Henry Churchill.

The Professors presented their respective Reports of the results of the competition for the Prizes offered by the Council, which, having been read, it was

Resolved—That the following awards be made:—

CHEMISTRY AND PHARMACY.

Silver Council Medal .... Henry Churchill.
Bronze Council Medal .... Charles Arthur Overton.
Certificates of Honour ...... { Horace Davenport. / Thomas Iredale.
Certificates of Merit .... { Frederick J. Hanbury. / Walter Benjamin Cole.

BOTANY AND MATERIA MEDICA.

Silver Council Medal .... Henry Churchill.
Bronze Council Medal ...... Horace Davenport.
Certificates of Honour .... { Alexander Wood. / Walter Benjamin Cole.

Certificates of Merit ...... { Charles Arthur Overton. / George Bult Francis. / Thomas Iredale. / Herbert Charles Webb. / Charles Alexander Blake.

PRACTICAL CHEMISTRY.

Silver Council Medal .... James Hughes.
Bronze Council Medal ...... Henry Churchill.
Certificates of Merit ...... { Thomas Iredale. / Harold Woolley. / Herbert E. Constance.

An extra Silver Medal was granted to Arthur Percy Smith for the excellence of his replies to the questions set.

The Professor of Botany presented his Report on the Herbaria received in competition for the

BOTANICAL PRIZE,

and upon his recommendation it was

Resolved—That the following awards be made:—

Bronze Medal .... Wm. Walter Boycott Stoddart.
Certificate of Honour .. Augustus Horton Crundall.

Resolved—That the following being duly registered as Pharmaceutical Chemists, be respectively granted a Diploma, stamped with the seal of the Society:—

Bateman, John Montague .... Canterbury.
Cole, Walter Benjamin ...... Weymouth.
Davenport, Horace .... London.
Fegan, John .... Exeter.
Goodwin, Felix.............. Newark.
Hackett, John Henry .... Lincoln.
Holmes, Nathaniel Wheatcroft. Grantham.
Iredale, Thomas .... Leeds.
Parker, John Samuel .... Peterborough.
Stoakes, Benjamin Maidens .. Boston.
Tomkins, Henry .... Bedford.
Wilford, Josiah .... Newport Pagnell.

Resolved—That the following being duly registered as Pharmaceutical Chemists, be elected Members:—

Bateman, John Montague .... Canterbury.
Churchill, Henry .... Misterton.
Davenport, Horace .... London.
Fegan, John .... Torquay.
Iredale, Thomas .... Leeds.

Resolved—That the following Associate of the Society before July, 1842, be elected a Member:—

Eyre, Jonathan Symes ...... Launceston.

Resolved—That the following registered Chemists and Druggists be elected members of the Society:—

Field, Cornelius .... London.
Holme, Isaac Clayton .... Marple.
Kendrick, John, jun. .... Redditch.
Palmer, Enoch .... Great Grimsby.
Solomon, William Henry .... Stafford.

Resolved—That the following having passed their respective Examinations be elected Associates in Business:—

MINOR.

Slater, Jonathan .... Wells.
Tonks, Joseph .... Bewdley.

MODIFIED.

Humble, William .... London.

Resolved—That the following having passed their respective Examinations, be elected Associates of the Society:—

* The Sessional Prizes and Certificates will be distributed at the evening meeting on the 4th October next. Successful candidates will be expected to attend. An Address to the Students will be delivered by Mr. Mackay, of Edinburgh. Ladies are invited to be present.

MINOR.

Baldwin, Edwin	Bury St. Edmund's.
Banks, Edward	Salford.
Brown, George	Retford.
Collins, Martin Austin	Chertsey.
Cowgill, Brian Horatio	Manchester.
Dunn, Frederick Edwin	Uttoxeter.
Ellis, George	Southport.
Emson, William Nicholls	Dorchester.
Fortnam, Frederick Henry	Willenhall.
Heppell, James	Forest Hill.
Jones, James	Carmarthen.
Kirby, Frederick	Bridgnorth.
Knight, John Tomlinson	Nottingham.
Knowles, William Edward	Dewsbury.
Maddock, William Thomas	London.
Sandy, Frederick William	Strood.
Ward, John James	Newark.
Watts, Joseph, jun.	Attercliffe.
Williams, Joseph Bower	Olney.

MODIFIED.

Beattie, John	Edinburgh.
Greatrex, Henry	Dover.
Greenway, Charles M.	Ashby-de-la-Zouch.
Palmer, Henry Bridges	Ludlow.
Pierce, William George	York.
Powell, Edward Foley	Birmingham.
Wallis, Charles James	London.

The President said Mr. Vizer had written to the Secretary, referring to the proceedings at the late annual meeting, and asking for a copy of the notice by Mr. Giles of his intention to move an amendment.

After some discussion, it was resolved that Mr. Vizer be referred to the President, who was chairman of the meeting in question, for any information he required.

EXAMINATION IN LONDON.

July 28th, 1871.

Present—Messrs. Allchin, Barnes, Bird, Cracknell, Davenport, Gale, Garle, Haselden, Ince and Linford.

Forty candidates presented themselves for the Modified Examination; the following twenty-four passed, and were declared to be qualified for registration as

CHEMISTS AND DRUGGISTS.

Coker, Owen Cole	Pimlico.
Cooper, Birkett Nelson	Dewsbury.
Corrie, Andrew Adam	Bedford.
Cory, James Thomas Haines	Penge.
Cross, John	Southwark.
Greatrex, Henry	Dover.
Greenway, Charles Marriott	Coventry.
Gregson, Henry	Burslem.
Harwood, Charles	Manchester.
Hulbert, Samuel James	Chatham.
Humble, William	Hatcham.
Littlejohn, Alexander	Aberdeen.
Neale, Benj. Thomas Mills	Wellington, Somerset.
Parrish, Edward James	Bristol.
Pierce, William George	Gravesend.
Pigott, George Herbert	Tunstall.
Powell, Edward Foley	Birmingham.
Powell, Walter Aitken	Great Malvern.
Ray, William Herbert	Barnet.
Stenson, Joseph	London.
Stewart, William Henry	Paris.
Tate, Edward Pitt	Eastbourne.
Thompson, Frederick	Sheffield.
Wallis, Charles James	London.

Proceedings of Scientific Societies.

BRITISH PHARMACEUTICAL CONFERENCE.

The British Pharmaceutical Conference commenced its public proceedings at Edinburgh on Tuesday last by a Meeting at Craigie Hall, St. Andrew's Square. After the preliminary business (which we purpose reporting in a future number), the President, Mr. W. W. Stoddart, F.C.S., F.G.S., delivered the following address:—

Address.

Gentlemen,—The continued success of our Conference is a great cause for congratulation. Since our last meeting in Liverpool, when we had so large an accession of new members, we have to report a further increase of about 300, making a present total of 1878 on our books.

On thinking this over, one cannot help exclaiming, what a large amount of good ought to proceed from such an army of workers, if they have (as I hope they have) the welfare of pharmacy at heart! It surely must be impossible that any single member can remain indifferent to an acceptance of the great chance now offered to us, of improving the position, if not of ourselves, at any rate of our children and successors. I feel confident that most of us, if not all, will be persevering and steadfast in endeavouring to secure a solidity, an honourable value to the title of pharmaceutist, by combining a good scientific training with a sound practical knowledge.

I feel sure that my words will find an echo in the hearts of those who now bid us so hearty a welcome. We have been striving to cultivate the wish for advancement in many parts of England, and now for the second time we thus try to repay the warmhearted hospitality that we all know fills the breast of every true Scotchman. In the words of one of their own favourite poets I would say,—

> "When death's dark stream I ferry o'er,
> A time that surely shall come;
> In heaven itself, I'll ask no more,
> Than just a Highland welcome."

We are now sojourning in the land that produced such men as Thomson, Brewster, Murchison, Miller, Clyde, Leslie, Adam Smith, James Watts, Livingstone, Scott, Burns, and "John Mackay."

Pharmacy, in its true bearing, is one of the many offshoots of a scientific education, and cannot be properly cultivated and pursued without a fair acquaintance with several branches of natural science. Botany is, doubtless, an important study, yet chemistry must ever be our chief ally. We may accurately describe the characters of the Asiatic poppy, or the Peruvian cinchona, and yet be sadly at a loss if we knew not how to extract the morphia and quinia. All arts and manufactures are dependent on properly carrying out chemical principle. The miner would know nothing of the riches locked up in the solid rock if it were not for chemistry. Astronomy and microscopy would be an empty idea if the chemist had not prepared the appropriate glass for the lenses, or the alloy for their support. If this be true, how much more is the preparation of medicines dependent on chemical processes! How is it that so many of our extracts, infusions, and syrups are inert, while the plants from which they are prepared are so powerful and poisonous in their action on the animal economy? Why so many prescriptions oftentimes rendered valueless? Surely because the medicines have been rudely prepared, or, as not unfrequently happens, the prescriber brings together in the prescription substances that ought to be kept as widely apart as the poison cupboard and the retail department.

Those four wonderful elements, of which all organized bodies are composed, must be carefully tended and watched, and their several likes and dislikes known, before the pharmacist can elaborate the various medicamenta in their most perfect forms.

Those extraordinary glucosides, alkaloids and hydrocarbons that fill our shelves as truly point to the Divine originator of all, as do the mental and bodily powers of the man who measures and weighs, or the memory which gives him an experience whereby he can discriminate between the good and the bad, or the useful from the useless. In short, it is Nature, the visible agent of a munificent Creator that we must obey, and on her we are entirely dependent either in the field or in the laboratory. The labours of Dumas, Liebig, Frankland, Richardson, Hofmann, Odling, Williamson, Miller and a host of others, have brought to light by their experiments an array of facts so vast, that probably no one mind can grasp them all. We need only mention the compounds of ethyl, methyl and amyl, the chloral, pepsine and chloroform, to instantly call to mind what chemistry has done to alleviate the long list of "ills that flesh is heir to."

Oxygen, in its ordinary condition, and without the aid of moisture and heat, could not destroy the pestilent gases and organisms that abound in our crowded streets and courts; but, in its allotropic form, no sooner does it come in contact with the deadly impurities from our lungs and skin, or the emanations arising from our unnatural mode of living, than it immediately attacks the evil by destroying its very constitution, and prevents its poisonous influence on our health and comfort.

Can it be right, therefore, that so many of us should be from day to day in the midst of the various ozone-producing agents and recommending their use, and yet all the while not caring to know the why and wherefore of their friendly reactions?

This remnant of the dark ages of our pharmaceutical existence I fervently hope is, or soon will be, a thing of the past, and that our successors will make a better use of the advantages that science offers than their forerunners have.

To profitably carry on our businesses we must copy nature in all her operations. As in hers so in our own laboratories, nothing should be lost and nothing wasted. The pharmaceutist should strive as strictly to account for every atom or molecule in his transformations or substitutions as for the £. *s. d.* in his cashbook. Like all other callings, our own has arrived at its present state by very slow degrees; its foundation was laid on the alchemy of the Arabians and the empiricism of the Greeks. Its superstructure was built up *stratum super stratum* by the persevering study and steady observation of the inhabitants of Great Britain, France and Germany; while our American brethren have made a good start, and with their characteristic zeal have shown, by their various publications, a practical acquaintance with pharmaceutical operations. Let us, therefore, look after our laurels, and let it not be said by our children and theirs, that *we* have delayed our march on the high-road to knowledge. I cannot look around me at the present moment without the proud conviction that we have an earnest band of inquirers, who have met together at this our annual gathering for the purpose of receiving and imparting the results of their experience and observation. Variety is a common natural ordinance, quite as much so in ourselves as in the flowers of the field. The cry of "equality" which we sometimes hear, is a fatal delusion and the dream of a lunatic. We each must humbly play our own peculiar part in one harmonious whole. *Non omnes omnia possumus.*

Perhaps of all the discoveries which modern chemistry has introduced, the most marvellous are the methods of analysis and synthesis of the organic bases. It is true that we cannot produce in our laboratories the root of the madder or valerian, the sugar-cane or the Tonquin bean, but we can manufacture alizarine, valerianic acid, sugar and coumarin. No more startling proof of the advancement of synthetical chemistry can be adduced than the discovery alluded to by Mr. Perkin at the last meeting of the British Association, in his paper on the artificial preparation of alizarine.

Who could have supposed that there was the least relationship between two such dissimilar bodies as cinchona bark and gas tar; nay, more, that they should give rise to the same substance? Yet so it seems to be. You are, of course, all aware that the cinchona barks contain the alkaloids in combination with quinic acid ($C_7H_{12}O_6$), which is also found in the coffee, bilberry, holly, privet, oak, ash, elm and many other plants.

Thirty-three years ago Woskresensky, while experimenting on quinic acid, found that when it underwent oxidation, a peculiar yellow crystalline substance was the result, and to which he gave the name quinone ($C_6H_4O_2$).

$$\underset{\text{Quinic Acid.}}{C_7H_{12}O_6} + 2O = \underset{\text{Quinone.}}{C_6H_4O_2} + CO_2 + 4H_2O.$$

For many years the atomic constitution of quinone remained a disputed question, till the researches of Graebe showed that it was a substitution product from benzol, in which two atoms of hydrogen were replaced by two of oxygen.

$$\underset{\text{Benzol.}}{C_6H_6} + 3O = \underset{\text{Quinone.}}{C_6H_4O_2} + H_2O.$$

In 1869 Messrs. Graebe and Liebermann found out that from a compound of anthracene and quinine, both of which are present in coal-tar, was formed anthraquinonic acid, better known as alizarine. It is the first instance of a vegetable colouring matter being produced by artificial means.

An equally strange discovery has been made by Mr. Broughton, the Government quinologist, who has extracted carbolic acid from the *Andromeda Leschenaultii*, a plant growing freely on the Neilgherry Hills. It is said to be of far greater purity than that made from coal tar, but probably the cost of production will prevent its coming into general use.

Since we last met, pharmaceutical chemistry has lost an able investigator by the lamented death of Augustus Matthiessen, who, in conjunction with Messrs. Foster and Wright, was making a very considerable addition to our knowledge of the constitution of the opium alkaloids. For many years past these have been a complete puzzle, and never till now had we any light thrown upon the reason why the poppy capsule should contain such a surprisingly long list of different principles. Happily the experiments on the substitution products of morphia and codeia are being continued by Mr. Wright, who is assiduously working out the subject.

When either of these bases is treated with hydrochloric acid under pressure, an entirely new base is produced, called by its discoverer apomorphia ($C_{17}H_{17}NO_2$), and although it only chemically differs from morphia by the abstraction of the elements of water, it has the most opposite properties.

$$\underset{\text{Morphia.}}{C_{17}H_{19}NO_3} - H_2O = \underset{\text{Apomorphia.}}{C_{17}H_{17}NO_2}.$$

Apomorphia is remarkable for its powerful emetic qualities and unstable nature. The chloride, which is the salt most commonly used, is white and crystalline. Its freedom from all irritant properties renders it a valuable hypodermic agent. Only $\frac{1}{8}$th of a grain by the mouth or $\frac{1}{10}$th by subcutaneous injection acts with greater rapidity than any other emetic; indeed, it is the only one capable of being administered hypodermically.

When Codeia is acted upon under pressure by an excess of hydrochloric acid, a new base is separated, which the discoverers, Messrs. Matthiessen and Wright, called chlorocodide ($C_{18}H_{20}NO_2$).

$$\underset{\text{Codeia.}}{C_{18}H_{21}NO_3} + HCl = \underset{\text{Chlorocodide.}}{C_{18}H_{20}NO_2} + H_2O.$$

A further reaction then takes place, and the chlorocodide splits up into methyl chloride and apomorphia.

$$\underset{\text{Chlorocodide.}}{C_{18}H_{20}NO_2} = \underset{\text{Methyl Chloride.}}{CH_3Cl} + \underset{\text{Apomorphia.}}{C_{17}H_{17}NO_2}.$$

So that the curious fact appeared that codeia only differed from morphia by containing one equivalent more of methyl. Although, however, they obtained apomorphia from codeia, they were unable to reconvert apomorphia into morphia, and thus form morphia directly from codeia.

Dr. Hugo Schiff, of Florence, has announced that he has succeeded in artificially producing conia, the active principle in *Conium maculatum*. He says that when butyraldehyd is acted upon by alcoholic ammonia, dibutyraldin is formed.

$$\underset{\text{Butyraldehyd.}}{(2\,C_4H_8O)} + NH_3 - H_2O = \underset{\text{Dibutyraldin.}}{C_8H_{17}NO}.$$

By the dry distillation of the latter, conia, among other products, is eliminated, and may at once be recognized by its peculiar odour.

$$\underset{\text{Dibutyraldin.}}{C_8H_{17}NO} = \underset{\text{Conia.}}{C_8H_{15}N} + H_2O.$$

Mr. D. Howard has described a new cinchona alkaloid, which he detected by noticing an unusual loss when recrystallizing quinia. The new base is still under investigation, but seems to be nearly related to quinia, for its oxalate only differs by containing three more molecules of water. Chlorine and ammonia also produce the green colour and precipitate of dalleiochin, which is characteristic of quinia and quinidin. It differs, however, by the solution not being fluorescent.

Chloral hydrate appears now to have become a recognized addition to our materia medica as a good hypnotic. It may, however, be well to note that a comparatively large number of deaths have occurred from its use during the past year. In every case the fatal result has arisen from one of two causes,—either from an overdose, or else by the dose having been repeated too frequently, one having been swallowed before the effect of the previous one had passed away. A very remarkable instance of the latter recently came under my notice, and has been fully described by Dr. Norris in the *Lancet* (Feb. 28th, 1871). The deceased had taken 712 grains in nine days, 260 of which had been swallowed within 36 hours. Every part of the organs sent for analysis was preserved in the most extraordinary manner.

Not until 130 hours after death did the slightest odour of decomposition become perceptible. Chloroform was obtained plentifully from the tissues by distillation, after the addition of an alkali.

Professor Wurtz has stated to the French Academy of Sciences, that the nitrate of strychnia, used hypodermically, is an antidote to the poisonous effects of chloral. I have not, however, seen a confirmation of this strange announcement.

In the *Ann. der Chem. und Pharm.* 1870, Mr. Lieber describes a very convenient method of detecting the presence of alcohol in chloroform or chloral hydrate. He effects this by warming the suspected sample in a test-tube with a little iodized potassium iodide, and afterwards potassium hydrate. If alcohol be present, crystals of iodoform will be deposited.

Anæsthetic agents are still the subjects of much discussion. Bichloride of methylene and nitrous oxide have been tried over and over again by their respective admirers, but the weight of evidence seems to be in favour of the latter. The bichloride has too frequently induced nausea, a most distressing accompaniment to its administration, while the nitrous oxide appears to give almost universal satisfaction. Not one fatal accident has happened, although, within the last twelve months, it has been in daily use by dentists.

At a late meeting of the Medical Society in London, Dr. Richardson introduced metachloral, a singular isomer of chloral, and decomposable also by alkalies into chloroform and formic acid, but physically differing by being completely insoluble in either water, alcohol, or ether. It is a white greasy powder, which may be reconverted into soluble chloral by being heated to 180° C.

One of our esteemed corresponding members, Dr. Flückiger, has noticed an interesting property of oil of peppermint. When shaken with nitric acid, the oil exhibits a magnificent greenish-blue fluorescence. This hitherto undescribed phenomenon is extremely beautiful, especially when the electric spark is passed through it by means of the ordinary vacuum tube. The doctor remarks that, unfortunately, it is not a true test for the purity of the oil of peppermint, because other oils may be present without preventing the fluorescent appearance.

In a lengthy paper read at the Chemical Society, and reprinted in our Journal, Dr. Divers has made an important addition to our hitherto imperfect knowledge of ammonium carbonate. It appears that there are four varieties of this salt, having a simple relation to each other, and capable of crystallization from a solution, viz.:—

Normal Ammonium Carbonate,			$(CO_2)_2(H_2O)_4(NH_3)_4$
Half-acid	,,	,,	$(CO_2)_3(H_2O)_4(NH_3)_4$
Acid	,,	,,	$(CO_2)_4(H_2O)_4(NH_3)_4$
Hyper-acid	,,	,,	$(CO_2)_5(H_2O)_4(NH_3)_4$

Dr. Davies finds that by digesting these carbonates at a gentle heat with liq. ammon. fort., they become converted into ammonium carbamate ($NH_4NH_2CO_3$), thus furnishing a curious example of the dehydration of a salt in the presence of water. He agrees with Dr. Attfield, that the commercial ammonium carbonate is a compound salt of carbonic and carbamic acids, and is remarkably constant in its composition. Dr. Divers also states that, when ammonium chloride and calcium carbonate are heated together, as directed in the British Pharmacopœia, the product is not commercial ammonium carbonate. This is an after product during the refining.

New localities have been successfully tested for the cultivation of the poppy and cinchona plants. At the January meeting of the Pharmaceutical Society, a paper by Mr. Ward was read on a sample of Australian opium, collected in Gipps' Land, and sent to Mr. Hills for examination. It contained no less than 9 per cent. of morphia, so that the Australian climate may eventually prove favourable to the growth of the poppy plant.

In America, also, the production of opium has been tried as a profitable speculation. Mr. Wilson, of Vermont, has sown $6\frac{1}{4}$ acres of land with opium poppy-seed. From the resulting crop were gathered 640 pounds of opium, averaging 6·25 per cent. of morphia and realizing 10 dollars per pound.

In Ceylon the cultivation of the cinchona has attracted considerable attention. The analysis of a sample sent to England showed that each pound of the bark yielded 289 grains of sulphate of quinia, 47 grains of quinidine and 14 grains of cinchonine.

Last year, at the Liverpool meeting, Dr. C. Calvert called attention to some experiments he had been making on the composition of iron-rust. In our text-books the rust of iron is described as the hydrated peroxide of iron, with a trace of ammonia. The results of his analyses show, however, that rusted iron is a complicated compound of 93 per cent. of peroxide, 6 of protoxide, $\frac{9}{10}$ per cent. of carbonate of iron, $1\frac{1}{2}$ per cent. of silica, with a trace only of ammonia. Dr. Calvert finds that the idea of iron rusting from the presence of moist oxygen is entirely wrong. A long series of experiments proved that neither moist oxygen nor moist or dry carbonic acid, *separately*, had any action on iron, but that *a mixture of both* acted very energetically. Carbonic acid is the agent that determines and promotes the oxidation of iron, and not oxygen or aqueous vapour. This explains the curious fact that the presence of alkalies or their carbonates will prevent the oxidation of iron.

Our excellent Secretary, Dr. Attfield, with his usual aptitude for the practical application of his favourite science, has given an exhaustive paper on a proposed new nomenclature for universal adoption in future editions of the Pharmacopœia. The continual changes that have hitherto taken place, and the consequent increase of synonyms, are often a cause of much perplexity to the dispenser. I hope that the doctor's suggestions may be fully considered by future compilers of the next editions of our own, as well as those of other countries. We should then be unanimous, and travellers would have less difficulty in getting their prescriptions prepared.

In the provinces, Pharmaceutical education is gaining ground more and more. Papers read at meetings of the several Associations throughout the country, show that private study and the number of students are rapidly increasing.

In America, pharmacy seems to be prosecuted with more than usual vigour. They seem determined, in that part of the world, to fulfil the words of one of their poets, when he told them that—

"Though before you mountains rise,
Go ahead!
Scale them certainly you can,
Let them proudly dare the skies;
What are mountains to a man?"

At the December meeting of the Philadelphia College of Pharmacy, Dr. Maisch made an important communication respecting the solution of acetate of morphia and other alkaloids,—a subject, however, that had previously been alluded to by one of our members, Mr. Martindale, of University College Hospital. When the ordinary solution has been kept for some time, it becomes greatly altered in appearance; a myceloid growth rapidly forms and a brown matter is deposited, mixed with crystals. Analysis showed these latter to be the pure alkaloid without a trace of any acid. It is singular, also, that the solution of ammonium acetate decomposes and has eventually an alkaline reaction.

Those of us who have been accustomed to peruse the foreign publications must have painfully missed those from Paris. The horrid transactions and frightful display of human depravity, must have rendered scientific research impossible. We heartily sympathize with our Gallic brethren and reiterate the advice given by Horace to his friend Tibullus:—

"Inter spem curamque, timores inter et iras,
Omne crede diem tibi diluxisse supremum.
Grata superveniet, quæ non sperabitur, hora."

I must not, however, trespass longer upon your patience, although many things that have transpired during the past year might be profitably recalled to our memories. In the present day we, as Britons, must put forth our best energies, lest we fall into the rear of intelligent nations. Our young men are justly, though tacitly, making an urgent appeal for our help. We do not, of course, press them to join our ranks; but when they ask to be admitted and we do receive them, we are not doing the thing that is honest, if we fail to show the greatest solicitude for their welfare. The act of taking a pupil or apprentice is now one of very grave responsibility. When we sign an indenture we there and then become answerable for the proper education of that pupil, either by personal supervision or by securing the services of some substitute. Nay, I go further; my own impression is, that no one ought to take a pupil unless fully competent to answer most of the many questions that crop up in the mind of an earnest student, or else to show him how to get the desired information.

On the other hand, I think that a lad who has not received a good solid education, is not the one to be a Pharmaceutical pupil. His time then becomes too valuably occupied to be wasted in procuring the exceedingly little knowledge requisite for passing the Preliminary examination. We often hear it said that a youth has a good education because he is tolerably conversant with Colenso and Morell. This is a very common mistake. It is not education. Professor Huxley has justly reminded such an one, that reading, writing and arithmetic are only the means whereby we are enabled to open the educational casket.

I am fully conscious that I am addressing many to whom these remarks are superfluous, but the letters that appear from time to time in our Journal too plainly evince the deficiency to which I allude. We ought not to rest satisfied with the sandy foundation of semi-ignorance, but steadily persevere in building our intellectual structure on the rocky basis of observation and experience.

Appropriate food is as necessary for the mind as it is for the body. If we choose to feed our mental powers on the trashy material that is often miscalled literature, we cannot expect to have a healthy appetite for that which is good and worth remembering. What is it that prevents so many of us feeling a delight in the researches of others, or searching for ourselves? It is nothing less than mental dyspepsia and intellectual debility. Example is far better than precept, and we cannot expect our pupils to acquire a keen relish for mental cultivation, or believe it to be necessary, if they see that we ourselves care so little, and become so apathetic.

It is no drudgery or hard work that I recommend, but a pleasant relief from the monotonous routine of a chemist's life. The test-tube or the microscope, the herbarium or the pencil, will soon enough reward the trial with the substitution products of pleasurable surprise and wonder; for—

"Labour with what zeal we will,
Something still remains undone;
Something uncompleted still
Waits the rising of the sun."

I cannot conclude without allusion to the indefatigable exertions of our secretary, Dr. Attfield. Few of you know what a debt is owing to him for the completion of our first Year-Book. Unforeseen and unavoidable difficulties arose, that postponed its issue till late in the season; and it is to his indomitable *esprit de corps*, and the editorial ability of Mr. J. Ince, that we are mainly indebted for that volume. I am sure, therefore, that you will allow me, in your names, to thank them heartily and sincerely.

It only remains for me now, Gentlemen, to thank you for having a second time placed me in the honourable position of your President. May success crown your endeavours, and may the advancement of true pharmacy be the guiding star of the British Pharmaceutical Conference!

BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

The general opening Meeting of this Association took place on Wednesday evening in the Music Hall, George Street, Edinburgh. Professor Huxley, the retiring President, having thanked the Association for the kindness he had received during his term of office, vacated the presidential chair in favour of Sir William Thomson, who then proceeded to deliver the following Address:—

Address.

For the third time of its forty years' history the British Association is assembled in the metropolis of Scotland. The origin of the Association is connected with Edinburgh in undying memory through the honoured names of Robison, Brewster, Forbes, and Johnston.

In this place, from this chair, twenty-one years ago, Sir David Brewster said,—"On the return of the British

Association to the metropolis of Scotland I am naturally reminded of the small band of pilgrims who carried the seeds of this Institutien into the more genial soil of our sister land." . . . . "Sir John Robison, Professor Johnston, and Professor J. D. Forbes were the earliest friends and promoters of the British Association. They went to York to assist in its establishment, and they found there the very men who were qualified to foster and organize it. The Rev. Mr. Vernon Harcourt, whose name cannot be mentioned here without gratitude, had provided laws for its government, and, along with Mr. Phillips, the oldest and most valuable of our office-bearers, had made all those arrangements by which its success was ensured. Headed by Sir Roderick Murchison, one of the very earliest and most active advocates of the Association, there assembled at York about 200 of the friends of science."

The statement I have read contains no allusion to the real origin of the British Association. This blank in my predecessor's historical sketch I am able to fill in from words written by himself twenty years earlier. Through the kindness of Professor Phillips I am enabled to read to you part of a letter to him at York, written by David Brewster from Allerly by Melrose, on the 23rd of February, 1831:—

"Dear Sir.—I have taken the liberty of writing you on a subject of considerable importance. It is proposed to establish a British Association of men of science similar to that which has existed for eight years in Germany, and which is now patronized by the most powerful sovereigns of that part of Europe. The arrangements for the first meeting are in progress; and it is contemplated that it shall be held in York, as the most central city for the three kingdoms. My object in writing you at present is to beg that you would ascertain if York will furnish the accommodation necessary for so large a meeting (which may perhaps consist of above 100 individuals), if the Philosophical Society would enter zealously into the plan, and if the mayor and influential persons in the town and in the vicinity would be likely to promote its objects. The principal object of the Society would be to make the cultivators of science acquainted with each other, to stimulate one another to new exertions, and to bring the objects of science more before the public eye, and to take measures for advancing its interests and accelerating its progress."

Of the little band of four pilgrims from Scotland to York, not one now survives. Of the seven first Associates one more has gone over to the majority since the Association last met. Vernon Harcourt is no longer with us; but his influence remains, a beneficent and surely therefore never dying influence. He was a geologist and chemist, a large-hearted lover of science, and an unwearied worker for its advancement. Brewster was the founder of the British Association; Vernen Harcourt was its law-giver. His code remains to this day the law of the Association.

On the 11th of May last, Sir John Herschel died, in the eightieth year of his age. The name of Herschel is a household word throughout Great Britain and Ireland —yes, and through the whole civilized world. We, of this generation, have, from our lessons of childhood upwards, learned to see in Herschel, father and son, a *præsidium et dulce decus* of the precious treasure of British scientific fame. When geography, astronomy, and the use of the globes were still taught, even to poor children, as a pleasant and profitable sequel to "reading, writing, and arithmetic," which of us did not revere the great telescope of Sir William Herschel (one of the Hundred Wonders of the World), and learn with delight, directly or indirectly from the charming pages of Sir John Herschel's book, about the sun and his spots, and the fiery tornadoes sweeping over his surface, and about the planets, and Jupiter's belts, and Saturn's rings, and the fixed stars with their proper motions, and the double stars, and coloured stars, and the nebulæ discovered by the great telescope? Of Sir John Herschel it may indeed be said, *nil tetigit quod non ornavit.*

A monument to Faraday and a monument to Herschel, Britain must have. The nation will not be satisfied with anything, however splendid, done by private subscription. A national monument, the more humble in point of expense the better, is required to satisfy that honourable pride with which a high-spirited nation cherishes the memory of its great men. But for the glory of Faraday or the glory of Herschel, is a monument wanted? No!

"What needs my Shakespere for his honoured bones
The labour of an age in pilèd stones?
Or that his hallowed reliques should be hid
Under a star-ypointing pyramid?
Dear son of memory, great heir of fame,
What need'st thou such weak witness of thy name?
Thou, in our wonder and astonishment,
Hast built thyself a live-long monument.
* * * *
And, so sepúlchred, in such pomp dost lie,
That kings for such a tomb would wish to die."

With regard to Sir John Herschel's scientific work, on the present occasion I can but refer briefly to a few points which seem to me salient in his physical and mathematical writings. First, I remark that he has put forward, most instructively and profitably to his readers, the general theory of periodicity in dynamics, and has urged the practical utilizing of it, especially in meteorology, by the harmonic analysis. It is purely by an application of this principle and practical method that the British Association's Committee on Tides has, for the last four years, been, and still is, working towards the solution of the grand problem proposed forty-eight years ago by Thomas Young in the following words:—

"There is, indeed, little doubt that, if we were provided with a sufficiently correct series of minutely accurate observations on the tides, made not merely with a view to the times of low and high water only, but rather to the heights at the intermediate times, we might form, by degrees, with the assistance of the theory contained in this article* only, almost as perfect a set of tables for the motions of the ocean as we have already obtained for those of the celestial bodies, which are the more immediate objects of the attention of the practical astronomer."

Sir John Herschel's discovery of a right or left-handed asymmetry in the outward form of crystals, such as quartz, which in their inner molecular structure possess the helicoidal rotational property in reference to the plane of polarization of light, is one of the notable points of meeting between natural history and natural philosophy. His observations on "epipolic dispersion" gave Stokes the clue by which he was led to his great discovery of the change of periodic time experienced by light in falling on certain substances and being dispersively reflected from them. In respect to pure mathematics, Sir John Herschel did more, I believe, than any other man to introduce into Britain the powerful methods and the valuable notation of modern analysis. A remarkable mode of symbolism had freshly appeared, I believe, in the works of Laplace, and possibly of other French mathematicians; it certainly appeared in Fourier, but whether before or after Herschel's work I cannot say. With the French writers, however, this was rather a short method of writing formulæ than the analytical engine which it became in the hands of Herschel and British followers, especially Sylvester and Gregory (competitors with Green in the Cambridge Mathematical Tripos struggle of 1837), and Boole and Cayley. This method was greatly advanced by Gregory, who first gave to its working-power a secure and philosophical foundation, and so prepared the way for the marvellous exten-

* Young's; written in 1823 for the Supplement to the 'Encyclopædia Britannica.'

sion it has received from Boole, Sylvester and Cayley, according to which symbols of operation become the subjects not merely of algebraic combination, but of differentiations and integrations, as if they were symbols expressing values of varying quantities. An even more marvellous development of this same idea of the separation of symbols (according to which Gregory separated the algebraic signs + and − from other symbols or quantities to be characterized by them, and dealt with them according to the laws of algebraic combination) received from Hamilton a most astonishing generalization, by the invention actually of new laws of combination, and led him to his famous "Quaternions," of which he gave his earliest exposition to the Mathematical and Physical Section of this Association, at its meeting in Cambridge in the year 1845. Tate has taken up the subject of quaternions ably and zealously, and has carried it into physical science with a faith, shared by some of the most thoughtful mathematical naturalists of the day, that it is destined to become an engine of perhaps hitherto unimagined power for investigating and expressing results in natural philosophy. Of Herschel's gigantic work in astronomical observation I need say nothing. Doubtless a careful account of it will be given in the 'Proceedings of the Royal Society of London' for the next anniversary meeting.

In the past year another representative man of British science is gone. Mathematics has had no steadier supporter for half a century than De Morgan. His great book on the differential calculus was, for the mathematical student of thirty years ago, a highly-prized repository of all the best things that could be brought together under that title. I do not believe it is less valuable now; and if it is less valued, may this not be because it is too good for examination purposes, and because the modern student, labouring to win marks in the struggle for existence, must not suffer himself to be beguiled from the stern path of duty by any attractive beauties in the subject of his study?

One of the most valuable services to science which the British Association has performed has been the establishment, and the twenty-nine years' maintenance of its Observatory. The Royal Meteorological Observatory of Kew was built originally for a sovereign of England who was a zealous amateur of astronomy. George III. used continually to repair to it when any celestial phenomenon of peculiar interest was to be seen; and a manuscript book still exists filled with observations written into it by his own hand. After the building had been many years unused, it was granted, in the year 1842, by the Commissioners of Her Majesty's Woods and Forests, on application of Sir Edward Sabine, for the purpose of continuing observations (from which he had already deduced important results) regarding the vibration of a pendulum in various gases, and for the purpose of promoting pendulum observations in all parts of the world. The Government granted only the building, no funds for carrying on the work to be done in it. The Royal Society was unable to undertake the maintenance of such an observatory; but, happily for science, the zeal of individual Fellows of the Royal Society and members of the British Association gave the initial impulse, supplied the necessary initial funds, and recommended their new institution successfully to the fostering care of the British Association. The work of the Kew Observatory has, from the commencement, been conducted under the direction of a Committee of the British Association; and annual grants from the funds of the Association have been made towards defraying its expenses up to the present time. To the initial object of pendulum research was added continuous observation of the phenomena of meteorology and terrestrial magnetism, and the construction and verification of thermometers, barometers, and magnetometers, designed for accurate measurement. The magnificent services which it has rendered to science are so well known that any statement of them which I could attempt on the present occasion would be superfluous. Their value is due in a great measure to the indefatigable zeal and the great ability of two Scotchmen, both from Edinburgh, who successively held the office of Superintendent of the Observatory of the British Association—Mr. Welsh for nine years, until his death in 1859, and Dr. Balfour Stewart, from then until the present time. Fruits of their labours are to be found all through our volumes of Reports for these twenty-one years.

The institution now enters on a new stage of its existence. The noble liberality of a private benefactor, one who has laboured for its welfare with self-sacrificing devotion unintermittingly from within a few years of its creation, has given it a permanent independence under the general management of a Committee of the Royal Society. Mr. Gassiot's gift of £10,000 secures the continuance at Kew of the regular operation of the self-recording instruments for observing the phenomena of terrestrial magnetism and meteorology, without the necessity for further support from the British Association.

(To be continued.)

Parliamentary and Law Proceedings.

HOUSE OF LORDS.

Petroleum Bill, *July* 26.—On the third reading of this Bill—

The Earl of Morley proposed an amendment, reducing the standard from 85° F. to 80° F. This he explained was consistent with safety, as the test would be made in a closed vessel, whereas it was at present made in an open vessel, and very variable.

Lord Cairns opposed the amendment, which was strongly objected to by the Metropolitan Board of Works.

The Earl of Morley, in deference to the noble and learned lord's objection, and in consideration of the late stage of the Bill, withdrew the amendment.

The Bill then passed.

HOUSE OF COMMONS.

Adulteration of Food, Drink and Drugs.—*July* 31.—Lord Eustace Cecil gave notice that, failing the action of the Government to bring in a measure to amend the law relating to the adulteration of food, drink and drugs, or to introduce clauses for that purpose in any sanitary Act which they may propose, he would, early next Session, again propose a resolution upon the subject for the consideration of the House.

Fatal Mistake at a Surgery.

An inquest was held at the Royal Exchange, Aston, on Thursday, July 27th, before Mr. W. S. Poole, coroner, on view of the body of a bricklayer's labourer, named Bullock. It appeared that a month ago deceased had fallen from a building upon which he was at work, and had fractured his ribs. He was attended by Mr. Hoare, surgeon. Deceased had so far recovered as to be able to walk from home, and on Wednesday morning had gone to the surgery of Mr. Hoare, and was given by Mr. Hoare a preparation called "linctus" for a cough, and another, a liniment, for external application. The latter mixture contained a deadly poison,—aconite,—and the deceased went on Wednesday morning (as mentioned above), taking with him his linctus bottle for the purpose of getting some more of the mixture. Unfortunately he did not see Mr. Hoare, but an assistant named Hunter, a young man about twenty years of age, who, instead of giving the linctus, gave the liniment. Bullock carried it home, and before the mistake was discovered had taken a dose, and two hours afterwards died. The inquiry is adjourned for a *post-mortem* examination to be made, and an analysis of the stomach.—*Aris's Birmingham Gazette.*

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Seeing *versus* Feeling and Hearing.

Sir,—I most cordially agree with the remarks made by your correspondent, Mr. M. J. Ellwood, in his letter published in the Journal of the 22nd inst. Respecting the addition of bells to bottles containing active poisons, a greater absurdity I scarcely thought a chemist would suggest. It is quite evident "Alarm Bell" (who suggested the addition of the bell) is not accustomed to an extensive dispensing or even a country trade, or he would have known that it is utterly impracticable. It may look exceedingly well, and do to show to his few customers what little confidence he has in himself or those about him. Allow me to inform him that in country towns the greater part of the business of the week has to be done in a few hours, and that country chemists have by far a greater number of prescriptions to dispense on the market days than all the rest of the week put together. And how pleasant for a nervous patient waiting whilst a prescription was being made up, on making the inquiry what that tinkling noise is on the tinct. opii, strychnia, or prussic acid bottle being touched, to be informed they contained poison! It would be sufficient, I imagine, to frighten such a person out of the shop. India-rubber bands, I am of opinion, would in a few weeks be entirely useless; and the india-rubber cap on market days would in all probability be thrown on one side till the throng was over. I would ask if the public has made any demand for regulations in the keeping and storing of poisons in chemists' shops? I have not yet been able to learn that they have, and it really looks very childish for an educated class of men like the chemists of the present day, to ask to be hampered with a set of regulations which would be of little use to those asking for them, who would, in all probability, be the first to break the law. Nothing can surpass or even equal those arrangements of poisons adopted by the proprietors of such establishments, for it is to their advantage to place them in such a position that they cannot be mistaken for some innocuous drug or compound, especially with Lord Campbell's Act hanging over their heads. I would suggest that every chemist should purchase a copy of that Act, and place it in a conspicuous place in the dispensing department of his establishment. Regarding the bottles before the trade for dispensing liniments, lotions, etc., a more unsightly and useless bottle I never saw than the "corrugated," without even a place to put on a label. The bottle I have adopted for some years now for liniments, lotions, etc. is the "fluted," made by the York Glass Company, which I have found to answer exceedingly well. But then I have had them brought for sweet nitre, almond flavour, etc., and when I represented what use the bottle was intended for, they wished to have what they required in the bottle, as it was such a nice one.

If those who have signed Mr. Sandford's letter have so little confidence in themselves, let them be under inspection by all means; but do not ask a respectable and great body of traders numbering some thousands, in whom the public has every confidence, to be subject to such an indignity. Surely the trade is not to be under the thumbs of Messrs. Sandford, Simon and Co.; or where has that privilege gone which hitherto has been an Englishman's boast—"liberty"? I do hope we have heard the last about the sale, storing and dispensing of poisons; and that the chemists of this country, who labour so long day after day, and are so poorly paid for their services to the public, will be allowed to carry on their business for the future in peace and quietness.

Hull, July 27th. Chas. B. Bell.

The Pharmacy Bill.

Sir,—It is surprising how prejudice and passion can blind the eyes even of large bodies of men, especially when these are aroused by selfish ideas of interest. I had not the honour of signing the letter addressed to members of Parliament printed in yours of the 22nd, but it has my hearty concurrence, and I shall use what little influence I may possess to thwart the ill-timed and ill-advised action of misguided men, who are factious agitators rather than members of an intelligent majority. I will not argue the question, for men who have written and acted as the opponents of the Pharmacy Bill are at present wholly insensible to argument or reason, for it would be like flaunting a red rag to a mad bull,—only infuriate them the more. They may have succeeded in stifling right feeling and calm judgment for the time, just as the manufacturers of Pennsylvania have imposed protection against the interests of America. So these short-sighted men are imposing a retrograde movement to the detriment of the best interests of the trade. But this will not last; "men will awaken;" the tyranny of petty dictators of the demagogue class, who have lately ruled the elections, and obtained a temporary majority, will be overcome. The calm sense of the Society will assert its supremacy, and we shall live to wonder that in the year of grace 1871 there could have been found amongst us obstructives as stupid as those who have opposed this Bill.

Because other nations are not free traders, therefore we will not have free trade, is an exploded argument. It is the same as saying, because medical men who keep open shop are not to be placed at once under these wise regulations, recommended by the whole Society for voluntary adoption, therefore we will not have them for chemists' shops.

If the regulations were wise,—and their adoption proves that the Society considers them so,—we should advocate their compulsory enforcement on all vendors of drugs, and include medical men, rather than say because we cannot achieve immediate and complete success therefore we will idly and negligently refrain from attempting any whatever.

I trust Mr. Sandford will not be swayed from his principles of duty by the senseless tirade against him. The approval of his conscience and judgment will shield him from these ungenerous attacks; and such terms as "treason," "treacherous," etc., will only recoil with tenfold force upon men who deserve the censure they give, and which the future will fix upon them.

Plymouth, July 29th, 1871. F. P. Balkwill.

Sir,—The desire expressed by you that agitation on the question of poison regulations should cease, after the withdrawal of the Pharmacy Bill from the present session, has evidently not been gratified. Now, although I have no wish to foster a spirit of antagonism in our Society, I must be permitted to say something in answer to your correspondents who have exercised their undoubted right of criticizing my conduct on this occasion.

A new light seems to have broken in on Mr. Schacht, who thought that chemists were all of one mind in reality, and all believed "each individual member of their fraternity to be competent to frame all requisite precautions for the safety of the public and the security of his own means of living." Did it never occur to Mr. Schacht that men may be competent and yet at the same time unwilling or indifferent? Does he not know that even in his own district a score of persons dealing in poisons may be found who take no precaution whatever, who keep tincture of opium and tincture of rhubarb side by side on their shelves, with no more difference than the ordinary label? Does he suppose that those gentlemen who framed regulations, and for two years upheld their imposition, deemed them unnecessary? And, again, does he not know that Mr. Forster over and over again stated that if compelled by want of time to withdraw the Bill this session, another would be introduced at the opening of next year; and that the general feeling of members of Parliament was that the Pharmaceutical Society had failed in its duty in not proposing compulsory regulations?

I regard "the success of the opposition," with which Mr. Reynolds opens, as nothing more than that transient success which often attends men who are prepared to talk against time; and I therefore feel that in the best interests of the Society, both those who deem regulations necessary and those who believe they will be forced on us, would do better to perfect those regulations, than to stultify themselves by saying, "we admit these rules to be good and practically adopt them, but will not recognize their universal establishment." I think in a former letter Mr. Reynolds said it would be illogical to accept the code even as "recommendations," if we declined to make it compulsory. He was perfectly right. I do not claim the sole honour assigned to me by Mr. Reynolds of issuing the circular to which I invited and received the signatures, and it would, perhaps, astonish him to read at least a hundred letters of most hearty concurrence which I have in my possession. He asks why I gathered together the names of about one hundred and twenty chemists. Simply because their names were at hand in the published list of local secretaries, and they had, many of them, sent petitions to Parliament against the original Bill. I deemed it right that these men should be put in full possession of the amendments to be proposed by Mr. Forster. Had time permitted, Mr. Reynolds knows well enough that I should have endeavoured, by the ordinary means set down in our bye-laws, to obtain a general meeting at which these amendments might have been fairly discussed.

Mr. Reynolds does sometimes indulge in hard words, and, "*speaking advisedly*," he says "the circular *dishonestly* assumes that its promoters were persons who recognized the faults of the original Bill." Having drawn a long bow for this insinuation, he naturally thinks of a "*treacherous arrow*"!

I forget whether Mr. Reynolds was present at the first Council meeting at which the Pharmacy Bill was discussed; if he was he may remember, and if he was not he may ascertain from those who were, that I was the very first person who drew attention to the objectionable part of the Bill, and that I was commissioned by my colleagues to communicate with the Privy Council and endeavour to obtain amendments. I can go even a little further than this and tell Mr. Reynolds that every amendment in the Bill was conceded most fully and fairly by the Privy Council, *with the approval of Mr. Simon*, on the representations of those gentlemen who went with me to amend, and not at the instigation of the opponents.

Having gone aloft on his arrow and gazed "with sorrow" (a little surprise also, perhaps) on the names of his adversaries, Mr. Reynolds deposits us in a "new cave of Adullam"; probably he would prefer the cave of Makkedah, for security's sake, for the names of good men and true, men long known to their brethren as zealous and faithful friends of the Pharmaceutical Society, appear on that honourable roll, and will still command the confidence and goodwill of their fellow-members, notwithstanding the charge of "*treason*" preferred against them by Mr. Schacht.

Sir, when I look back to the narrow majority which the non-regulationists obtained at the annual meeting, I think we may still claim to represent our constituents, and I pass by, as unworthy of notice, the charge of Mr. Reynolds that I am seeking "*by most questionable means and equally questionable allies*" to enforce my wishes.

I know Mr. Reynolds has strong views about representative government, and I know that he was the first to introduce electioneering tactics into our Society; a course of conduct which has deprived our Council of some of its best blood, and threatens to set up a state of intolerable terrorism, if we may judge by the correspondence which appeared in your columns last week between the Secretary of the "Chemists' Defence Association" and two members of Council.

I will only point to one other subject, because it is one on which a good deal of nonsense has been talked. Mr. Wade says he sees among the signatures the names of persons who formerly "*protested against any check that did not emanate from the brain.*" What can he mean by this? Is not the sense of touch as much a servant or sentinel of the brain as the sense of sight? And is it beneath the dignity of the brain to have impressions conveyed to it through the fingers? I commend 'Bell on the Hand' to Mr. Wade's careful perusal.

I am, Sir,

George W. Sandford.

47, *Piccadilly, August* 2, 1871.

Sir,—I rejoice with the majority of our fraternity that the Amended Pharmacy Bill has fallen (let us hope for ever). The Pharmacy Act of 1868 was pointed out by our great guns to confer immense advantages on the trade, instead of which it proves a snare; and in consideration of the innumerable advantages derived from that invaluable Act we were to be screwed down a little tighter. But, thanks to our Defence Associations, we have proved ourselves equal for the occasion. If it suits the fancy of a few West-End stars to erect elaborate poison cupboards, etc. etc., well and good; a very pretty ornament, no doubt; but let those alone who have no such mania; and, perhaps, in many cases cannot afford the expense of such useless furniture.

Having had some years' experience in good houses in different parts of the country, I can fully enter into the feelings of our provincial brethren in so strenuously opposing the Bill, knowing it to be utterly impossible (particularly in agricultural districts) to conform to such regulations, even were they proved necessary. I therefore trust, should occasion require, we shall be found ready to defend our rights against the caprice of 120 elects.

Islington. W. N. G. L.

[The following additional correspondence between Messrs. Smith and Hampson has been forwarded to us by those gentlemen, with a request for its publication. Mr. Smith has called our attention to certain orthographical errors in one of Mr. Hampson's letters to him, which errors likewise occur in the copy received by us. The letters are therefore printed exactly as forwarded to us by each gentleman. In the copies forwarded by Mr. Smith, the letters of Mr. Hampson are preceded by a list of the officers and committee of the Chemists' Defence Association.—Ed. Pharm. Journ.]

(Copy.)

"*The Chemists' Defence Association,*
"63, *Piccadilly, Manchester, July* 25*th*, 1871.

"Sir,—I am obliged for the prompt acknowledgment of my note, and, as your reply contains several important misconceptions, it is necessary for me to trouble you with another letter.

"Let me, in the first place, disabuse your mind of the mistaken notion that the Chemists' Defence Association has assumed any kind or degree of authority over the members of the Pharmaceutical Council, such authority resting only with the constituents. It has not, therefore, attempted to exercise any authority over you; neither has the Association presumed to call upon you to resign your seat at the Council. The letters I have written to Mr. Carr as well as to you are my own personal acts, and in no way authorized by the Association. I am at a loss to discover in my letter the imperious tone of which you complain.

"I simply call your attention to statements in reference to your nomination, about which, viewed in the light of your subsequent action, there hangs an unpleasant mystery.

"Your friend Mr. Carr vouched for your opinion in his letter of March 14, 1871, on the question of the hour, hence your name was included on the popular list, and this undoubtedly conduced to your election.

"Can you wonder that there is much astonishment and some indignation manifested by many members of the Society who voted for you, when they found you voting in a most unexpected and incomprehensible manner, and directly opposed to the views they presumed and believed you entertained?

"If, with others, I have been so erroneously attributing to you 'a change of opinion respecting poison regulations,' it is a very pardonable mistake, when I had the authority of Mr. Carr's letter implicitly fixed on my mind.

"The only moral that I and others may gain from this unpleasant experience is, that when the prosperity and safety of the Pharmaceutical Society and the freedom of the trade are at issue, it will be well, at any future election, to be certain of the sentiments of those who are to be entrusted with the power of representation.

"I am, Sir, your obedient servant,

"Robert Hampson,

"E. Smith, Esq. "*Hon. Sec.*"

(Copy.)

"8, *The Strand, Torquay,*
"*July* 28*th*, 1871.

"Sir,—Your letter of the 25th inst. reached me only yesterday the 27th, just as I was leaving home, and I did not return in time to reply the same day.

"I cannot but express my great surprise to find that your letter of the 21st was 'your own personal act, and in no way authorized' by the Chemists' Defence Association. It seems to me that this is a very awkward way out of a very awkward position.

"The very first paragraph of your former letter distinctly says, 'the members of the Chemists' Defence Association have expressed surprise and indignation;' moreover, the words Hon. Sec. are attached to your signature. Surely, had the letter not been intended as an official document, there could have been no meaning in attaching these words to your name nor in heading your letter with 'the Chemists' Defence Association,' as well as with a list of executive committee; neither could there have been the smallest necessity for saying a word concerning the surprise and indignation of the members of your Association.

"It is not difficult to see that if I had been constituted of that plastic material of which dummies and delegates are commonly made, the Chemists' Defence Association would have proved itself pretty identical with its Hon. Sec.; but now, the Association finding itself in a false and untenable position, is anxious to place the onus of its false step on the shoulders of its unfortunate Hon. Sec.

"Need I point out, Sir, how neatly you have impaled yourself on the horns of a dilemma? Either your former letter was authorized by your Association or it was not. If the affirmative be true, then you stand convicted by your second letter; but if the negation be true, then as an honourable man and a gentleman you are bound promptly to withdraw the letter, with its misleading official appendages, and tender a suitable apology.

"I must remind you that I before refused to enter into correspondence, simply because you were acting as the representative of an Association having no authority, and consequently no *locus standi*, and for this very same reason I am still unable to correspond with you touching the other matters alluded to in your letters, so long as the words Hon. Sec. are appended to your name, or your communications headed with a list of some self-constituted committee.

"I again repeat my readiness and willingness to reply to any courteous communication from any gentleman.

"This correspondence will be published.

"Yours,

"EDWARD SMITH.

"R. HAMPSON, Esq., *Hon. Sec. to the "Chemists' Defence Association."*

"*The Chemists' Defence Association,*
"63, *Piccadilly, Manchester, July 29th*, 1871.

"Sir,—The false issue you attempt to raise in your letter of the 28th inst. is both evasive and irrevelent, and is scarcely worthy of notice.

"I distinctly affirm in my preceeding letter that this correspondence is strictly unofficial, or, in other words, that I have not been instructed by the Executive Committee either to begin or carry on this correspondence. Yet, to suit your own special purpose, you impugn the veracity and honour of the Executive Committee of the Chemists' Defence Association, and likewise my own, by calling in question my affirmations.

"I shall not reaffirm my statements, as it is of very little consequence whether you beleive or doubt them.

"In nearly all my correspondence in reference to matters pertinent to poison regulations I have used the printed notepaper headed with a list of the Executive Committee, and have signed myself Hon. Sec. Hence I used the same notepaper in writing to you.

"It is likewise *certainly true* that 'the members of the Chemists' Defence Association, *and those generally* who have opposed the enactment of further compulsory poison regulations, *have* expressed much surprise and some indignation at the support you have given to the members of the Pharmaceutical Council who are in favour of further legislative enactments of a restrictive character.'

"I simply stated this fact with others; as, for instance, the guarentee your friend Mr. Carr gave for your opinions on the poison regulation question, and your consequent appearance with him on the successful list, as an excuse *sufficient* for troubling you with my letter of July 21st.

"It appears, however, useless to continue this correspondence, as you are not disposed to give a gentlemanly credence to my statements; and as you show no willingness to assign any reason for voting contrary to the just expectations of the majority of the constituents who returned you to represent them on the Pharmaceutical Council at a most important crisis, I shall not therefore reply to any further communication you may make.

"I am, Sir, your obedient servant,

"ROBT. HAMPSON, *Hon. Sec.*

"E. SMITH, Esq."

(COPY.)

"8, *The Strand, Torquay, July* 31, 1871.

"Sir,—I have this morning received your note of the 29th.

"Yours,

"EDWARD SMITH.

"R. HAMPSON, Esq., *Hon. Sec.*
"*Chemists' Defence Association, Manchester.*"

THE COUNCIL OF THE NORTH BRITISH BRANCH OF THE PHARMACEUTICAL SOCIETY.

Sir,—Although very much occupied with the arrangements connected with the approaching Conference meeting here, I feel it would be unjust to myself and others did I not reply to a letter which appeared in your Journal on Saturday last, from Mr. Fairlie, of Glasgow, headed "The Council of the North British Branch of the Pharmaceutical Society."

I am the more disposed to notice this communication because I find something like a threat, or at all events a hope expressed, that at some future time the constitution and history of this Council may be discussed.

I understand that your correspondent has not been many months a member of the Pharmaceutical Society, which, to my mind, explains much of what he has stated; for, had it been otherwise, he must have observed, for many years past, that an Annual Meeting of the Society has taken place in Edinburgh, at which a Report from this very Council was read, approved, and sent to London for publication. At the same time, by the decision of these meetings, composed of town as well as country members, the Council for the next year was duly elected, as well as the other office bearers of the Society in Edinburgh. If Mr. Fairlie will take the trouble to obtain sight of a few of the back volumes of our Journal, he will find, usually in the May number, an account of those meetings, and a list of the gentlemen composing the Council, from which he will observe, that the oldest and best known pharmacists are among the number; and although we have, as he will see, been honoured more than once by the presence of some of our Glasgow friends at these very meetings, our regret has always been, that we have failed to induce more of our country friends to be present.

One word as to the origin of "the high-sounding title." In 1852, when the Pharmacy Act passed, there was a clause giving Edinburgh an examining body, with the same power and privileges as the examiners in London,—a fact which will be made apparent on reference to the proceedings already referred to, for one portion of the business each year was to nominate the members of the Board of Examiners in Edinburgh, and these were forwarded to London for confirmation by the Privy Council. The names comprising this Board will speak for themselves. At the time of the passing of this Act, and to enable the new machinery to be fairly set a-going, the late Mr. Jacob Bell very kindly paid Scotland a visit, and it was at his suggestion that the Council was elected, the name bestowed, and the operation of the North British Branch ever since continued. A museum and library have both been in existence since then, and belong to the parent Society, while the Council referred to have had funds regularly sent from London, with which to carry on the business of the Society in Edinburgh. In other words, the North British Branch of the Society here has always had a different position to that of any other local association in England, Scotland, or Wales, and will, I hope, continue to do so.

Pharmaceutically, Glasgow has been for many years asleep, and no one rejoices more than I do at the awakening which has taken place; and from whatever cause this has arisen, I can honestly say, go on and prosper. But, with all due deference to the energetic secretary of the West of Scotland Defence Association, I must ask him not to censure or insinuate where there is no real foundation for doing the one or the other. As previously stated, the name of the local Council here has been long known and its existence understood; and it must be distinctly remembered that there was no pretence made to mislead in regard to the opinion of this Council as to the poison regulations, beyond what was expressed in the minute, a copy of which, at the request of the meeting, I simply sent to London. JOHN MACKAY, *Hon. Sec.*

Edinburgh, July 31*st*, 1871.

H. Fölker.—There is little doubt that, as you suggest, the word is a misspelling of "Origanum."

A. Pickering.—We have received your letter, but we are unable, from want of space, to insert the communications of private individuals with Members of Parliament.

COMMUNICATIONS, LETTERS, etc., have been received from Dr. Procter, Mr. J. Borland, Mr. Fairlie, Mr. M. C. Cooke, Mr. Dymond, Mr. Leay, Mr. G. Harvie, Mr. W. H. J. Shaw, Mr. H. J. Walker, Mr. J. T. Jones, Mr. R. Newall, Mr. J. Thompson, Mr. J. J. Thomas, Mr. R. W. Giles, W. N. G. L., W. F. C., G. R. C., "Gramme."

THE PARIS SCHOOL OF PHARMACY.

BY WALTER HILLS.

In pursuing my short sketch of the School of Pharmacy in Paris I come now to the lectures, which are very numerous, and generally well attended. Although the admission is entirely free, as far as I was able to judge, very few besides the regular students in pharmacy availed themselves of this privilege, arising probably from the fact that the generality of knowledge seekers prefer the lectures given at the "Sorbonne," or the "Collége de France," where the range of study is more extended. For example, I find at the latter institution the following list for one day:—

Vendredi.

9 heures. Langue et littérature française du moyen âge.
10 heures. Philologie et archéologie égyptienne.
10 heures. Mécanique céleste.
10 h. ½. Physique générale et expérimentale.
11 heures. Economie politique.
Midi. Physique générale et mathématique.
Midi ½. Histoire de la médecine.
Midi ½. Langue et littérature grecque.
Midi ½. Histoire des législations comparées.
1 heure. Chimie organique.
1 heure. Médecine expérimentale.
1 h. 5. Langue turque.
2 heures. Histoire naturelle des corps inorganiques.
2 heures. Philosophie grecque et latine.

But to return to the less extended pleasure-grounds of the School of Pharmacy, we find that there are two lecture theatres, a larger of a semicircular shape, and seating perhaps 200 students, and a smaller, rectangular, capable of accommodating 100 or 150. In the first *semestre* of the student's year, the lectures are three per week of each of the following subjects:—

Physics. M. Buignet.
Inorganic Chemistry. M. Riche (agrégé of M. Bussy, director of the school).
Galenical Pharmacy. M. Chevallier.
Zoology. M. Milne-Edwards.
Materia Medica. M. Planchon.

In the second *semestre*, there are every week three of the following:—

Toxicology. M. Bouis.
Botany. M. Chatin.
Organic Chemistry. M. Berthelot.
Pharmacy (chemical division). M. Lecanu.

During the latter, which is the summer session, there are also herborizations about every other Sunday, in which any one may join. The rendezvous for these is generally at one of the railway stations at 7 or 8 o'clock A.M., or even earlier, and the professor of botany then accompanies the party to a district which he knows to be at that season particularly rich in plants of pharmaceutical interest. On some occasions this may be twenty or thirty miles out of Paris; but the railway companies grant tickets at a greatly reduced charge, so that it is not so great an expense as would appear at first sight.

It will be seen that the lectures are not deficient in number; and in quality, as far as I am able to form an opinion, they are excellent. I find that those on physics and botany extend over two sessions, and I must speak very highly of the former which are delivered so ably and fully by M. Buignet, whose course on magnetism and acoustics I had the pleasure and privilege of attending. M. Chatin treats of structural and physiological botany in the first session, and of systematic botany (taking the whole of the Natural Orders) during the second.

Before concluding, I would draw attention to the great importance attached by the French professors of pharmacy to the subject of toxicology, to which, as may be seen, a whole course of some twenty-five to thirty lectures is entirely devoted. I believe that in France the *pharmacien* is generally regarded as the man from whom scientific aid is to be sought in all cases of poisoning, adulterations of food, etc., from the fact that he combines with pharmacy the study of chemistry proper; and I hope that the time will come when in England pharmaceutists, as a body, will in this respect merit their still higher title of "chemist," and that each member of our profession will be looked upon in his own town or village as the best authority in cases requiring analytical research. I think that the medical man who now often comes in for this work would gladly relinquish that which must sometimes interfere with his professional duties, and the chemist, with his apparatus and reagents always ready, might make this branch of his business in some degree lucrative, as well as a highly interesting study to himself and an advantage to his neighbours.

ETHEREAL SOLUTION OF QUINIA.

BY CHARLES RICE.

An ethereal solution of quinia has for several years been quite frequently prescribed by prominent physicians in Philadelphia and elsewhere, and I have been often requested, especially by physicians in the country, to furnish them a formula for its preparation. Although the different steps of the preparation are simple enough, yet I have repeatedly been informed of failures in the hands of others. In order to furnish to those who are not practical pharmaceutists or chemists, and also to those who have met with ill success, a formula for its preparation, I shall give below the full detail, which will enable any one to prepare it for himself.

The object of the solution is to administer the alkaloid subcutaneously, in which case a much smaller dose is required, and a more speedy action is obtained than when administered internally. The idea of the subcutaneous use of quinia naturally suggested itself to practitioners from the previous similar administration of other alkaloids, especially morphiæ sulphas; but the neutral sulphate of quinia not being soluble to any useful extent in water, and the use of an acid solution being accompanied by pain and often severe inflammation, it was necessary to employ the pure alkaloid. And, of all the different solvents, ether seems to have found the most favour.

By the way, I would remark that the practice of some apothecaries of using dilute sulphuric acid in their solution of morphiæ sulphas is highly reprehensible and denounced by physicians, on account of the pain and inflammation following its hypodermic use; water being all that is necessary.

Most authorities state that 1 part of quinia requires 60 parts of ether for its solution. This statement is quite correct, as far as the solution of the *dry* alkaloid is concerned, and it is by no means easy to prepare a solution even of that strength. But we may readily dissolve the quinia in ether, either at the moment of its precipitation from one of its salts, or at all events while yet in a moist state. The ethereal solution thus obtained may be concentrated to such a strength, that 2 minims of it will contain 1 grain (and even more) of quinia, although in this state the solution is too thick for use, and too liable to solidify. Hence quinia (recently precipitated and yet moist) may be said to be soluble in ether in all proportions, as has been stated already by Bussy and Guibourt (*Journal de Pharmacie et de Chimie*, vol. xxii. 1852, pp. 413, 414).

The strength of the ethereal solution, as employed by many practitioners, is such that 5 minims contain 1 grain of quinia.

Preparation.—Take 364 grains of sulphate of quinia, which has been (previously to weighing) deprived of its water by drying it at 212° F., mix it with 1 pint of water, and add to it just sufficient dilute sulphuric acid to dissolve it. Filter if necessary, and wash the filter carefully. Introduce the solution into a 4-pint bottle, and add sufficient water to make it measure 32 oz. The next step is to precipitate the quinia, and in order to avoid too great an excess of aqua ammoniæ, it is best to make a preliminary trial of the dilute sulphuric acid and aq. ammoniæ to be employed in the process. Introduce into a graduate 1 fl. oz. of the dilute acid, add some strips of litmus paper, and, while stirring, drop in very gradually from another graduate (or burette) aqua ammoniæ, until the litmus paper turns blue. The amount of aq. ammoniæ used is the quantity necessary to saturate 1 fl. oz. of the acid. Now pour upon the solution in the 4-pint bottle a little more than *double* the amount of aqua ammoniæ, corresponding to the amount of diluted sulphuric acid used, in order to precipitate the quinia; for it is not only necessary to neutralize the amount of acid added, but also the other equivalent already contained in the original sulphate of quinia. Immerse the bottle in ice-cold water to absorb the heat generated during precipitation. Have a sound and tightly-fitting cork ready, through which are passed two narrow glass tubes, one of them nearly reaching to the bottom of the 4-pint bottle, the other just penetrating the cork, and both cut off at an even height on the upper side. When the bottle has been sufficiently cooled, pour into it 15 fl. oz. of stronger ether, and shake; the quinia will be dissolved, and the contents of the bottle will arrange themselves in two transparent layers, the lower one an aqueous solution of sulphate of ammonia (holding a little ether and also a trace of quinia in solution), and the upper one an ethereal solution of quinia. Introduce the cork into the mouth of the bottle, keeping the finger on the orifices of the glass tubes, and invert the bottle. Hold it for a short time in a somewhat inclined position, to allow the watery solution adhering to the sides and bottom to drain down into the lower layer; then remove the finger, and allow the lower layer to flow off into a vessel placed below. As soon as the line of demarcation approaches the cork, allow the liquid to pass only very gradually, and, as soon as all the aqueous solution has run off, receive the ethereal solution in a 16-oz. graduate. Rinse the bottle with ½ fl. oz. of ether, and add it to the former. Allow the ethereal solution to evaporate in a warm place (110°–120° F.), until reduced to 2½ fl. oz. Remove it, cover it well to prevent further evaporation, and cool it to the temperature of 60° F. Then measure off into a weighed graduated tube (or minim graduate) 5 minims, and evaporate to dryness. Should there be no scales sufficiently accurate to indicate fractions of a grain, use an aliquot multiple of 5 minims, such as 50 minims, in which case, of course, you will have to divide afterwards again by 10. There will probably be found more than 1 grain of quinia contained in the 5 minims; hence it is now only necessary to dilute it with ether to the required strength. Let us suppose that the residue of 5 minims weighed 1¼ grains, and that our remaining solution measures 2½ fl. oz.; now in order to make the solution contain 1 grain in every 5 minims, we have the proportion:—

1 (grain req.): 1¼ (grains found) $=$ 2½ (fl. oz.): x (fl. oz. req.) whence $x = 3\frac{1}{8}$ (fl. oz.); hence we have to dilute the solution with stronger ether so as to measure $3\frac{1}{8}$ fl. oz.

The original amount of sulphate of quinia (364 grs.) employed contains 40 grs. of sulphuric acid, and 324 grs. of quinia:* now, if all the latter were to remain in solution, we should obtain (at the rate of 1 grain in 5 minims) 1620 minims, or 3 oz. 180 minims; but during the evaporation a portion of the quinia has attached itself to the sides of the vessels, and this should not be scraped into the solution, since it will not only fail to redissolve, but will generally produce a further separation of quinia.

It will sometimes occur that, on pouring the ether upon the precipitated quinia in the bottle, the latter absolutely (or nearly so) refuses to dissolve; this is owing to the presence of undecomposed solution of bisulphate of quinia, which seems to prevent the solvent action of ether. By adding a little more ammonia and shaking, the solution will at once take place. But too much ammonia must be avoided, since this gives a tendency to the ethereal solution to deposit the quinia in a short time; at least, such is my experience.

The quinia adhering to the sides of the evaporating vessel may be dissolved off by the aid of a little diluted sulphuric acid, and kept in solution for future use; its amount may be determined by drying and weighing the graduate together with the crust of quinia, and re-weighing it after its removal. Supposing the former weight is 1020 grains, the latter 1000 grains, the difference will be the quinia, 20 grains. Now as

$$324 \text{ (equiv. of quin.)} : 364 \text{ (equiv. of sulph. qu.)} = 20 : x$$
$$x = 22\tfrac{38}{81} \text{ or about } 22\tfrac{1}{2} \text{ grains of sulphate of quinia.}$$

The ethereal solution prepared according to the above directions must be kept in well-stoppered bottles, and should not be long exposed to light. I have kept some samples unaltered for over one year. —*Amer. Journ. Pharm.*

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* The author's calculations are slightly incorrect. Crystallized sulphate of quinia must be heated to between 110° and 120° C. (230° and 248° F.) to lose all its water of crystallization, when it still retains 1 HO of constitution, its formula being $C_{40}H_{24}N_2O_4, HO, SO_3$, and its equivalent weight 373, containing 324 dry quinia and 49 HO,SO_3. (See *Amer. Journ. Pharm.* 1855, p. 243.) 364 grains sulphate of quinia, deprived of all its water of crystallization, contain, therefore, 316 grains dry quinia.—Ed. Amer. Journ. Pharm.

Chapters for Students.

CHEMICAL NOTES TO THE PHARMACOPŒIA.

BY WILLIAM A. TILDEN, D.SC. LOND.

DEMONSTRATOR OF PRACTICAL CHEMISTRY TO THE PHARMACEUTICAL SOCIETY.

LIQUOR PLUMBI SUBACETATIS.

Acetate of lead is boiled with water and oxide of lead, the latter in proportion rather larger than is expressed by the formula

$$Pb\,(C_2H_3O_2)_2\;3\,H_2O + Pb\,O.$$

The solution probably contains more than one compound; but practically it may be looked upon as a solution of oxide of lead. Its strongly alkaline reaction upon test-papers, absorption of carbonic acid from the air to form an insoluble carbonate, precipitation of an insoluble sulphate on addition of sulphuric acid, point to the relationship subsisting between lead oxide and the alkaline earths, baryta, strontia, and lime. Liquor plumbi gives insoluble precipitates with mucilage of gum-arabic, with astringent and colouring matters, and with a large number of organic and other acids. Consequently it can rarely be mixed with a vegetable infusion or tincture without causing turbidity. With tincture or wine of opium, for example, the precipitate which it causes consists partly of meconate of lead, partly of compounds of oxide of lead with the mucilaginous and resinoid matters of the opium. In consequence of this property, a solution of oxide of lead in acetate of lead is frequently employed in the preparation of crystallizable vegetable principles, to remove from their solutions the coloured foreign matters with which they are naturally combined.

In making the liq. plumbi subac. dilutus it is imperative to use distilled water only, and in no case is it proper to clear the solution by the addition of acetic acid.

LIQUOR POTASSÆ.

Four parts of carbonate of potash are dissolved in ten parts of boiling distilled water, and then three parts of slaked lime are gradually stirred in, the ebullition being continued for a few minutes. After standing a short time the clear liquor may be decanted. It should not be filtered.

$$2\,KHO + Ca\,CO_3 = Ca(HO)_2 + K_2\,CO_3.$$

[§ It does not effervesce when added to diluted hydrochloric acid. Mixed with an equal volume of distilled water, it gives no precipitate with solution of lime or oxalate of ammonia.] Good liquor potassæ ought to answer to the first of these tests, but the two latter are unnecessarily severe. [§ When it is treated with an excess of diluted nitric acid, and evaporated to dryness, the residue forms with water a nearly clear solution, which may be slightly precipitated by chloride of barium and nitrate of silver, but is unaffected, or but very slightly affected by ammonia.] These characters show the absence of all but traces of silica, sulphates and chlorides, and alumina.

Liquor potassæ contains 5·84 per cent. of KHO.

LIQUOR SODÆ.—Made in the same manner as liquor potassæ. It contains 4·1 per cent. of NaHO. The chemical equivalent of 5·84 of KHO is 4·16 of NaHO. These quantities will saturate the same amount of an acid.

MILK-ANALYSIS BY THE AMMONIA-PROCESS.

BY J. ALFRED WANKLYN.

The ammonia process, which Chapman, Smith, and myself applied to water-analysis in the year 1867, is available for a great variety of purposes. There is a very simple application to the analysis of milk, which I propose to describe on the present occasion.

In our little book on water-analysis, we gave the proportion of 'albuminoid ammonia' yielded by caseine as 7·6 per cent. As we remarked, we could not guarantee the absolute purity of the caseine employed for that determination. Recent experiments, however, do not greatly modify the result. Apparently, the number was given a little too high, 6·5 being more in accordance with my later experiments. Inasmuch as normal milk contains 4·0 per cent. of caseine, 100 parts of normal milk should give 0·26 part of albuminoid ammonia,' and such is the result of recent determination.

In order to examine milk by the 'ammonia process,' the following method of procedure may be adopted. The milk is first diluted to a convenient degree; 5 cubic centim. (or, preferably, 5 grammes) of milk are placed in a 500 cubic centimetre measure, which is filled up with water to the 500 c.c. mark; the milk and water being then well mixed up together, there results a diluted milk. This diluted milk is of such a strength that 1 cubic centim. contains 10 milligrammes of milk. For the analysis, 50 milligrammes of milk—*i. e.* 5 cubic centim. of the dilute milk—is a convenient quantity.

A tubulated retort, capable of holding about a litre, is charged with 400 cubic centim. of ordinary water of fair quality, such as, for instance, the ordinary river water supplied by the London water companies. Next, then, is poured into the retort 50 cubic centimetres of alkaline solution of permanganate of potash, made by dissolving 200 grammes of solid caustic potash and 8 grammes of crystallized permanganate of potash in one litre of water. The retort is then connected with a Liebig's condenser, by means of a small piece of wide india-rubber tube, and heated by means of a good-sized Bunsen lamp, the naked flame of which may be applied directly to the retort. Distillation then proceeds. The distilled water, as it comes over, should be tested for ammonia by the Nessler-test, in the manner about to be described, and by the time 200 cubic centim. have distilled over, will be found to be quite free from ammonia. This point having been arrived at, the 50 milligrammes of milk (5 cubic centim. of dilute milk) are introduced into the retort, which will then contain 250 cubic centim. of water, 10 grammes of potash, and 0·4 gramme of permanganate of potash. The distillation is then proceeded with as long as ammonia comes over, the ammonia being estimated by the Nessler test.

The measurement of ammonia by the Nessler test is managed as follows:—

A solution of iodide of potassium, saturated with biniodide of mercury, is first prepared thus:—35 grammes of iodide of potassium, 19·1 grammes of bichloride of mercury—are dissolved in less than a litre of water, heat being employed to assist the solution of the salts. It will be found that a slight excess of biniodide of mercury will remain undissolved—filter or decant so as to separate this small quantity of undissolved red iodide of mercury. (Should, through failure to have used the proper proportion of the salts, there be no excess of undissolved iodide of mercury, a little bichloride must be added, until the red precipitate begins to be permanent.) Add, then, either 120 grammes of solid caustic soda, or 160 grammes of solid caustic potash. Dilute the liquid with water to the volume of a litre, and this is the *Nessler reagent*. Before using the *Nessler reagent*, add about 5 cubic centims. of strong aqueous solution of corrosive sublimate, which will occasion a slight precipitate; decant off this precipitate, and the clear liquid is fit for use. This last addition of corrosive sublimate has for its object the rendering of the Nessler reagent sensitive.

Use of the Nessler reagent.—Into a cylinder made of colourless glass, and marked so as to be a 50 cubic centimetre measure, put the distillate which you desire to test for ammonia. Add $1\frac{1}{2}$ cubic centim. of 'Nessler reagent,' which will produce a yellowish-brown coloration. Observe the depth of the colour. On a white piece of paper, side by side with the cylinder containing this coloured liquid just mentioned, place a second 50 cubic centim. cylinder. Into this second cylinder put pure distilled water, and add to the pure distilled water some standard dilute ammonia liquid—as many measures of the standard ammonia as you judge to be requisite. Add $1\frac{1}{2}$ cubic centimetre of Nessler reagent—a coloration will result—compare the colour with the colour of the liquid in the first cylinder. If the colours are equal, write down the quantity of ammonia you have added, and that will be the quantity contained by the 50 cubic centim. of distillate. If the colours are not equal, make another trial with a different quantity of standard ammonia, and so on until you get equal coloration.

The strength of the standard ammonia is such that *one cubic centimetre contains* 1·100th *milligramme* of ammonia. It is made by dissolving 0·315 gramme of chloride of ammonia in one litre of distilled water, and then mixing that solution with nine times its volume of pure distilled water.

The operation of Nesslerizing, as it is called, that is, the operation just described, is not difficult, as the many chemists who are in the habit of practising it have abundantly testified. There are a few little points requiring attention; thus, a few minutes must be allowed to elapse before reading off the colour; the liquid must be cool, the distilled water must be very free from ammonia, etc. The distilled water used for Nesslerizing is best prepared by the operator himself. A fair river water being taken, is set to distil; at first ammoniacal water will distil over, but after a time water free from ammonia will distil, and this must be tested, and then carefully preserved for use.*

The following are some examples of milk-analyses by the ammonia process :—

Milk yielding 12·92 per cent. of solids, and 8 per cent. of cream.

	Quantity of Milk taken.	Quantity of NH_3 obtained.
Exp. I.	100 milligr.	0·27 milligr.
Exp. II.	50 "	0·13 "
Exp. III.	50 "	0·13 "

Milk which appeared to have been somewhat skimmed, but not watered. Solids, 11·42 per cent.

	Quantity of Milk taken.	Quantity of NH_3 obtained.
Exp. I.	50 milligr.	0·135 milligr.
Exp. II.	100 "	0·255 "

Slightly-watered Milk. Solids 10·20 per cent.

	Quantity taken.	Quantity of NH_3 obtained.
Exp. I.	50 milligr.	0·095 milligr.
Exp. II.	50 "	0·095 "
Exp. III.	100 "	0·022 "

Highly-watered milk. Solids, 6·18 per cent.

	Quantity taken.	Quantity of NH_3 obtained.
Exp. I.	50 milligr.	0·075 milligr.

Highly-watered milk. Solids, 8·10 per cent.

	Quantity taken.	Quantity of NH_3 obtained.
Exp. I.	50 milligr.	0·070 milligr.

Expressed in a tabular form :—

	Percentage Solids in Milk.	Percentage of Ammonia.
I.	12·92	0·27
II.	12·92	0·26
III.	12·92	0·26
I.	11·42	0·27
II.	11·42	0·255
I.	10·20	0·19
II.	10·20	0·19
III.	10·20	0·22
I.	6·18	0·15
II.	8·10	0·14

In order to translate these results into percentages of caseine contained by the different samples of milk, it has to be borne in mind that 6·5 parts of ammonia correspond to 100 parts of caseine. The ammonia, therefore, when multiplied by 100 and divided by 6·5, indicates the caseine. In conclusion, the ease and rapidity of these determinations may be referred to. In half an hour an analysis of milk by the ammonia process may be easily made.—*The Milk Journal.*

* For further details I would refer to the book on Water-analysis, by Chapman and myself.

THE MODERN ASPECTS OF THERAPEUTICS.

BY WALTER G. SMITH, M.D.

(*Concluded from page 106.*)

But the most decided step in this direction has been made by Drs. Crum Brown and Fraser, in their important papers "On the Connection between Chemical Constitution and Physiological Action" (1868-69). By introducing a known chemical change into the constitution of a physiologically active substance, without breaking up its molecule, they have shown that the physiological action of the substance may be completely altered, and, in fact, inverted in kind.

They have examined with great care the physiological action of the salts of the ammonium-bases derived from eight of the better known alkaloids, and their results lead to the suspicion that chemical *condensation* (*i.e.* susceptibility of addition) is in some way connected with physiological activity, and that saturated bodies (*i.e.*, whose condensation = °) are inert, or nearly so. Thus by the addition of iodide of methyl to the non-saturated base strychnia, the poisonous activity of that alkaloid is diminished at least 210 times, and a quantity of iodide of methyl-strychnium, containing 21 grs. of strychnia, can be given to a rabbit with impunity. These observations are of the highest value, though at present they must be considered as but foretastes of what is to come, and it is remarkable that almost immediately after, two French physiologists, MM. Jolyet and Cahours published results corresponding in almost every respect with those of Brown and Fraser.

Dr. Richardson has done good work in the field of anæsthetics in their chemico-physical relations, and he has brought out the curious and interesting fact that, in the alcohol group, the anæsthetic effect has a definite connection with the chemical composition of the alcohol, the anæsthesia rising in proportion to the number of atoms of carbon; for example, contrast the action of ethylic alcohol, containing C_2, with amylic alcohol, containing C_5. It is observed also that definite changes are produced by the addition or substitution of new elements or radicals, such as H, Cl, I, C_2H_5, etc., and when the chemical relationships between different bodies are more thoroughly understood, we may eventually be able to deduce *à priori* the physiological action of a body from its known chemical history.

Dr. Rabuteau, who has made many contributions to physiological chemistry, believes that he is justified by his investigations in propounding, as a general law, that "the metals are more active physiologically, according as their atomic weights are more elevated, or, what is the same thing, as their specific heats are lower," *e.g.* Na, K, and Tl. The diatomic metalloids conform also to this atomic law, but the monads, curiously, are governed by a law which is the reverse of this. Thus F, Cl, Br, and I, is the order of physiological activity of the halogens, and this is precisely the inverse order of their affinity for O.

These illustrations are, at least, sufficient to shadow forth the assistance, qualitative and quantitative, which we may expect from physical and chemical science, and warrant us in believing in a sure foundation for future therapeutics. It is true that the facts, as yet known, are mostly isolated and disconnected, but we may compare them to separate bricks which, though singly of little value and without cohesion, yet when cemented and fitted together, will form a firm and durable superstructure. The physiological school, headed by C. Bernard and Brown-Séquard, has done much to elucidate the action of some most important drugs, and it is likely that the doctrine of physiological antagonists will lead to practical results.

The different effects of remedies when introduced by different channels, the principle of the administration of smaller doses frequently repeated, and the potency of drugs over the vaso-motor nerves are all receiving a greater or less share of attention, and are exerting a wholesome influence on our habits and methods of prescribing.

Yet even with the most perfect knowledge of the chemical and other properties of drugs, we cannot satisfactorily judge of the influence which they exert on disease, unless we know, in any case of recovery in which medicine has been used, what share is to be assigned to the curative power of the organism itself. The evident importance of this inquiry was recognized by the Austrian School of Medicine for years before it attracted much attention in these countries, and we have now, at all events, learned that a large proportion of diseases, numbering some of the most formidable character, may get well without the use of any drugs whatsoever, or, in other words, they have a natural tendency to terminate in the restoration of health. This salutary change of doctrine is due in part to an examination of the undeniable results afforded by homœopathic practice, but largely owes its impetus to the improved state of physiological and pathological science. There is, however, some danger of being over-zealous in our respect for nature's operations, for the efforts of nature are not always of a benignant tendency, and what is called "expectant medicine" may sometimes prove but "a meditation upon death."

A more accurate knowledge of the real properties of drugs than we have hitherto possessed, lies at the root of all future progress, and the mode of its accomplishment claims attention at the outset. This will be best carried out by carefully conducted trials on *healthy* individuals, checked by collateral experiments on the lower animals, and on patients suffering from diseases whose diagnosis, general course, and variations, are tolerably well known. Hitherto it has been almost exclusively the custom to endeavour to acquire a knowledge of medicines by instituting trials with them in disease, a method which has borne little fruit in return for the labour bestowed upon it. To Hahnemann, in particular, before he was carried away by the delusion of infinitesimal doses, belongs the credit of actively pushing forward the proving of medicines on healthy individuals, recommended by Störck, Alexander and Haller, and it is strange that, with very few exceptions, no provings of worth have been made by other practitioners until very lately.

Within the last two years Dr. J. Harley has shown the value of this line of inquiry in his elaborate and searching work on the action of opium, belladonna, conium and hyoscyamus, in which he has done much towards defining our knowledge of the effects and uses of these ancient neurotic remedies.

One most important issue of the careful testing of drugs would be the better determination of the "sphere of action" of each medicine, for it is already well known that certain drugs affect particular organs and tissues, and I believe, with Dr. Rogers, that this significant fact of drugs possessing elective affinities for certain textures will occupy a prominent place in our future therapeutics. We have reason to believe that the physiological and therapeutical actions of medicines are very closely related, and it is probable that the modifications impressed by various diseased conditions will not so materially alter their sphere of action, as is sometimes supposed.

Another real gain from this probation of drugs would be the expulsion from the materia medica of a crowd of articles which only serve to keep alive the embers of polypharmacy, and to obstruct our advance towards a more rational system of therapeutics. If we accept, as we may safely do, the axiom that a drug, which produces no perceptible effects when properly tested on healthy individuals, will prove equally inert in disease, what a host of reputed medicines would be cast into deserved oblivion!

Before concluding, I wish to point out most emphatically that we should not allow ourselves to overlook the continued necessity for bedside observation in our admiration of the progress and prospects of the scientific departments of medicine. Though our theoretical knowledge were ever so perfect, yet clinical experience must always hold an important position to every true physician, and "it is to the experience of the mass of the profession that we look for the final establishment of doctrine and rules of practice." The most rapid and complete advances in science can never do away with the necessity for watchful observation, and "the nice adaptation of means to end can only be gained by experience." The past history of medicine should teach us not to be too hasty in condemning or ridiculing a line of practice which united and prolonged experience has approved, even if it be contrary to the received dogmas of the day, or be incapable of immediate explanation. Rational experience must and will keep its place. Let it by all means be reinforced and directed aright, but not trammelled, and clinical researches and empirical decisions must eventually prove the touchstone of therapeutical theory.

Keeping in view, then, that the three chief aims and objects of medicine, especially so far as concerns the non-professional public, ought to be the cure of disease, the prolongation of life, and the alleviation of physical suffering, we can sum up, in Sir W. Jenner's words, our gains in practical medicine, as resulting in "advances in knowledge, in the addition to the science of medicine of new facts, the elimination of supposed facts, the more correct appreciation of the bearing of old facts, and the application of this new knowledge to the advancement of the practical objects of the science."

And, though the discoveries of our own time naturally appear to us of greater importance than those of preceding ages, even the most incredulous will admit that we have reached a stage when ignorance is giving way to knowledge, hypothesis to facts, and that the time is approaching when we shall be able to free ourselves from the quicksands of uncertainty, and rest on the firm basis of knowledge and truth.

THE PHARMACY BILL.

MEDICAL SOCIETY OF LEEDS.

At the Meeting of the Medical Society of Leeds, held at the School of Medicine, on Wednesday, July 12th, 1871, Dr. Clifford Allbutt in the chair, it was resolved unanimously:—

"That the manner in which the Pharmacy Bill proposes to regulate by law the minute circumstances of the storing of powerful drugs, has been laid before this meeting, and this meeting considers that ample time should be given by Parliament to estimate to what extent it will infringe upon the privileges of the medical profession. Since the Bill would enforce in the dispensaries of many medical men certain danger-signals, as applied to powerful drugs, which would not exist in closed surgeries, increased danger to the public might result, and this meeting trusts that Parliament will refuse its sanction to the Bill as it now stands."

MEETING OF CHEMISTS AT LEEDS.

A Meeting of subscribers to the fund for opposing the late Pharmacy Bill was held in the Library of the Leeds Chemists' Association on Monday, August 7, 1871; Mr. W. Smeeton, President of the Chemists' Association, in the chair; it was unanimously resolved,—

"That the hearty thanks of this meeting are due and are hereby tendered to W. M'Cullagh Torrens, Esq., M.P., for his opposition to the late Pharmacy Bill."

"That the best thanks of this meeting are due and are hereby tendered to Edward Baines, Esq., M.P., Mr. Alderman Carter, M.P., W. St.-J. Wheelhouse, M.P., C. B. Denison, Esq., M.P., and J. Feilden, Esq., M.P., for the courtesy and attention with which they received the representations made to them of the objectionable character of the late Pharmacy Bill, and for the grounds which most of these gentlemen have given their constituents for believing that they would have opposed its second reading."

"That this meeting approves of the decision of the Chemists' Defence Association, and of the Metropolitan Chemists' Defence Association, to maintain their organization, and recognizes their past valuable services in protecting the best interests of the trade as giving them additional claims for continued support."

"That the best thanks of the meeting be given to Mr. Smeeton for presiding."

UNIVERSITY OF EDINBURGH.

The ceremony of "capping" graduates in the University of Edinburgh took place in the Music Hall, on Tuesday, August 1st.

Professor Macpherson, Dean of the Faculty of Law, presented the following gentlemen for the honorary degree of LL.D., and made a short statement of the principal claims of each to the honour.

Thomas Andrews, F.R.S., H.F.R.S.E., Vice-President of Queen's College, Belfast, and Professor of Chemistry in the Queen's University, for his investigation into the laws of the development of heat in chemical combination, researches on ozone and demonstration of the continuity of the liquid and gaseous states of matter.

Pierre Joseph Van Beneden, Professor of Comparative Anatomy in the University of Louvain, author of memoirs of great value in various departments of comparative anatomy.

W. B. Carpenter, F.R.S., M.D. Edin., Registrar of the University of London, for his various writings on physiology, investigation into the condition of the deep sea and services in the promotion of education.

Professor Challis, for a quarter of a century Director of the Cambridge Observatory and Plumian Professor of Astronomy and Experimental Physics.

Auguste Colding and James Prescott Joule, for their services to science in connection with the subject of the conservation of energy.

James Joseph Sylvester, late Professor of Mathematics at Woolwich, for his contributions to mathematical science.

George Gabriel Stocks, Secretary of the Royal Society, Lucasian Professor of Mathematics in Cambridge University, for his contributions to mathematics and physiology.

Allen Thomson, M.D., Professor of Anatomy in the University of Glasgow, for his writings on embryology.

W. Spottiswoode, F.R.S., Treasurer of the Royal Society and of the British Association, for his distinguished services in the cause of science.

G. E. Paget, M.D. Cantab., D.C.L. Oxon., President of the General Medical Council.

William Huggins, F.R.S., D.C.L. Oxon., eminent among those who have brought into prominence the application of spectroscopy to the stars, developing, with the aid of modern researches, the modes of observation initiated by Fraunhofer.

Jules Janssen, another eminent spectroscopist, who has devoted himself specially to solar spectroscopy.

John Peter Gassiot, F.R.S., distinguished for his researches in electricity, and for the interest he has manifested in the Observatory at Kew by his recent munificent endowment of its magnetic observatory.

Various other degrees were conferred upon gentlemen entitled to receive them.

Professor Bennett then delivered the concluding address. After alluding to various changes that had occurred since he last addressed the graduates in 1849, he described the education which the University provided for the medical student, and adverted to the important position to be held by him in the future, and the valuable service he might render to the State by assisting to diffuse sound knowledge on vital points concerning the health. Reference was made to the ignorance still displayed in these matters, in spite of the lessons taught by the scurvy and smallpox; and the speaker attributed the immunity from smallpox enjoyed in Scotland during the last few months to the vast advantage resulting from Government interference, and compelling the people against their will to take the necessary precautions. These and other examples show the utter uselessness of supposing that sanitary laws will ever be followed by the public as long as they remain ignorant of the rudiments of the knowledge necessary for the preservation of their own lives. Under the present system of education classical and literary studies, and the reading of imaginative works—including poetry and most histories and biographies,—may foster taste and lead to the cultivation of art and of all that supports the elegancies of life, but it keeps up a metaphorical mode of speech and inexactitude of language, which has descended to us from the earliest times. The ancients believed that life was an immaterial principle that might be added to or taken away from the body, as exemplified in the fable of Prometheus, who animated the marble statue with fire stolen from heaven. They thought that the mental faculties and feelings were seated in the internal organs of the body. Hence the terms, "vital spirit," "spark of life," and so on, while the heart, the liver, the spleen, the reins, and other viscera, are referred to literally or metaphorically, as so many seats of mental faculties or moral feelings. We talk of the emotions of the heart as representing a state of mind distinguished from the reasoning powers. This loose and vague kind of language renders those that use it upholders of all kinds of error. Indeed these are the class of persons everywhere most intolerant, because they are least capable of comprehending scientific laws and scientific evidence. Clergymen and most religious teachers are totally insensible to the errors and discrepancies of language they use in the pulpit, so that, when the scientific man takes his place in church, he is surprised at the ignorance of established truths constantly shown. While acknowledging the great services rendered by the clergy, he thought what incalculably greater good would they effect if, in addition to their actual knowledge, they were acquainted with what is known as to the laws of life, the causes of death, the proper means for averting disease, and the influence which the body and the mind exert upon each other. It were easy to point out how all professions and all ranks of the community might in like manner be benefited by a similar acquaintance with physiological truth. Women in all ranks of society should have physiology taught to them. It should be an essential subject in their primary, secondary, and higher schools. So strong were his convictions on this subject, that he esteemed it a special duty to lecture on physiology to women, and he found them most attentive and interested in the subject, possessing indeed a peculiar aptitude for the study, and an instinctive feeling, whether as servants or mistresses, wives or mothers, that *that* science contained for them, more than any other, the elements of real and useful knowledge.

The Pharmaceutical Journal.

SATURDAY, AUGUST 12, 1871.

Communications for this Journal, and books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

CHEMISTS AND THE USE OF STILLS.

OUR correspondent "*Aqua Destillata*" has drawn attention to the "Act to Prevent the Use of Stills by Unlicensed Persons," but the conclusions at which he has arrived can scarcely be borne out by facts, or by the simple meaning of the words of the Act in question.

He states that the Commissioners of Inland Revenue are in this case acting in direct opposition to the Legislature, but he should bear in mind that in the framing of revenue laws the Commissioners and the Legislature are practically identical.

In the case of old duties a Bill is not prepared for their protection, unless the Commissioners have had instances brought under their notice sufficiently numerous to convince them that the revenue is in danger, and then they prepare a Bill based on this experience which will, as they believe, remedy the defects in the law. These Bills are generally passed without opposition, because they are known to have originated with those responsible to the country for the equitable collection of the duties imposed by the Legislature.

In the case of new duties, the Government is certainly responsible for their imposition, but the Commissioners prepare the requisite machinery for their equitable assessment.

Now in the case under notice, the facts are simply these. The Act 6 GEORGE IV. cap. 81 expressly states that "*every* person in Scotland or Ireland not being a distiller, rectifier or compounder of spirits, who shall keep or use any still for the carrying on the trade of a chemist, or any other trade or business requiring the use of any still or stills, shall pay a licence of ten shillings per annum." The Act 9 & 10 VICT. cap. 90, extends the provisions of this Act to England, and in the first section the words used are; "For every excise licence to be taken out by every person, not being a licensed distiller, rectifier or compounder of spirits, or vinegar-maker who keeps or uses any still or retort, the sum of ten shillings."

It will be seen that in the latter Act the word *chemist* is omitted, but in the second section of this Act it is distinctly stated that all "previous clauses, matters and things contained in the said recited Act of the 6 GEO. IV. cap. 81, shall be applicable to this Act, and to the several provisions, clauses, matters and things in this Act contained, as fully and effectually as if the same had been repeated and reenacted in the body of this Act."

As stated by our correspondent, the Act 9 & 10 VICT. cap. 90, contains the following exemptions:—"1st. Stills may be kept and used for experiments in chemistry; 2nd. Stills may be kept and used by persons carrying on trade or otherwise for the manufacture of any articles other than spirits or spirit mixtures." It must not, however, be overlooked that although there are these exemptions, the Commissioners, in framing this Act, have been careful to strictly reserve to themselves full power of granting or withholding these indulgences; and if the two Acts are carefully read together, it will be seen that the words "may permit" really mean that the Commissioners, having full power to compel all persons keeping or using stills to pay the licence duty, they in their discretion may (as a privilege, but not as a right) permit stills to be used without licence in cases of purely chemical research, and in those trades in which articles other than spirits or spirit mixtures are manufactured; provided always that they can impose such restrictions for the protection of the revenue, as they may think proper for its security.

The last clause of the Act seems to imply that the Commissioners have not the power to grant such indulgences to persons manufacturing spirits or spirit mixtures. Spirit mixtures would certainly include tinctures and all other preparations of which alcohol is an ingredient, and consequently the indulgence could not be extended to pharmacists.

As a general principle it must be borne in mind that the Commissioners of Inland Revenue being solely responsible for the spirit duties, which now amount to upwards of ten millions per annum, are compelled to make all their regulations tend to this one object; and, as a governing body, they could not grant an indulgence to keep a still to a single pharmaceutical chemist—who in good faith would use it simply for preparing distilled water—unless they were prepared to grant a similar indulgence to every chemist in the United Kingdom, and at the same time were ready to undertake the responsibility of providing such a system of supervision that the stills should be used only for legitimate purposes.

WE have been favoured by several correspondents with copies of a paragraph taken from the *Pall Mall Gazette*, founded upon the sad occurrence reported at p. 138 of this Journal, and bearing the sensational heading of "The Necessity for Hanging a Chemist." We do not see that any benefit can accrue from the reproduction of such an article; but as a sample of the whole we cull the one statement that "scarcely "a week passes without a coroner's jury returning a "verdict of 'death by misadventure,' the 'misad-"venture' being that some blundering chemist has "poisoned a customer." Lamentable as such an accident may be, when it does occur, and desirous as every one must be to devise means for preventing its repetition, we do not think the attainment of such an object will be much assisted by the pen of a writer who is evidently either quite ignorant concerning the subject on which he writes, or else willing, for the sake of spicing an article, to make statements which are so grossly exaggerated. Neither should we have thought that in a journal which claims to be written by gentlemen for gentlemen so much would have been sacrificed to the necessities of smart writing.

In a Report of Mr. W. G. M'Ivor, the Superintendent of the Government Cinchona Plantations in British Sikkim, he says that the state of the plantations near Darjeeling is very unsatisfactory. The plants have not the luxuriant foliage of those grown in the south of India, and trees of equal height do not produce an equal amount of bark, the trees being of more slender growth and the bark thinner. The climate is very moist, being rarely free from rain, and seems admirably adapted for the growth of cinchona; but the trees appear to thrive for three years at most, and then to become diseased.

A prospectus has been issued of a "Beetroot-Sugar Company," which it is proposed to form for the purpose of developing the products of sugar beet grown in the United Kingdom in a similar manner to the industries which have been successfully carried on for many years past in different Continental countries. The capital proposed is £200,000 in 20,000 shares of £10 each, half of which shares are to be issued directly.

We learn from the *American Journal of Pharmacy* that the sale of spurious quinine, which is a counterfeit of that of Messrs. Pelletier, Delondre and Levaillant,* is still carried on extensively in New York. It is now supplemented by another fraud, in which sulphate of quinine is sold for sulphate of morphia. This is offered in original 1-ounce bottles, put up by a London house, the quinine label being removed by the impostor, and a sulphate of morphia label substituted.

The Committee of the London School Board appointed to draw up a scheme of education have sent in a report, recommending the teaching of science in primary schools.

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* See Vol. I. p. 707.

Provincial Transactions.

NORWICH CHEMISTS' ASSISTANTS' ASSOCIATION.

On Monday, the 24th ult., a lecture was given at the rooms of the above Society, by Mr. E. Nuthall, the subject being "Sulphur." The lecturer began by treating of the natural history of sulphur, and the various methods of preparing and purifying the same; and, after noticing its leading chemical characteristics, passed on to the consideration of its more important compounds.

The lecture was fully illustrated by very striking experiments.

Proceedings of Scientific Societies.

BRITISH PHARMACEUTICAL CONFERENCE.

On Tuesday, the meetings of the British Pharmaceutical Conference commenced in the Craigie Hall, No. 5, St. Andrew Square, Edinburgh. Mr. W. W. Stoddart, F.C.S., F.G.S., Bristol, President of the Conference, occupied the chair. About 100 members were present.

The President, in opening the proceedings, said,—Gentlemen, we will now commence the business we have before us; and in doing so I would just ask those who are present, who may be delegates from other Associations, to give in their names. The Associations in other parts of the country are working wonders, and we desire, in our own as well as their interests, to notice them as much as possible.

Delegates.

The following gentlemen, who attended as delegates from various societies, gave in their names as follows:—Brighton—Mr. Savage and Mr. Schweitzer; Bristol—Mr. Schacht and Mr. Stoddart; Liverpool—Dr. Edwards (also delegate from the Pharmaceutical Association of the Province of Quebec), Mr. Shaw and Mr. Mason; Hull—Mr. Bell and Mr. Myers; Manchester—Mr. B. Benger; Glasgow—Mr. Fraser, Mr. Davidson, Mr. Kinnimont and Mr. Fairlie.

The Meeting in 1872.

Mr. Schweitzer said: Mr. Savage and I have been deputed by the Brighton chemists to offer the Conference a hearty invitation to that town as its next place of meeting, and to state on behalf of the chemists there that they will do their very best to make you spend a happy time.

The President: It is only necessary for me to say, after the kind invitation which Mr. Schweitzer has brought us, and knowing that the British Association will meet at Brighton next year, that we shall be happy to hold our Conference in that town. Is it your pleasure that we accept the kind invitation?

It was unanimously agreed to accept the invitation.

New Members.

The President: You will see that the next business before us is the election of members. I have to state that in order to save time the Committee at a meeting last night elected sixty-four new members. It will be for the Conference to approve of what the Committee has done.

Honorary Members.

The President said: I think that now is the proper time to elect the honorary members. There are two gentlemen whose names we wish to add, and who are very well known. I mean, Prof. Maisch, America, and Dr. De Vrij, the Hague. We shall be highly honoured to have their names on the list. I therefore propose that they be added.

The motion was agreed to.

Annual Report.

Professor Attfield (one of the general Secretaries) read the annual report of the Committee as follows:—

The President and Executive Committee once more have to report to the members of the British Pharmaceutical Conference that during the past year the Association has largely increased in numbers, usefulness and general prosperity. Nearly two thousand names are on our books, each member has been presented with a copy of the Year-Book, and the Treasurer's statement shows a balance in hand of fifty pounds.

Meetings of the Executive Committee.—During the past year your Committee has held six meetings.

On October 5th, 1870, after some matters of detail relating to the Liverpool meeting had been disposed of, a formal vote of thanks was conveyed to the Chairman, Secretary and other members of the Liverpool Local Committee, for the judicious, liberal and successful manner in which they had advanced the objects of the Conference. Mr. James Collins was then appointed to give evening assistance to the Metropolitan Secretary, in keeping the books of the conference, issuing circulars and acknowledging subscriptions; the post being made tenable for one year at a salary of twenty-five pounds. Messrs. Carteighe, Groves, Hanbury, Ince and Stoddart, with Professor Attfield as Secretary, were reappointed a Committee to superintend the publication of the Year-Book of Pharmacy. At this meeting eleven candidates were elected to membership.

On December 7th, 1870, two long reports of business transacted by the Year-Book Committee, on October 19th and 20th, were read, discussed and adopted. The continued illness of Mr. Brough had rendered imperative the appointment, by this Sub-committee, of a joint editor, an office which Mr. Joseph Ince had, after some persuasion, consented to accept. The Executive confirmed the action of the Sub-committee. Arrangements were then made for the distribution of the Year-Book to members. Ten gentlemen were elected to membership.

On February 1st, 1871, the labours of Local Treasurers and the courtesy of London merchants, in conveying parcels of the Year-Book gratuitously, were duly recognized and recorded. Plans for obtaining an increased number of members with the view of securing sufficient funds to continue the publication of a Year-Book were introduced by the Secretary, and fully discussed. At a previous meeting the Executive Committee had accepted, with much regret, the resignation of Mr. John Cargill Brough, as editor of the Year-Book. The sad state of Mr. Brough's health rendering any resumption of editorial work impossible, invitations to apply for the appointment had been issued, and responded to by three gentlemen. After due deliberation, the Committee elected Mr. Charles H. Wood, F.C.S., to the vacant post. Mr. Daniel Hanbury, F.R.S., and Professor Attfield were requested to revise the list of gentlemen, societies, and journals, receiving presentation copies of the publications of the Conference. The financial position of the Conference was considered at this meeting. The following proposition was carried unanimously:—"That the cordial thanks of the Executive Committee be conveyed to Mr. Joseph Ince for his valuable services in editing, at a very brief notice and at much personal inconvenience, the 'Year-Book of Pharmacy for 1870." Fifty-three candidates were elected to membership.

On May 16th, 1871, the London Secretary reported on the distribution of the Year-Book, described the difficulty, labour and expense connected therewith, and proposed that in future the volume should be sent by post direct from the printers to each member who had paid the annual subscription (5*s.*) and sixpence in addition for postage (total 5*s.* 6*d.*). The Committee instructed the secretaries to carry out this plan during the succeeding year. The secretaries were empowered to issue a new form of nomination and a new specimen page of the Year-Book. The estimates of Messrs. Butler and Tanner for printing, and Messrs. J. and A. Churchill for publishing a second Year-Book, on terms similar to those under which that for 1870 was produced, were accepted. The report of the Sub-committee on presentation copies of the Year-Book having been read and adopted, a resolution was passed, "That a copy of the Year-Book shall be offered to each provincial pharmaceutical association having a library." A list of subjects suggested for research was laid before the Committee, and Messrs. Williams, Groves and Attfield appointed to revise the same before its distribution to members. Eighty-one gentlemen were elected to membership.

On July 5th, 1871, the secretaries reported that since the previous meeting of Committee the following documents had been posted to each of the one thousand eight hundred members:—(*a*) the list of subjects suggested for research, together with (*b*) two nomination papers, (*c*) a specimen page of the Year-Book, and (*d*) a letter requesting members to obtain candidates for election; another letter (*e*) and other invitation papers had been sent to four or five hundred gentlemen likely to join the Conference. The Annual Circular (*f*) relating to the General Meeting for 1871, and, an enclosure (on behalf of the Edinburgh Local Committee) of (*g*), a card of invitation to a Conversazione have also recently been forwarded. The Report of the Year-Book Committee relating more especially to the arrangement of matter in the Year-Book was received and adopted. At this meeting of the Committee one hundred and forty-eight gentlemen were elected members.

Finally, on July 31st, your Committee met in Edinburgh to arrange business for the present meeting, and to elect sixty-four members.

Number of Members.—It will thus be seen that as a result of the labours of your Committee, the efforts of local secretaries and the kindness of individual members, about three hundred new names have been added to our roll since we assembled last autumn. The total number of members is now 1917. From these figures, however, there must be deducted, losses by death, 8, resignations, 14, untraced removals, 6, and members whose subscriptions are more than two years in arrear, 11, —total 39. This gives an effective strength of 1878. The Executive Committee congratulates the Conference on this high number, but would urge on every member the importance of using his utmost efforts in obtaining recruits. The production of Year-Books, without intermission, can only be secured by the united contributions of at least two thousand members. A much larger number than this may fairly be anticipated as the objects of the Conference become more widely known and more fully appreciated.

Amongst those whom death has taken from us there occur the following:—Mr. Gissing, of Wakefield, whose name is appended to the original circular inviting gentlemen to join the Conference then about to be inaugurated at Newcastle-on-Tyne in 1863; Mr. Tuck, of Oxford, five of whose papers appear in our Transactions: —1, "Mistura Creosoti;" 2, "Iodo-hydrargyride of Potassium, and the Oxidation Tests for Methylic Alcohol;" 3, "Test for Methylic Alcohol when mixed with Ethylic Alcohol; 4, Detection of Methylic Alcohol in Chloroform, Ether, Sweet Spirit of Nitre and Sal Volatile;" and 5, "On Eschwege's Patent Wood Spirit;"—and Mr. Quiller, of London, a name well known in pharmacy.

The Bell and Hills Fund.—A second grant of ten guineas' worth of books has been made by your Committee in accordance with the intentions of the benevolent founder Mr. Thomas Hyde Hills. Fourteen appropriately-bound volumes of recent works, not already in their library, were presented to the Liverpool Chemists'

Association and duly acknowledged. A similar present will be offered to the library of the North British Branch of the Pharmaceutical Society.

The Year-Book of Pharmacy for 1871, the second issued, is in a forward state, indeed the editor has laid on the table the manuscript of the work. As soon as the proceedings of the present meeting can be reported, the whole of the volume will be placed in the hands of the printers and, when published, a copy forwarded by post to members.

The Financial Position of the Conference.—Lastly, your Committee would draw attention to the Treasurer's statement of accounts. Every liability for the eighth Conference year—July 1st, 1870, to July 1st, 1871—has been discharged, and there is a balance in hand of £50. This sum is less by £40 than that remaining at the end of last year, but several exceptional expenses have been incurred, hence your Committee hopes that the income of the present year will meet the expenditure; a result that will certainly ensue if members will kindly obtain additional subscribers.

The Treasurer in Account with the British Pharmaceutical Conference, 1870–1871.

Dr.	£ s. d.
To Cash in hand, July 1st, 1871	96 10 9
,, Sale of Year-Books	11 10 0
,, Advertisements in Year-Book	58 1 0
,, Members' Subscriptions	401 11 11
	£567 13 8

Cr.	£. s. d.	£. s. d.	£. s. d.
By cost of 2000 Year-Books :—			
Editing, Mr. Brough (balance of £50)	15 0 0		
,, Mr. Ince	50 0 0		
		65 0 0	
Printing, Butler and Tanner		221 0 0	
Binding, ,, ,,		75 0 0	
Woodcuts		1 10 0	
Publishing, J. and A. Churchill :—			
25 per cent. Commission on Advertisements		14 10 3	
Advertising		2 2 0	
Addressing and Wrapping		6 18 6	
Delivering 1100 Year-Books for enclosure		9 3 4	
Postage and Booking		2 1 6	
Postage and Booking by Secretary		10 0 0	
			407 5 7
,, General Printing :—			
Taylor and Co.		18 13 0	
Butler and Tanner		12 8 6	
Marples		5 7 0	
Sheldon		1 10 0	
			37 18 6
,, Advertising			0 10 0
,, Stationery			2 2 11
,, Addressing Circulars			10 4 0
,, Salary to Assistant-Secretary (3 quarters)			18 15 0
,, Postages and Telegrams			33 7 5
,, Post-Office Charge for Cashing Stamps			3 4 3
,, Various Petty Expenses			4 6 0
,, Balance in hand			50 0 0
			£567 13 8

1871.	£. s. d.
July 1st, Balance in hand	50 0 0
Estimated Arrears of Subscriptions up to June 30th, 1871	20 0 0
	£70 0 0

Copies of Year-Book of 1870 in Stock, 200.

Bell and Hills Library Fund, 1870–1871.

	£. s. d.
To Cash in hand	42 0 0
By Books forwarded to Liverpool	10 10 0
Balance in hand	£31 10 0

Examined and found correct,
H. S. Evans, *London.*
J. F. Robinson, *Liverpool.*

Mr. Ainslie (Edinburgh) said: I have much pleasure in moving that the report be adopted. It must be very satisfactory to those gentlemen who have originated this Conference to find that its affairs are in such a flourishing condition. There have been a great many additional new members this year, and I trust that in the year that is coming we shall have a much larger number, so that they will be able to give the Year-Book of Pharmacy without loss. I think that the number which Dr. Attfield has intimated—2000—will be made up before the next Conference. I think it is a very great advantage to us to have that book on our library tables.

Mr. Fraser (Glasgow) said: I have much pleasure in seconding the adoption of the report. The sum of 5*s.* paid by each member seems to be a very small sum. I think it might be raised to 7*s.* 6*d.* Five shillings is a very small sum to get the advantages of the Society.

Dr. Attfield: There will be no difficulty in raising enough money if we get more members. It only requires an effort. I have never asked a gentleman to become a member who has ever refused to do so; on the contrary, I have been thanked by gentlemen whom I have informed that they would get a book so full of matter, specially interesting to them, for so low a sum. In my opinion, the question of raising the subscription need not be entertained for one moment.

The report was unanimously agreed to.

The President then read his introductory address, which will be found at p. 112.

Mr. Kemp (Portobello) said: When I say that I have listened to the address of our President with very great pleasure, I am sure I am only expressing the feeling entertained by every one present. I think we are under very great obligation to the President for the very able, clear and succinct manner in which he has noticed the many new and important advances in pharmacy, and sketched out for us important and interesting studies on these subjects. He has noticed in the course of his address the importance of practical pharmacy. The time was when pharmacists were content with mere practice—with mere routine. I think that has greatly given way, and that it is now admitted that if practical pharmacy is to arrive at anything like perfection it must have a scientific basis. The very fact of the existence of the Pharmaceutical Conference is an evidence that scientific pharmacy is now carefully studied; and I have only to point to the very large meetings we now have as a further proof of that. I cannot enlarge on the address; but I desire on the part of the meeting to express our very hearty thanks to the President for his most excellent address. I beg to move to that effect.

Mr. Young: I beg to second the motion which has been proposed by my friend Mr. Kemp. Mr. Stoddart has given us an admirable view of what has been done during the past year; and I am sure we are all very grateful to him for the excellent reflections contained in the concluding portion of his address. There is very much in what he said that in addition to the masters being fit to instruct their pupils, the pupils should be in a condition to be instructed by them. I will say no more, but simply express my great satisfaction at listening to the able address which has just been delivered.

Mr. Deane: It has been moved that a cordial vote of thanks should be given to our President for his very admirable address. It would be quite superfluous in me to add anything, and therefore I will not take up your time. I very cordially concur in the motion. It is a rare thing for us to have such an address given to us. I therefore put it to you, as a mere matter of form, to say if the motion is carried.

The motion was carried amid loud applause.

The President: I thank you all for the very cordial expression of your approval of the address. I can only say it is no work; it is a real pleasure to do anything for this Conference. It is really a work of love.

Professor WRIGHT, D.Sc., read the following paper on

THE OXIDATION PRODUCTS OF ESSENTIAL OIL OF ORANGE-PEEL (KNOWN AS "PORTUGAL").

BY C. R. A. WRIGHT, D.SC.,
Lecturer on Chemistry in St. Mary's Hospital Medical School,

AND CHARLES H. PIESSE,
Assistant Analyst in St. Thomas's Hospital.

PRELIMINARY NOTICE.

Through the kindness of Messrs. Piesse and Lubin, we have been enabled to examine a specimen of *pure* oil of orange-peel. As stated by Soubeiran and Capitaine, and by Dr. Gladstone, this oil consists principally of a hydrocarbon, hesperidine, boiling at 174°, and of formula $C_{10}H_{16}$. We found that the crude oil commenced to boil at 175°, and that 97·2 per cent. by weight came over below 179°; the remaining 2·8 per cent. was a yellow, resinous substance, not volatile without decomposition, sparingly soluble in alcohol even when boiling, but very soluble in ether. In water it was almost insoluble, but it communicated to it the bitter taste of fresh orange-peel. At 100° it was perfectly fluid, but did not entirely solidify even after standing some days at the ordinary temperature. After complete expulsion of hesperidine by long-continued heating to 100°, it was perfectly inodorous; it contained no nitrogen, and on combustion yielded numbers agreeing with the formula $C_{20}H_{30}O_3$.

Hesperidine is readily acted on by nitric acid; if undiluted a violent action ensues, a viscid, yellow, tarry substance being formed; but if diluted with its own bulk of water, nitric acid acts more slowly. By long-continued boiling, an inverted condenser being attached, the evolution of red fumes and carbonic acid is noticed for some hours, and then almost ceases; the hydrocarbon is then found to be converted into a brown resin, becoming very soft at 100°, but hard and brittle after cooling. This resin contains a large quantity of nitrogen, and is apparently formed from the original body by addition of oxygen and replacement of hydrogen by NO_2. Its examination is not yet completed.

By the action of stronger nitric acid on this brown resin, a yellow resin not softening at 100°, and containing less carbon and hydrogen, is produced. The formation of this body is accompanied by the production of much oxalic acid, and possibly of a nitrogenized acid, as the snow-white oxalic acid obtained after precipitation, as lead salt, decomposition by hydric sulphide, and several recrystallizations contained nitrogen, and gave numbers on analysis (as well as its silver salt) approximating to, but not agreeing very well with, those required by theory.

On heating 1 part of hesperidine with 30 of water, 1 of sulphuric acid, and 3 of potassium dichromate, a slow evolution of CO_2 is noticed. After some hours boiling with an inverted condenser attached, the majority of the hydrocarbon is apparently unattacked, but on distilling an acid distillate is obtained. This acid, converted into barium salt and silver salt, gave numbers indicating that the acid was essentially acetic. The barium salt also gave all the qualitative reactions of an acetate.

Sulphuric acid and potassium chlorate have a violent action on hesperidine, and produce a viscid tar not yet fully examined.

The PRESIDENT said that this short communication by Professor Wright was only another proof that he was working in the right direction. He seemed to have hit the nail on the very head. This paper accounted for the difficulty they had of preserving the essential oil of orange-peel. No doubt the changes referred to would go to explain the change essential oil of orange-peel undergoes.

Mr. HANBURY said he supposed the gentleman who read the paper had not found the source of this essential oil; whether it was got from home or abroad—from the bitter or sweet orange. He thought it would be interesting to know about that.

Professor WRIGHT said all he knew was that it was received from Piesse and Lubin, from abroad, and that it was as pure a material as could be made. He obtained the article from the firm referred to; but as to the nature of the orange from which it was derived, he was not acquainted with it.

Dr. ATTFIELD said that there were many gentlemen present who would feel as he did, that they should recognize the labours of Professor Wright, by thanking him for his paper. It was one of those gems of research as to which he thought they would be insulting the work of Dr. Wright if they alluded to the mere practical application of such a paper. The practical application of these matters was far lower than the research itself, and sure to follow in the ordinary course of events. As to votes of thanks to authors of papers, it might be well to wait till the end of the meeting, and then thank the authors all at once. Authors of papers themselves generally said that they were so abundantly gratified in making the researches, that they did not care much for the thanks, and were willing to put off to the end of the meeting any recognition of their services in this respect.

It was agreed to postpone giving thanks till the close of the meetings.

The PRESIDENT said that the next paper was one of great ability, on "New Derivatives from Codeia." He was sure that that paper alone would repay them for coming to Edinburgh to hear it.

Professor WRIGHT then read the following paper:—

NEW DERIVATIVES FROM CODEIA.

BY CHARLES R. A. WRIGHT, D.SC.,
Lecturer on Chemistry in St. Mary's Hospital Medical School.

By the action of hydrobromic acid (48 per cent. HBr), on codeia at 100° F., there is produced firstly a base containing the elements of codeia, where OH is replaced by Br; and by a further action two other bases, one containing one atom of oxygen less than codeia, the other having the composition of four molecules of codeia coalesced together, one of the 84 hydrogen atoms in the product being replaced by Br.

Codeia	$C_{18}H_{21}NO_3$
Bromocodeide	$C_{18}H_{20}BrNO_2$
Deoxycodeia	$C_{18}H_{21}NO_2$
Bromotetracodeia . . .	$C_{72}H_{83}BrN_4O_{12}$

The last base is almost insoluble in ether, whereby it can be separated from the other two, which are readily soluble in that menstruum.

The further action of hydrobromic acid on the above bodies gives rise to the substitution of H for CH_3 in them, the following substances being obtainable by this means:—

Deoxymorphia	$C_{17}H_{19}NO_2$
Bromo-dicodeia-dimorphia .	$C_{70}H_{79}BrN_4O_{12}$
Bromotetramorphia . . .	$C_{68}H_{75}BrN_4O_{12}$

When treated with strong hydrochloric acid at the ordinary temperature, the bromine in the tetra-bases described above is replaced by chlorine. Thus, the following bodies have been analysed (*i. e.* their salts):—

Chlorotetracodeia	$C_{72}H_{83}ClN_4O_{12}$
Chloro-dicodeia-dimorphia .	$C_{70}H_{79}ClN_4O_{12}$
Chlorotetramorphia . . .	$C_{68}H_{75}ClN_4O_{12}$

The physiological action of the above bodies does not appear to be very marked. Dr. Michael Foster finds that the above bodies produce in cats a peculiar excitement of the nervous system and paralysis of inhibitory fibres of the pneumogastric. Deoxycodeia and deoxymorphia salts produce also convulsions of an epileptic character. In case these properties should ever cause the substances to be used in medicine, probably a pill would be the most convenient form of exhibition, as the sparing solubility of their salts in water, and the comparatively large dose requisite, would preclude the use of hypodermic injections.

On treating codeia with hydriodic acid (55 per cent. HI) and a sufficiency of phosphorus, methyl iodide is evolved, and a series of products obtained which much resemble one another in physical characters, being amorphous, brittle or tarry bodies. If the action takes place at 100°, 110°–115°, or at higher temperatures up to 130°, the following three substances appear to be produced:—

I. $C_{68}H_{86}I_2N_4O_{12}, 4HI$. at 100°
II. $C_{68}H_{82}I_2N_4O_{10}, 4HI$. at 110°–115°
III. $C_{68}H_{82}I_2N_4O_6, 4HI$. up to 130°.

On boiling up with water, these bodies part with the elements of hydriodic acid, and either lose or take up those of water. Thus, the following substances have been procured:—

IV. $C_{68}H_{81}IN_4O_{10}, 4HI$. from II.
V. $C_{68}H_{80}N_4O_{10}, 4HI$ . . from both I. and II.
VI. $C_{68}H_{88}N_4O_{10}, 4HI$ . . from III.

A similar reaction also appears to take place by precipitating the solutions of I., II., III. with sodium carbonate; in this way the free bases of the compounds IV. and V. have been obtained from I.

Lastly, on treating with hydriodic acid the compounds IV., V., VI., the elements of hydriodic acid and water are taken up, forming compounds not losing the added water even by long-continued exposure to a temperature of 100°. Thus,—

VI. $C_{68}H_{107}I_3N_4O_{22}, 4HI$. from both IV. and V.
VIII. $C_{68}H_{89}IN_4O_{10}, 4HI$ . . from VI.

While, on treating I. with hydriodic and phosphorus, the following compound (containing the elements of hydriodic acid and water more than III.) was produced:—

IX. $C_{68}H_{103}I_3N_4O_{16}, 4HI$.

The physiological action of the foregoing compounds has not yet been examined particularly, but it does not appear to be marked, no ill-effects having been observed while working with the bodies. Names have not yet been given to these substances, owing to their complexity.

The codeia used in the experiments briefly described above formed part of a large supply exceeding twenty ounces, most liberally presented for the purpose by the eminent manufacturing chemists, Messrs. Macfarlane, of Edinburgh.

The PRESIDENT said that the subject had been very clearly explained by Professor Wright, and he considered it was a paper well worthy of being read at the Conference.

Mr. BRADY said he would like to make one remark about Professor Wright's paper, not that he was going to discuss any point, but as it bore on a little experience he had had, it came with a peculiar force in Edinburgh, which was very much the seat of the morphia manufacture, but it was not so much that as the liberality of the manufacturers of the morphia alkaloids in helping scientific men with materials. Some years ago, when Mr. Deane and himself were making experiments in the morphia alkaloids, in an experimental sense, Messrs. T. and H. Smith and Messrs. Macfarlane assisted them by furnishing materials; and he could not sit there without testifying to their extreme kindness, not in matters of business only, but also to their interest in scientific research.

Professor WRIGHT said that Mr. Brady had called to his mind what he ought to have mentioned before, though it would be seen that it had not been overlooked in his paper. He most sincerely returned thanks to the Messrs. Macfarlane, not only for a supply of codeia, but many other alkaloids. The codeia given by Messrs. Macfarlane weighed upwards of twenty ounces.

BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

THE PRESIDENT'S ADDRESS.

(*Concluded from p.* 117.)

Sir William Thomson next spoke of the success of the Kew Magnetic and Meteorological Observatory as affording an example of the great gain to be earned for science by the foundation of physical observatories and laboratories for experimental research, to be conducted by qualified persons, whose duties should be, not teaching, but experimenting. Whether we look to the honour of England, as a nation which ought always to be the foremost in promoting physical science, or to those vast economical advantages which must accrue from such establishments, we cannot but feel that experimental research ought to be made with us an object of national concern, and not left, as hitherto, to the private enterprise of self-sacrificing amateurs, and the necessarily inconsecutive action of our present Governmental Departments and of casual Committees. He referred to a memorial presented by the Council of the Royal Society of Edinburgh to the Royal Commission on Scientific Education and the Advancement of Science, in which occurred the following words:—"On the Continent there exist certain institutions, fitted with instruments, apparatus, chemicals and other appliances, which are meant to be, and which are made available to men of science, to enable them, at a moderate cost, to pursue original researches,"—which he said was corroborated by information he had received from Germany, to the effect that in Prussia "every university, every polytechnical academy, every industrial school (*Realschule* and *Gewerbeschule*), most of the grammar-schools, in a word, nearly all the schools superior in rank to the elementary schools of the common people, are supplied with chemical laboratories and a collection of philosophical instruments and apparatus, access to which is most liberally granted by the directors of those schools, or the teachers of the respective disciplines, to any person qualified, for *scientific experiments*. In consequence, though there exist no particular institutions like those mentioned in the memorial, there will scarcely be found a town exceeding in number 5000 inhabitants but offers the possibility of *scientific explorations* at no other cost than reimbursement of the expense for the materials wasted in the experiments."

The physical laboratories which have grown up in the Universities of Glasgow and Edinburgh, and in Owens College, Manchester, show the want felt of Colleges of Research; but they go but infinitesimally towards supplying it, being absolutely destitute of means, material or personal, for advancing science except at the expense of volunteers, or securing that volunteers shall be found to continue even such little work as at present is carried on.

The whole of Andrews' splendid work in Queen's College, Belfast, has been done under great difficulties and disadvantages and at great personal sacrifices, and up to the present time there is not a student's physical laboratory in any one of the Queen's Colleges in Ireland—a want which surely ought not to remain unsupplied. Each of these institutions (the four Scotch Universities, the three Queen's Colleges, and Owens College, Manchester) requires two professors of natural philosophy—one who shall be responsible for the teaching, the other for the advancement of science by experiment. The

University of Oxford has already established a physical laboratory. The munificence of its Chancellor is about to supply the University of Cambridge with a splendid laboratory, to be constructed under the eye of Professor Clerk Maxwell.

Besides abstracts of papers read and discussions held before the sections, the annual Reports of the British Association contain a large mass of valuable matter of another class. The speaker then alluded to the early practice of the Association, a practice that might well be further developed, to call occasionally for a special report on some particular branch of science from a man eminently qualified for the task. Some of the reports received in compliance with these invitations have done good service in their time, and remain permanently useful as landmarks in the history of science. The two kinds of efficiency realized in this department of the Association's work may be illustrated by referring to Cayley's Report on Abstract Dynamics and Sabine's Report on Terrestrial Magnetism (1838).

He then referred to different investigators of the science of terrestrial magnetism, and said that in Wales, Sir Edward and Lady Sabine are at work on the magnetic chart of the world. If two years of life and health are granted to them, science will be provided with a key which must powerfully conduce to the ultimate opening up of one of the most refractory enigmas of cosmical physics, the cause of terrestrial magnetism.

In giving a sketch of scientific investigation performed during the past year he would simply choose some of those which had struck him as most notable.

Accurate and minute measurement seems to the non-scientific imagination a less lofty and dignified work than looking for something new. But nearly all the grandest discoveries of science have been but the rewards of accurate measurement and patient and long-continued labour in the minute sifting of numerical results. The popular idea of Newton's grandest discovery is that the theory of gravitation flashed into his mind, and so the discovery was made. It was by long train of mathematical calculation, founded on results accumulated through prodigious toil of practical astronomers, that Newton first demonstrated the forces urging the planets towards the sun, determined the magnitudes of those forces, and discovered that a force following the same law of variation with distance urges the moon towards the earth. *Then* first, we may suppose, came to him the idea of the universality of gravitation; but when he attempted to compare the magnitude of the force on the moon with the magnitude of the force of gravitation of a heavy body of equal mass at the earth's surface, he did not find the agreement which the law he was discovering required. Not for years after would he publish his discovery as made. It is recounted that, being present at a meeting of the Royal Society, he heard a paper read, describing geodesic measurement by Picard which led to a serious correction of the previously accepted estimate of the earth's radius. This was what Newton required. He went home with the result and commenced his calculations, but felt so much agitated that he handed over the arithmetical work to a friend: then (and not when, sitting in a garden, he saw an apple fall) did he ascertain that gravitation keeps the moon in her orbit.

Other instances of important results from minute and accurate measurement were mentioned, and an opinion expressed that great service has been done to science by the British Association in promoting accurate measurement in various subjects.

The greatest achievement yet made in molecular theory of the properties of matter is the Kinetic theory of Gases, shadowed forth by Lucretius, definitely stated by Daniel Bernoulli, largely developed by Herapath, made a reality by Joule, and worked out to its present advanced state by Clausius and Maxwell. Joule, from his dynamical equivalent of heat, and his experiments upon the heat produced by the condensation of gas, was able to estimate the average velocity of the ultimate molecules or atoms composing it. His estimate for hydrogen was 6225 feet per second at temperature 60° Fahr., and 6055 feet per second at the freezing-point. Clausius took fully into account the impacts of molecules on one another, and the kinetic energy of *relative* motions of the matter constituting an individual atom. He investigated the relation between their diameters, the number in a given space, and the mean length of path from impact to impact, and so gave the foundation for estimates of the absolute dimensions of atoms, to which I shall refer later. He explained the slowness of gaseous diffusion by the mutual impacts of the atoms, and laid a secure foundation for a complete theory of the diffusion of fluids, previously a most refractory enigma. The deeply penetrating genius of Maxwell brought in viscosity and thermal conductivity, and thus completed the dynamical explanation of all the known properties of gases, except their electric resistance and brittleness to electric force.

No such comprehensive molecular theory had ever been even imagined before the nineteenth century. Definite and complete in its area as it is, it is but a well-drawn part of a great chart, in which all physical science will be represented with every property of matter shown in dynamical relation to the whole. The prospect we now have of an early completion of this chart is based on the assumption of atoms. But there can be no permanent satisfaction to the mind in explaining heat, light, elasticity, diffusion, electricity and magnetism, in gases, liquids, and solids, and describing precisely the relations of these different states of matter to one another by statistics of great numbers of atoms, when the properties of the atom itself are simply assumed. When the theory, of which we have the first instalment in Clausius and Maxwell's work, is complete, we are but brought face to face with a superlatively grand question, what is the inner mechanism of the atom?

In the answer to this question we must find the explanation not only of the atomic elasticity, by which the atom is a chronometric vibrator according to Stokes's discovery, but of chemical affinity and of the differences of quality of different chemical elements, at present a mere mystery in science. Helmholtz's exquisite theory of vortex-motion in an incompressible frictionless liquid has been suggested as a finger-post, pointing a way which may possibly lead to a full understanding of the properties of atoms, carrying out the grand conception of Lucretius, who "admits no subtle ethers, no variety of elements with fiery, or watery, or light, or heavy principles; nor supposes light to be one thing, fire another, electricity a fluid, magnetism a vital principle, but treats all phenomena as mere properties or accidents of simple matter." This statement I take from an admirable paper on the atomic theory of Lucretius, which appeared in the *North British Review* for March, 1868, containing a most instructive summary of ancient and modern doctrine regarding atoms. Allow me to read from that article one other short passage finely describing the present aspect of atomic theory:—"The existence of the chemical atom, already quite a complex little world, seems very probable: and the description of the Lucretian atom is wonderfully applicable to it. We are not wholly without hope that the real weight of each atom may some day be known—not merely the relative weight of the several atoms, but the number in a given volume of any material; that the form and motion of the parts of each atom and the distances by which they are separated may be calculated; that the motions by which they produce heat, electricity, and light may be illustrated by exact geometrical diagrams; and that the fundamental properties of the intermediate and possibly constituent medium may be arrived at. Then the motion of planets and music of the spheres will be neglected for a while in admiration of the maze in which the tiny atoms run."

Even before this was written some of the anticipated results had been partially attained. Loschmidt in Vienna had shown, and not much later Stoney independently in England showed, how to deduce from Clausius and Maxwell's kinetic theory of gases a superior limit to the number of atoms in a given measurable space. I was unfortunately quite unaware of what Loschmidt and Stoney had done when I made a similar estimate on the same foundation, and communicated it to *Nature* in an article on "The Size of Atoms." But questions of personal priority, however interesting they may be to the persons concerned, sink into insignificance in the prospect of any gain of deeper insight into the secrets of nature. The triple coincidence of independent reasoning in this case is valuable as confirmation of a conclusion violently contravening ideas and opinions which had been almost universally held regarding the dimensions of the molecular structure of matter. Chemists and other naturalists had been in the habit of evading questions as to the hardness or indivisibility of atoms by virtually assuming them to be infinitely small and infinitely numerous. We must now no longer look upon the atom, with Boscovich, as a mystic point endowed with inertia and the attribute of attracting or repelling other such centres with forces depending upon the intervening distances (a supposition only tolerated with the tacit assumption that the inertia and attraction of each atom is infinitely small and the number of atoms infinitely great), nor can we agree with those who have attributed to the atom occupation of space with infinite hardness and strength (incredible in any finite body); but we must realize it as a piece of matter of measurable dimensions, with shape, motion, and laws of action, intelligible subjects of scientific investigation.

The prismatic analysis of light discovered by Newton was estimated by himself as being "the oddest, if not the most considerable, detection which hath hitherto been made in the operations of nature."

Had he not been deflected from the subject, he could not have failed to obtain a pure spectrum; but this, with the inevitably consequent discovery of the dark lines, was reserved for the nineteenth century. Our fundamental knowledge of the dark lines is due solely to Fraunhofer. Wollaston saw them, but did not discover them. Brewster laboured long and well to perfect the prismatic analysis of sunlight; and his observations on the dark bands produced by the absorption of interposed gases and vapours laid important foundations for the grand superstructure which he scarcely lived to see. Piazzi Smyth, by spectroscopic observation performed on the Peak of Teneriffe, added greatly to our knowledge of the dark lines produced in the solar spectrum by the absorption of our own atmosphere. The prism became an instrument for chemical qualitative analysis in the hands of Fox Talbot and Herschel, who first showed how, through it, the old "blowpipe test," or generally the estimation of substances from the colours which they give to flames, can be prosecuted with an accuracy and a discriminating power not to be attained when the colour is judged by the unaided eye. But the application of this test to solar and stellar chemistry had never, I believe, been suggested, either directly or indirectly, by any other naturalist, when Stokes taught it to me in Cambridge at some time prior to the summer of 1852. The observational and experimental foundations on which he built were:—

(1) The discovery by Fraunhofer of a coincidence between his double dark line D of the solar spectrum and a double bright line which he observed in the spectra of ordinary artificial flames.

(2) A very rigorous experimental test of this coincidence by Professor W. H. Miller, which showed it to be accurate to an astonishing degree of minuteness.

(3) The fact that the yellow light given out when salt is thrown on burning spirit consists almost solely of the two nearly identical qualities which constitute that double bright line.

(4) Observations made by Stokes himself, which showed the bright line D to be absent in a candle-flame when the wick was snuffed clean, so as not to project into the luminous envelope, and from an alcohol flame when the spirit was burned in a watch-glass. And

(5) Foucault's admirable discovery (L'Institut, Feb. 7, 1849) that the voltaic arc between charcoal points is "a medium which emits the rays D on its own account, and at the same time absorbs them when they come from another quarter."

The conclusions, theoretical and practical, which Stokes taught me, and which I gave regularly afterwards in my public lectures in the University of Glasgow, were:—

(1) That the double line D, whether bright or dark, is due to vapour of sodium.

(2) That the ultimate atom of sodium is susceptible of regular elastic vibrations, like those of a tuning-fork or of stringed musical instruments; that like an instrument with two strings tuned to approximate unison, or an approximately circular elastic disk, it has two fundamental notes or vibrations of approximately equal pitch; and that the periods of these vibrations are precisely the periods of the two slightly different yellow lights constituting the double bright line D.

(3) That when vapour of sodium is at a high enough temperature to become itself a source of light, each atom executes these two fundamental vibrations simultaneously; and that, therefore, the light proceeding from it is of the two qualities constituting the double bright line D.

(4) That when vapour of sodium is present in space across which light from another source is propagated, its atoms, according to a well-known general principle of dynamics, are set to vibrate in either or both of those fundamental modes, if some of the incident light is of one or other of their periods, or some of one and some of the other; so that the energy of the waves of those particular qualities of light is converted into thermal vibrations of the medium and dispersed in all directions, while light of all other qualities, even though very nearly agreeing with them, is transmitted with comparatively no loss.

(5) That Fraunhofer's double dark line D of solar and stellar spectra is due to the presence of vapour of sodium in atmospheres surrounding the sun and those stars in whose spectra it had been observed.

(6) That other vapours than sodium are to be found in the atmospheres of the sun and stars by searching for substances producing in the spectra of artificial flames bright lines coinciding with other dark lines of the solar and stellar spectra than the Fraunhofer line D.

The last of these propositions I felt to be confirmed (it was perhaps partly suggested) by a striking and beautiful experiment admirably adapted for lecture illustrations, due to Foucault, which had been shown to me by M. Duboscque Soleil, and the Abbé Moigno, in Paris in the month of October, 1850. A prism and lenses were arranged to throw upon a screen an approximately pure spectrum of a vertical electric arc between charcoal poles of a powerful battery, the lower one of which was hollowed like a cup. When pieces of copper and pieces of zinc were separately thrown into the cup, the spectrum exhibited, in perfectly definite positions, magnificent well-marked bands of different colours characteristic of the two metals. When a piece of brass, compounded of copper and zinc, was put into the cup, the spectrum showed all the bands, each precisely in the place in which it had been seen when one metal or the other had been used separately.

To Kirchhoff belongs, I believe, solely the great credit of having first actually sought for and found other metals than sodium in the sun by the method of spectrum analysis. His publication of October, 1859, inaugurated the practice of solar and stellar chemistry, and gave spectrum analysis an impulse to which, in a great measure, is due its splendidly successful cultivation by the labours of many able investigators within the last ten years.

To prodigious and wearing toil of Kirchhoff himself, and of Angström, we owe large-scale maps of the solar spectrum, incomparably superior, in minuteness and accuracy of delineation, to anything ever attempted previously. These maps now constitute the standards of reference for all workers in the field. Plücker and Hittorf opened ground in advancing the physics of spectrum analysis and made the important discovery of changes in the spectra of ignited gases, produced by changes in the physical condition of the gas. The scientific value of the meetings of the British Association is well illustrated by the fact that it was through conversation with Plücker, at the Newcastle meeting, that Lockyer was first led into the investigation of the effects of varied pressure on the quality of the light emitted by glowing gas, which he and Frankland have prosecuted with such admirable success. Scientific wealth tends to accumulation according to the law of compound interest. Every addition to knowledge of properties of matter supplies the naturalist with new instrumental means for discovering and interpreting phenomena of nature, which in their turn afford foundations for fresh generalizations, bringing gains of permanent value into the great storehouse of philosophy. Thus Frankland, led, from observing the want of brightness of a candle burning in a tent on the summit of Mont Blanc, to scrutinize Davy's theory of flame, discovered that brightness, without incandescent solid particles, is given to a purely gaseous flame by augmented pressure, and that a dense ignited gas gives a spectrum comparable with that of the light from an incandescent solid or liquid. Lockyer joined him, and the two found that every incandescent substance gives a continuous spectrum; that an incandescent gas under varied pressure gives bright bars across the continuous spectrum, some of which, from the sharp, hard and fast lines observed where the gas is in a state of extreme attenuation, broaden out on each side into nebulous bands as the density is increased, and are ultimately lost in the continuous spectrum when the condensation is pushed on till the gas becomes a fluid no longer to be called gaseous. More recently they have examined the influence of temperature, and have obtained results which seem to show that a highly attenuated gas, which at a high temperature gives several bright lines, gives a smaller and smaller number of lines, of sufficient brightness to be visible, when the temperature is lowered, the density being kept unchanged.

Stokes's dynamical theory supplies the key to the philosophy of Frankland and Lockyer's discovery. Any atom of gas when struck and left to itself vibrates with perfect purity its fundamental note or notes. In a highly attenuated gas each atom is very rarely in collision with other atoms, and therefore is nearly at all times in a state of true vibration. Hence the spectrum of a highly attenuated gas consists of one or more perfectly sharp bright lines, with a scarcely perceptible continuous gradation of prismatic colour. In denser gas each atom is frequently in collision, but still is for much more time free, in intervals between collisions, than engaged in collision; so that not only is the atom itself thrown sensibly out of tune during a sensible proportion of its whole time, but the confused jangle of vibrations in every variety of period during the actual collision becomes more considerable in its influence. Hence bright lines in the spectrum broaden out somewhat, and the continuous spectrum becomes less faint. In still denser gas each atom may be almost as much time in collision as free, and the spectrum then consists of broad nebulous bands crossing a continuous spectrum of considerable brightness. When the medium is so dense that each atom is always in collision—that is to say, never free from influence of its neighbours—the spectrum will generally be continuous, and may present little or no appearance of bands, or even of maxima of brightness. In this condition the fluid can be no longer regarded as a gas, and we must judge of its relation to the vaporous or liquid states according to the critical conditions discovered by Andrews.

While these great investigations of properties of matter were going on, naturalists were not idle with the newly-recognized power of the spectroscope at their service. Chemists soon followed the example of Bunsen in discovering new metals in terrestrial matter by the old blow-pipe and prism test of Fox Talbot and Herschel. Biologists applied spectrum analysis to animal and vegetable chemistry, and to sanitary investigations. But it is in astronomy that spectroscopic research has been carried on with the greatest activity, and been most richly rewarded with results. The chemist and the astronomer have joined their forces. An astronomical observatory has now appended to it a stock of reagents such as hitherto was only to be found in the chemical laboratory. A devoted corps of volunteers of all nations, whose motto might well be *ubique*, have directed their artillery to every region of the universe. The sun, the spots on his surface, the corona and the red and yellow prominences seen round him during total eclipses, the moon, the planets, comets, auroras, nebulæ, white stars, yellow stars, red stars, variable and temporary stars, each tested by the prism was compelled to show its distinguishing prismatic colours. Rarely before in the history of science has enthusiastic perseverance, directed by penetrative genius, produced within ten years so brilliant a succession of discoveries. It is not merely the *chemistry* of sun and stars, as first suggested, that is subjected to analysis by the spectroscope. Their whole laws of being are now subjects of direct investigation; and already we have glimpses of their evolutional history through the stupendous power of this most subtle and delicate test. We had only solar and stellar chemistry; we now have solar and stellar physiology.

It is an old idea that the colour of a star may be influenced by its motion relatively to the eye of the spectator, so as to be tinged with red if it moves from the earth, or blue if it moves towards the earth. William Allen Miller, Huggins and Maxwell showed how, by aid of the spectroscope, this idea may be made the foundation of a method of measuring the relative velocity with which a star approaches to or recedes from the earth. The principle is, first to identify, if possible, one or more of the lines in the spectrum of the star, with a line or lines in the spectrum of sodium, or some other terrestrial substance, and then (by observing the star and the artificial light simultaneously by the same spectroscope) to find the difference, if any, between their refrangibilities. From this difference of refrangibility the ratio of the periods of the two lights is calculated, according to data determined by Fraunhofer from comparisons between the positions of the dark lines in the prismatic spectrum and in his own "interference spectrum" (produced by substituting for the prism a fine grating). A first comparatively rough application of the test by Miller and Huggins to a large number of the principal stars of our skies, proved that not one of them had so great a velocity as 315 kilometres per second to or from the earth, which is a *most momentous result in respect to cosmical dynamics.* Afterwards Huggins made special observations of the velocity test, and succeeded in making the measurement in one case, that of Sirius, which he then found to be receding from the earth at the rate of 66 kilometres per second. This, corrected for the velocity of the earth at the time of the observation, gave a velocity of Sirius, relatively to the sun, amounting to 47 kilometres per second.

During six or eight precious minutes of time, spectroscopes have been applied to the solar atmosphere and to the corona seen round the dark disk of the moon eclipsing the sun. Some of the wonderful results of such observations, made in India on the occasion of the eclipse of August, 1868, were described by Professor Stokes in a previous address. Valuable results have, through the liberal assistance given by the British and American Governments, been obtained also from the total eclipse of last December, notwithstanding a generally unfavourable condition of weather. It seems to have been proved that at least some sensible part of the light of the "corona" is a terrestrial atmospheric halo or dispersive reflection of the light of the glowing hydrogen and "helium"* round the sun.

The speaker, referring to former hypotheses concerning the solar system, and specially to Mayer's theory that the sun's heat is supplied dynamically from year to year by the influx of meteors, said that now spectrum analysis gives proof finally conclusive against it.

Most important steps have been recently made towards the discovery of the nature of comets; establishing with nothing short of certainty the truth of a hypothesis which had long appeared to me probable,—that they consist of groups of meteoric stones; accounting satisfactorily for the light of the nucleus; and giving a simple and rational explanation of phenomena presented by the tails of comets which had been regarded by the greatest astronomers as almost preternaturally marvellous. The investigations of Professor Newton, of Yale College, United States, followed and completed by those of Adams, proved that Temple's Comet I., 1866, consists of an elliptic train of minute planets, of which a few thousands or millions fall to the earth annually about the 14th of November, when we cross their track. We have probably not yet passed through the very nucleus or densest part; but thirteen times, in Octobers and Novembers, from October 13, A.D. 902, to November 14, 1866, inclusive (this last time having been correctly predicted by Professor Newton), we have passed through a part of the belt greatly denser than the average. The densest part of the train, when near enough to us, is visible as the head of the comet.

The essence of science, as is well illustrated by astronomy and cosmical physics, consists in inferring antecedent conditions, and anticipating future evolutions, from phenomena which have actually come under observation. In biology the difficulties of successfully acting up to this ideal are prodigious. The earnest naturalists of the present day are, however, not appalled or paralysed by them, and are struggling boldly and laboriously to pass out of the mere "natural history" stage of their study, and bring zoology within the range of natural philosophy. A very ancient speculation, still clung to by many naturalists (so much so that I have a choice of modern terms to quote in expressing it), supposes that, under meteorological conditions very different from the present, dead matter may have run together or crystallized or fermented into "germs of life," or "organic cells," or "protoplasm." But science brings a vast mass of inductive evidence against this hypothesis of spontaneous generation, as you have heard from my predecessor in the presidential chair. Careful enough scrutiny has, in every case up to the present day, discovered life as antecedent to life. Dead matter cannot become living without coming under the influence of matter previously alive. This seems to me as sure a teaching of science as the law of gravitation. I utterly repudiate, as opposed to all philosophical uniformitarianism, the assumption of "different meteorological conditions,"—that is to say, somewhat different vicissitudes of temperature, pressure, moisture, gaseous atmosphere,—to produce or to permit that to take place by force or motion of dead matter alone, which is a direct contravention of what seems to us biological law. I am prepared for the answer, "our code of biological law is an expression of our ignorance as well as of our knowledge." And I say yes: search for spontaneous generation out of inorganic materials; let any one not satisfied with the purely negative testimony of which we have now so much against it, throw himself into the inquiry. Such investigations as those of Pasteur, Pouchet and Bastian are among the most interesting and momentous in the whole range of natural history; and their results, whether positive or negative, must richly reward the most careful and laborious experimenting. I confess to being deeply impressed by the evidence put before us by Professor Huxley, and I am ready to adopt, as an article of scientific faith, true through all space and through all time, that life proceeds from life, and from nothing but life.

How, then, did life originate on the earth? Tracing the physical history of the earth backwards, on strict dynamical principles, we are brought to a red-hot melted globe on which no life could exist. Hence, when the earth was first fit for life, there was no living thing on it. There were rocks solid and disintegrated, water, air all round, warmed and illuminated by a brilliant sun, ready to become a garden. Did grass and trees and flowers spring into existence, in all the fulness of ripe beauty, by a fiat of Creative Power? or did vegetation, growing up from seed sown, spread and multiply over the whole earth? Science is bound, by the everlasting law of honour, to face fearlessly every problem which can fairly be presented to it. If a probable solution, consistent with the ordinary course of nature, can be found, we must not invoke an abnormal act of Creative Power. When a lava-stream flows down the sides of Vesuvius or Etna, it quickly cools and becomes solid; and after a few weeks or years it teems with vegetable and animal life, which for it originated by the transport of seed and ova, and by the migration of individual living creatures. When a volcanic island springs up from the sea, and after a few years is found clothed with vegetation, we do not hesitate to assume that seed has been wafted to it through the air, or floated to it on rafts. Is it not possible, and, if possible, is it not probable, that the beginning of vegetable life on the earth is to be similarly explained? Every year thousands, probably millions, of fragments of solid matter fall upon the earth: whence came these fragments? What is the previous history of any one of them? Was it created in the beginning of time an amorphous mass? This idea is so unacceptable that, tacitly or explicitly, all men discard it. It is often assumed that all, and it is certain that some, meteoric stones are fragments which had been broken off from greater masses and launched free into space. It is as sure that collisions must occur between great masses moving through space as it is that ships, steered without intelligence directed to prevent collision, could not cross and recross the Atlantic for thousands of years with immunity from collisions. When two great masses come into collision in space it is certain that a large part of each is melted; but it seems also quite certain that in many cases a large quantity of *débris* must be shot forth in all directions, much of which may have experienced no greater violence than individual pieces of rock experience in a land-slip or in blasting by gunpowder. Should the time when this earth comes into collision with another body, comparable in dimensions to itself, be when it is still clothed as at present with vegetation, many great and small fragments carrying seed and living plants and animals would undoubtedly be scattered through space. Hence and because we all confidently believe that there are at present, and have been from time immemorial, many worlds of life besides our own, we must regard it as probable in the highest degree that there are countless seed-bearing meteoric stones moving about through space. If at the present instant no life existed upon this earth, one such stone falling upon it might, by what we blindly call *natural* causes, lead to its becoming covered with vegetation. I am fully conscious

* Frankland and Lockyer find the yellow prominences to give a very decided bright line not far from D, but hitherto not identified with any terrestrial flame. It seems to indicate a new substance, which they propose to call helium.

of the many scientific objections which may be urged against this hypothesis, but I believe them to be all answerable. I have already taxed your patience too severely to allow me to think of discussing any of them on the present occasion. The hypothesis that life originated on this earth through moss-grown fragments from the ruins of another world may seem wild and visionary; all I maintain is that it is not unscientific.

From the earth stocked with such vegetation as it could receive meteorically, to the earth teeming with all the endless variety of plants and animals which now inhabit it, the step is prodigious; yet, according to the doctrine of continuity, most ably laid before the Association by a predecessor in this chair (Mr. Grove), all creatures now living on earth have proceeded by orderly evolution from some such origin. Darwin concludes his great work on 'The Origin of Species' with the following words:—"It is interesting to contemplate an entangled bank clothed with many plants of many kinds, with birds singing on the bushes, with various insects flitting about, and with worms crawling through the damp earth, and to reflect that these elaborately constructed forms, so different from each other, and dependent on each other in so complex a manner, have all been produced by laws acting around us." . . . . "There is grandeur in this view of life with its several powers, having been originally breathed by the Creator into a few forms or into one; and that, whilst this planet has gone cycling on according to the fixed law of gravity, from so simple a beginning endless forms, most beautiful and most wonderful, have been and are being evolved." With the feeling expressed in these two sentences I most cordially sympathize. I have omitted two sentences which come between them, describing briefly the hypothesis of "the origin of species by natural selection," because I have always felt that this hypothesis does not contain the true theory of evolution, if evolution there has been, in biology. Sir John Herschel, in expressing a favourable judgment on the hypothesis of zoological evolution, with, however, some reservation in respect to the origin of man, objected to the doctrine of natural selection, that it was too like the Laputan method of making books, and that it did not sufficiently take into account a continually guiding and controlling intelligence. This seems to me a most valuable and instructive criticism. I feel profoundly convinced that the argument of design has been greatly too much lost sight of in recent zoological speculations. Reaction against the frivolities of teleology, such as are to be found, not rarely, in the notes of the learned commentators on Paley's 'Natural Theology,' has, I believe, had a temporary effect in turning attention from the solid and irrefragable argument so well put forward in that excellent old book. But overpoweringly strong proofs of intelligent and benevolent design lie all round us, and if ever perplexities, whether metaphysical or scientific, turn us away from them for a time, they come back upon us with irresistible force, showing to us through nature the influence of a free will, and teaching us that all living beings depend on one ever-acting Creator and Ruler.

Parliamentary and Law Proceedings.

Alleged Death through taking "Vegetable Pills."

An inquest was held at Bridlington Quay, on the 18th ult., to inquire into the cause of death of Miss Anne Dowsland, who was found dead at her residence on the previous Sunday. From the evidence, it appeared that the deceased had complained to her neighbours of bad health, and suffered from asthma and shortness of breath. On the Saturday week previous to her death she had been called upon by Mr. Robinson, of Hull, from whom she had previously received a circular, and persuaded by him to purchase a box of his pills, which he said would do her more good than anything. She took three pills in water the first night, two on the Monday night, and two on Tuesday morning, after which she was very much purged up to the time of her death.

Mr. Robinson, having been cautioned, said that he was a "medical herbalist," residing in Grimsby Lane, Market Place, Hull. He called on the deceased, who complained of a pressure and gathering of wind at the chest and stomach and costiveness, and sold her a box of his "vegetable pills." He saw she was very low and weak, and advised her to take rice and boiled milk, and a tablespoonful of raw Jamaica rum in the middle of the forenoon; he also gave directions as to the time and way the pills should be taken. The ingredients of the pills were jalap, aloes, ginger, half a drachm of cayenne or capsicum in a 2 lb. mass, with carbonate of soda and simple syrup. In answer to a juror, witness said he had taken six similar pills on Saturday night previous and six on the following morning without sustaining any injurious consequences. The diet he prescribed was intended as a corrective to any purgative action. He did not prescribe the pills for every class of ailment.

The medical gentlemen who had conducted a *post-mortem* examination gave evidence as to the state of the body. They were of opinion that the diseased state of the lungs must eventually have proved fatal, but that drastic purgatives would have a depressing effect upon a person suffering from extreme exhaustion; and that under the circumstances the taking of these pills would have had a tendency to accelerate death.

The jury returned a verdict of "Death from natural causes, accelerated by incautiously taking purgative medicine."

We are informed that after the conclusion of the inquest Mr. Robinson was arrested by the police, on a warrant charging him with manslaughter. Some of the pills were forwarded to an analyst for examination.

Poisoning of a Family by Prussic Acid.

A case of poisoning occurred at Glasgow, on Thursday, August 5th, in which three children and their father died from the effects of prussic acid. It appears that the father, Mr. Nimmo, in a fit of mental aberration, mixed some prussic acid with wine, which he gave to four of his children, aged respectively 7 years, 5 years, 3 years, and 20 months. A servant, attracted by the moaning of the youngest child, went into the room, and saw the father bending over the bed. He made an excuse, which satisfied her for the time, but on going to the other children she saw there was something wrong, and gave the alarm. Assistance was immediately obtained, when the three youngest children and Mr. Nimmo were found to be dead. The eldest child had been offered some wine by his father, but he only tasted it, and, disliking it, would not take any more. The glass was afterwards found to contain a mixture of wine and prussic acid. This child has since recovered.

Mr. Nimmo is said to have obtained the prussic acid from a firm in Glasgow which was in the habit of supplying him with goods necessary for his business, stating that he wanted it for use in a chemical process. A member of the firm took the precaution to go to Kilsyth, where the deceased had just erected a millboard factory, and deliver the prussic acid to him in person. At the same time, he warned Mr. Nimmo that, being required, as he alleged, for experimental purposes, it was of the strongest manufacture, and extreme caution would be required in its use.

Poisoning by an Overdose of Morphia.

An inquest has been held at Sidmouth to inquire into the death of Mr. William Ellis Wall, a private gentleman, residing at Salcombe Regis.

Mrs. Wall, the widow, deposed to the deceased having, about two o'clock on Saturday afternoon, written out a prescription, and sent it by a servant to Mr. Webber, chemist, to be made up. He then went to bed, and, not having received the draught, he sent the girl again to Mr. Webber's at nine o'clock to fetch it. The girl brought back a bottle (which was produced), and, following the directions on the bottle and her husband's previous directions, she gave him one-half of the mixture immediately. Directly afterwards, the housemaid came to say that the wrong medicine had been sent. In about five minutes her husband began to breathe unnaturally. She sent for Dr. M'Kenzie, who, however, had nearly reached the house with Dr. Atkins, and met the servant in the drive. Mrs. Wall said that her husband was in the habit of taking opium, and of prescribing for himself. He had taken but little substantial food during that or the previous day, but on Saturday had drunk three large bottles of champagne.

Jane Shepherd, the servant already mentioned, said she was sent with the prescription by her master in the afternoon, and again in the evening, when Mr. Robert Webber prepared the mixture in her presence. Shortly after, a messenger brought a bottle to the house, saying that Mr. Webber had sent the wrong draught, and requiring to have the previous mixture returned.

Walter Pinn, an apprentice, said he was directed by Mr. Robert Webber, about twenty-five minutes to ten, to go as quickly as possible to Mr. Wall's with a bottle, and to say that the wrong medicine had been sent, which he was to bring back immediately. On his return, about ten minutes after, he was sent to ask Dr. M'Kenzie to come to Mr. Webber's.

Dr. M'Kenzie stated that he was sent for at about twenty minutes to ten to go to Mr. Webber's, and that on his arrival Mr. Webber told him that he had made a mistake, and that instead of putting in half a drachm of solution (equal to half a grain) of muriate of morphia, he had put in a scruple (equal to 20 grains) of the drug, half of which quantity would kill any habitual morphia taker. Dr. Atkins was in the shop, and they both hastened to Mr. Wall's, taking materials for a powerful emetic. Dr. M'Kenzie described Mr. Wall's symptoms when he first saw him, and the remedies which were applied. Mr. Wall died about a quarter-past three on Sunday morning. He had made a *post-mortem* examination, and had no doubt that death was caused by an overdose of morphia. Mr. R. Webber was in the room the whole of the time, rendering any assistance that was in his power.

Confirmatory evidence having been given by Drs. Hodges and Atkins, the coroner, in summing up, said that the evidence clearly established that death was caused by an overdose of morphia prepared by Mr. R. Webber; and pointed out that if a man undertook an office requiring care and skill, and by his want of skill or negligence caused the death of another, the law held him guilty of manslaughter; and it would be for the jury to consider whether the prescription had been prepared with the skill and care the law required, and find their verdict accordingly.

The jury, in about a quarter of an hour, found a verdict of "Death by misadventure," requesting the coroner to admonish Mr. Webber to be more careful for the future, which he did.—*Tiverton Gazette and East Devon Herald.*

[*** We are informed that Mr. Charles Webber, the principal, was absent from home through indisposition, and that Mr. Robert Webber, a younger brother, was left in charge of the business.—Ed. Pharm. Journ.]

Poisoning by Carbolic Acid.

An inquest was held on Tuesday, at Salford, concerning the death of Isabella Storks, aged one year and ten months. The mother of the deceased said her husband was a private soldier, now with his regiment. She resided in St. John's Wood. Some carbolic acid was received from the nuisance department for the purpose of disinfecting the house where a case of smallpox had recently occurred. Part of it had been used and the remainder was left in a bottle, and placed amongst other similar bottles in a cupboard. The child got to the cupboard and drank some of the acid in the bottle. She became very ill, and was shortly afterwards removed to the Infirmary where she died.

Dr. Syson, Medical Officer of Health for Salford, was present at the inquiry, and said the carbolic acid in the bottle produced was in a crude state. He had given strict instructions that it should not be left in that state at any house, but that the nuisance officers should take it to the houses and dilute it there before it was handed to the occupants for use. The officer who took the acid to the house in question was at present away on leave.

The jury returned a verdict of "Accidental death," and, at their request, Dr. Syson promised to make further inquiries into the matter, and report to the committee if he considered the conduct of the nuisance officer rendered such a step necessary.—*Manchester Courier.*

Poisoning by an Overdose of Laudanum.

An inquest was held Friday, August 4, concerning the death of a child two years old, daughter of George Whittaker, residing in Pendleton. It appeared that a nurse that had been in attendance upon the child, who was suffering from a severe cough, recommended the mother to give it a dose of paregoric and aniseed. By a mistake laudanum and aniseed was purchased from the chemist's, and some of the mixture was administered to the child, who died in consequence. After several witnesses had been examined, the jury returned a verdict of "Accidental death."—*Manchester Courier.*

Cambridge Poisoning Case.

There was a further remand of the prisoner in this case, to enable Professor Liveing to confer with Dr. Letheby respecting the different results arrived at by the two analysts.

BOOKS RECEIVED.

On the Source of the Radix Galangæ Minoris of Pharmacologists. By Henry Fletcher Hance, Ph.D. From D. Hanbury, Esq.

Historical Notes on the Radix Galangæ of Pharmacy. By Daniel Hanbury, Esq. From the Author.

Des Rhubarbes. Thèse présentée et soutenue à l'École supérieure de Pharmacie de Paris, pour obtenir le diplôme de Pharmacien de Première Classe. Par Eugène Collin. Paris: 1871. From Professor J. L. Soubeiran.

The following journals have been received:—The 'British Medical Journal,' Aug. 5; the 'Medical Times and Gazette,' Aug. 5; the 'Lancet,' Aug. 5; the 'Medical Press and Circular,' Aug. 9; 'Nature,' Aug. 3; the 'Chemical News,' Aug. 5; 'Gardeners' Chronicle,' Aug. 5; the 'Journal of the Society of Arts,' Aug. 5; the 'Grocer,' Aug. 5; 'Produce Markets Review,' Aug. 5; the 'English Mechanic,' Aug. 4; 'Journal de Pharmacie et de Chimie' for April, May and June; 'Proceedings of the Royal Institution;' 'Chicago Pharmacist' for July; 'Practitioner' for August; 'British Journal of Dental Science' for August.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

The Act to Prevent the Use of Stills by Unlicensed Persons.

Sir,—A good deal has been lately said *pro* and *con.* as to whether the word "may" in a certain clause of the Pharmacy Act, referring to future regulations for keeping, dispensing, etc., of poisons," bears the same meaning as "shall" or "must." I am one of those who are decidedly of opinion that they bear, and were intended to bear, this obligatory meaning.

There is, however, another Act of Parliament, in which chemists are interested, where the same word occurs, and as it appears to me, bears the same meaning as in the former case.

In the "Act to Prevent the Use of Stills by Unlicensed Persons," there is contained this clause, "Provided always, that the Commissioners of Excise 'may' permit the keeping and using of any still or stills for experiments in chemistry under such regulations as they think fit; provided also, that the Commissioners of Excise 'may' permit the keeping and using of any still or stills by persons carrying on trade or otherwise, for the manufacture of articles other than spirits or spirit mixtures upon every person who has a still giving notice thereof to the nearest officer of Excise, and conforming to such regulations as the Commissioners of Excise think fit to direct before beginning to use any still as last aforesaid."

Now, if these exceptional provisions mean anything, they mean that pharmaceutists (who carry on trade), as well as scientific chemists, professors and others (who do not carry on trade), are entitled to exemption from the licence duty of 10*s.* upon every retort and still kept and used for purposes of scientific investigation, or in making the preparations of the P. B. other than spirits and spirit mixtures.

The Commissioners and their officials, however, in direct opposition to the intentions of the Legislature, insist upon the licence duty being paid in all cases where the still or retort is used for purposes of trade,—this being the purport of the reply I received, first, from the officer of the district, and afterwards from the Board of Inland Revenue, on direct application being made for permission to keep a 1 gall. still exclusively for the preparation of distilled water. Of course this is an article of primary necessity to all engaged in the preparation and dispensing of medicines, and no obstacle should be thrown in the way of any one so engaged, who wishes strictly to comply with the directions of the Pharmacopœia.

I think the matter is one of sufficient importance to be brought under the notice of the Council, for the purpose of ascertaining the meaning of "may permit;" whether it means, "will not permit" under any circumstances, or "shall permit" in such cases as ours.—Aqua Destillata.

Preparation for Passing the Examinations.

Sir,—I see, with much regret, that thirty-five out of sixty candidates failed to pass the Minor examination on the 12th, 14th, and 19th of July. Surely it is time that our young men should know better how to prepare for this ordeal, and that their masters should urge upon them the need for *real and fundamental preparation*, rather than the cramming which I have no doubt the examiners easily detect.

Some years since Mr. Ince advised the study of a language, in order to prepare the mind for the sciences a chemist must acquire, but, having tried the plan, I would rather advise, as I do to my own pupils, the study of practical and systematic botany at as early a period as may be possible; this, with a master's occasional supervision, leads to so much instruction about the drugs belonging to the same Natural Orders as the plants under notice, that botany becomes a pleasant and easy commencement of materia medica, into which study the pupil gradually passes as winter approaches and flowers become scarce. Once started in Pereira or Royle, he works away, reminded at nearly every page of his work done in the summer, gathering knowledge as he reads, and has difficult passages explained, until he reaches the second or third winter, by which time he has gained in the shop sufficient acquaintance with trade chemicals to give an interest to chemistry.

A schedule, *drawn up by himself*, showing, in parallel columns, the symbols, equivalent numbers, and specific gravities of elementary substances is a great help to a student of chemistry; it should hang where it can be easily seen, and be learnt as perfectly as possible.

Structural botany may be read alternately with chemistry.

Practical pharmacy is best learned behind the counter.

I cannot too strongly recommend the practice of making notes whilst reading, and of asking for advice or explanation whenever it is needed. This shows a master that his pupil is trying to help himself, and promotes good feeling on both sides; let it be understood that apprentices may read when business permits, the earnest ones will find time for it without neglecting their other duties, and when the examiners' lists appear we shall see their names rank high "in order of merit."

Perhaps some of the examiners, past or present, will favour us with their opinion on this subject.

10, *High Street, Crediton, Devon, July* 31*st*, 1871. William Jackson.

The Pharmacy Bill.

Sir,—The statements made at the last meeting of Council by Mr. Groves, Mr. Smith and Mr. Sandford, as to the ignorance which prevails in the country upon the provisions of the late Pharmacy Amendment Bill, are singularly confirmed by the correspondence in the last two numbers of the Journal. Mr. Mayhew in the number for July 29th, and Mr. Bell in the current number, protest against the inspection threatened by that Bill! Would it surprise those gentlemen very much to learn that inspection is not so much as named in the Bill?

It is fair to assume that gentlemen, who have published forcible letters upon the subject, have taken a more than ordinarily intelligent interest in the course of events; and it is with no disrespect to them that I note their not insignificant mistake. Incredible as it may seem, I believe that a majority of the petitioners against the Bill were equally ill-informed as to its provisions, and that still greater misapprehension prevailed as to the negotiations of which the poison regulations were the sequel.

Loyalty to pharmacy will now be best shown by allowing excited feelings to subside, and to make way for calmer influences. When the atmosphere shall have recovered its natural serenity, there may still be an opportunity for conciliatory and united action before a new Bill can be submitted to Parliament. In the meantime, I would willingly assent to inspection—of the editorial sanctum—with despotic powers of fine and imprisonment, if you, Sir, should allow your good nature again so far to overcome your better instincts as to insert any more combustible correspondence.

I beg to conclude by moving "the previous question," viz. Scientific pharmacy,—too long banished from its happy home.

52, *Royal York Crescent, Clifton, August* 8*th*, 1871. Rich. W. Giles.

Sir,—In your last number Mr. Sandford refers to me at considerable length, and I must ask permission to reply. In his letter Mr. Sandford says, "When I look back to the narrow majority which the non-regulationists obtained at the Annual Meeting, I think we may still claim to represent our constituents." By the use of this argument Mr. Sandford says, just as if he declared it in more direct words, that he believes the division to which he refers was a trial of strength taken under fair conditions. Now, what are the facts? Firstly, that the opponents of the regulations protested, in the most definite manner, against the consideration of compulsory regulations at the Annual Meeting, because the Council and the Journal had assured the country members that compulsory regulations were withdrawn. But, secondly, the fact that that meeting could not consider compulsion, without a breach of good faith towards absent members, was shown by the speeches of the following gentlemen belonging to the pro-regulation party:—Mr. Mackay said, "I say it most emphatically, it would have been a much fairer course for the gentleman who has so ably and eloquently pleaded for this amendment, if due notice had been given of it."

Mr. M. then spoke as to deputations that would have attended had this been the case, and concluded most impressively thus,—"I say it is specially unfair, and I use the word with due consideration, to many country gentlemen, who are as deeply interested in this question as we are, to push the question of this amendment to a vote. So strongly do I feel upon this point, that if the amendment is pressed I may move the adjournment of the meeting."

The venerable Mr. Waugh spoke with great warmth upon the attempt "to steal a march," and concluded by begging that the amendment might not be passed. Mr. Randall was equally emphatic upon the impropriety of attempting to pass such a resolution at a meeting which had received no public notice of it. With such expressions from honourable opponents there can be no doubt as to the merits of the point in question. It is not for me to gauge the allowance due to those regulationists who, in the heat of argument, failed to see the limitation thus imposed; but some such allowance might be claimed for them, which is not due to the deliberate and repeated attempt to represent the vote of the Annual Meeting for something which it was not. This misrepresentation of the fact had been employed towards the Right Hon. W. E. Forster, and is reproduced in Mr. Sandford's circular of July 10. What can that cause be that requires such *suppressio veri* and *suggestio falsi?* I have now made good my late charge of employing "questionable means" so far as one argument is concerned.

Mr. Sandford has attempted to prove too much. He reminds one of the devoted fox-hunter, who argued for his favourite sport that "the men liked it, the horses liked it, the dogs liked it, and it wasn't quite proved that the fox didn't like it!" That there was no such special liking in the House of Commons for the Pharmacy Bill was sufficiently shown by the statement of the *Daily News,* that its withdrawal was received with general approbation.

As Mr. Sandford fears a state of "intolerable terrorism" as a consequence of our present simple form of representative government, it is only just to his forethought to say that he had anticipated its incompatibility with such paternal rule as he seems to think best for us. In the original Bill of 1868 a *coup d'état* was attempted, which would have changed the basis of the Society's government; and it was very late indeed when public attention was called to the fact that the Bill allowed to that 80 per cent. of the members belonging to the provinces just one-third of the seats at the Society's Council, whilst two-thirds were reserved for those who possessed the many graces consequent upon living within ten miles of the General Post-Office. The local secretaries stepped in at this critical period, and the revolutionary attempt was quietly thwarted; but whenever our representative system is discussed, this fact deserves record. I do not hesitate to say that the existence of various Associations, formed specially to agitate questions of trade policy, is a great evil; but at present it is a necessary one, and the constitutional corrective lies in the annual elections. It is more difficult to suggest a remedy for a representative who feels "terror" of his constituents.

I have been sometimes asked by opponents of the late Bill why we should not accept it, and freely use our power of amending schedule A, so that it should embrace only a few undoubted "poisons"? This is a very natural question, and the answer suggests new aspects of the subject. The reason why a sweeping reduction of schedule A would be impossible is, that it would practically destroy the prohibitive power of the Act of 1868. Where that Act forbids a man to use a particular title, it is of very little consequence, for probably the words "medical hall" over his door would bring him more pence. But when the Act forbids him to sell anything comprised in schedule A, its reality and the intention of Parliament to confine the sale of powerful medicines to a qualified class of men is shown. Suppose that you interpret schedule A as not including paregoric elixir (although that medicine has constantly caused the death of infants), the effect is to throw open the sale of paregoric elixir to every huckster in the kingdom, and thus defeat the intention of Parliament. It seems hardly credible that Mr. Sandford should, by treating paregoric elixir as not being a poison within the meaning of the Act, have contributed to defeat one great object of Parliament. As to the fact that we are all left in a state of doubt whether paregoric elixir is a legal "poison," and whether fines of £5 belong to it or not, I can only say that any future Bill open to such doubts will be quickly seen through in the House of Commons, although it may not be transparent to those who are wilfully blind.

Leeds, August 8th, 1871. RICH. REYNOLDS.

Sir,—Having carefully perused the interesting work by Sir Charles Bell 'On the Hand,' commended to me by Mr. Sandford, I am unable, although "we find every organ of sense, with the exception of touch, more perfect in brutes than in man," to entertain "the opinion of Anaxagoras, that the superiority of man is owing to his hand;" therefore I will, with your permission, endeavour to state more succinctly what I did mean in my former note. It is a great misfortune that theorists and men of great scientific attainments are apt to describe the common sense of ordinary men of business as "nonsense;" and as the "good deal of nonsense" that "has been talked" came chiefly from those who had only the practical knowledge of their business to guide them, I am not surprised at any contempt with which their utterances are regarded. I doubt not the majority of your readers understood that the education at the Square required by the Examiners was the check I alluded to, and the only kind needed to qualify a man to carry on his duties. If not, how is it mechanical arrangements, alarm bells, etc., are not included in the studies? It was stated by Mr. Forster that regulations would not be requisite, if all were educated up to the pharmaceutical standard.

Dr. Greenhow, in his report, considered the examinations "as practical as possible," and the President in his report at the last Annual Meeting read:—

"I have, in conclusion, only to repeat what has already been implied in my Report, that, in my opinion, the examinations of the Pharmaceutical Society are of such sort, and are conducted in such manner, as to constitute a sufficient guarantee to the public with regard to the qualifications of persons admitted to register under the Pharmacy Act, 1868."

This is the check which all friends of the Society have been striving to establish; but if the new signification is to be accepted, then a different order of intellect will be required, and probably a new "*Bell* scholarship" will be instituted, by which the sense of *hearing* would act as the sentinel of the brain.

In concluding with the following remarks, I believe I shall not be the first, by some hundreds, who have uttered similar "nonsense." That it is not to be wondered at, if those not of the trade should seek to bind on others mechanical substitutes for intelligence, but that those among ourselves, who are educated, should themselves endeavour to be chained up as dangerous individuals, and should provide their own fetters, seems an attitude at once humiliating and unaccountable.

August 8th, 1871. JOHN WADE.

Sir,—A word or two in reply to your editorial note in reference to the orthography of my letter to Mr. Smith. Writing hurriedly, and under pressure of many duties, I may have carelessly transposed some of my letters or made some mistake; but is it not a needless function for you to exercise to call attention to errors of this kind occurring in correspondence?

A word to Mr. Smith. This gentleman does not meet my charges, but takes refuge in impeaching my orthography. This doubtless indicates Mr. Smith's orthographical eminence, and demonstrates his innate gentlemanly nature and unusual refinement of disposition.

63, *Piccadilly, Manchester,* ROBT. HAMPSON.
August 8th, 1871.

W. F. C.—A formula for composition powder has been given before, vol. i. p. 457.

"*An Apprentice and Subscriber*" has not sent his name and address.

A. B.—Macmillans.

"*Veuve.*"—(1.) No. (2.) No.

Owen Jones.—(1) The practice is not illegal. (2.) The retailing of poisons by an unregistered person would be against the law, and the sale of poisons insufficiently labelled would be an additional offence.

M. P. S.—Those persons who passed the "Separate Examination for Chemists in business" were *not* supplied with diplomas similar to those awarded to successful candidates in the Major Examination.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. G. Brownen, Mr. R. Newall, Mr. J. Thompson, Mr. J. J. Thomas, Mr. A. W. Gerrard, Mr. Macmillan, Mr. R. Chessall, Mr. T. Griffin, Mr. W. R. Rednall, Mr. A. W. Bennett, Mr. W. H. Wilcox, Mr. J. Horsley, Mr. W. Wilkinson, Mr. Fairlie, Mr. Postans, G. R. C., "Minor Exam.," "One of the Candidates," "Galvanic," "An Apprentice."

VESICATING INSECTS.

BY M. C. COOKE, M.A.

(*Continued from page* 102.)

SIDA MYLABRIS, *Mylabris phalerata*, Pall.; villous, black; elytra black, with three broad undulating rufescent bands; the first arising from two spots.—Pall. Ic. p. 78, t. E. f. 3 b. *Mylabris Sidæ*, Fabr. S. El. ii. p. 83; Brandt and Ratzb. ii. t. 18. f. 18; Billb. Mon. t. i. f. 1–5. Head black, punctulate, villous; antennæ black, brow impressed. Thorax longer than broad, black, villous, punctate, transversely impressed, the impression in the middle punctiform, the other at the base broader. Scutellum small, black, punctate; elytra three times as long as broad, punctate, black; with two undulating bands and two rufescent spots at the base, the spot by the scutellum rounded, that at the margin oblong. Wings hyaline, with tawny veins. Breast and abdomen black, villous, punctate. Feet black, villous.

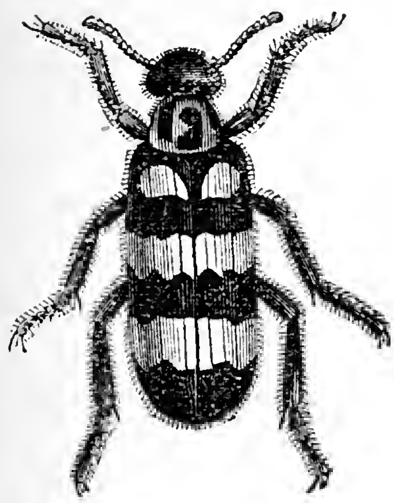

Fig. 2.—*Mylabris phalerata.*

Found on species of *Sida*, *Hibiscus*, etc.

This species is a native of the Cape of Good Hope, China, etc., and forms a portion of the commercial article exported from China. According to Soubeiran, it is largely employed in Germany, where it is imported by English merchants. The bands are reddish-brown, and *not* ochraceous-yellow, as in the chicory *Mylabris*. It is figured by Pallas, as cited above, and in Billberg's 'Monograph,' t. 1. f. 1–5. The greater portion of the "Chinese Fly" imported into this country has consisted of the present species, which is generally much larger than *M. cichorei*. It seems probable that the remarks of Indian observers, in so far as they refer to the Telini fly feeding on *Sida* and *Hibiscus*, belong to this species.

FOUR-SPOTTED MYLABRIS, *Mylabris melanura*, Pall.; villous, black; elytra reddish-brown, or yellowish, with four spots, black at the apex, the inner margin of apical band sinuated.—Pall. Ic. p. 86. *M. quadripunctata*, Tausch. Mem. Mosc. p. 133. t. x. 2; Billb. Mon. t. iii. f. 7–12. *M. cichorii*, Oliv. c. iii. p. 7. t. ii. f. 13. Head black, villous, punctate. Thorax scarcely longer than broad, black, villous, punctate. Scutellum black, villous. Elytra three times as long as broad, punctate, with rudimentary elevated lines; subvillous, yellowish or reddish brown, with four spots; two anterior, one at the suture, the other at the margin, and two posterior, behind the middle, one at the suture rounded, the other at the margin subquadrate; the apical band black with the anterior margin sinuate. Almost the size of *M. variabilis*.

It is a native of Spain and Russia. According to the Pharmacopœia of India it extends also to that country, being cited as one of the indigenous species. It is figured in Billberg's 'Monograph,' t. iii. f. 7, 8, as well as in the 'Moscow Memoirs,' and by Olivier as cited above.

This species can be easily distinguished from the foregoing by the four spots on the elytra. It is smaller than the *Sida Mylabris*, or the majority of the chicory *Mylabris*, and would seem to be less common than either, since it is rare to find a specimen mixed with the commercial 'Chinese Fly."

BANDED MYLABRIS, *Mylabris balteata*, Pall.; villous, black; elytra black, with two broad bands, the outer tawny, the inner yellow with a black spot.—Pall. Ic. 1781, t. H. f. E. 14. *M. punctum*, Fabr. S. El. ii. p. 84; Billb. Mon. t. ii. f. 15–18. *M. Indica*, Fuessly, Arch. t. xxx. f. 6; Oliv. iii. pl. 2, 19. *M. fasciata*, Voet, Cat. Col. p. 20, t. 48, f. 2. *a*. Head black, villous, punctate; thorax a little longer than broad, black, villous, punctate. Scutellum black, punctate. Elytra three times as long as broad, punctate; puncta small, in four longitudinal elevated lines, glabrous, black; with two broad bands one yellowish, with a black point in the middle, the other and posterior band tawny; wings hyaline. Breast and abdomen black, subvillose, punctate. Feet black, subvillous.

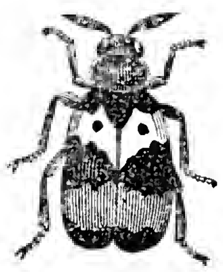

Fig. 3.—*Mylabris balteata.*

Native of the East Indies. According to Dr. Collas ('Moniteur Officiel,' Pondicherry, March 2, 1855), it is one of the species which have been successfully employed in Pondicherry, and as such is quoted by Moquin-Tandon.

This is easily recognized by the different colour of the two transverse bands on the elytra, that nearest the apex being of a darker colour; and also by the little black spot on the lightest band on each elytron.

WAVED MYLABRIS, *Mylabris pustulata*, Thunb.; villous, black; elytra black, with two spots and two narrow bands, of a dark blood-red, deeply dentate. —Thunb. N. I. sp. vi. p. 113, T. f. 13; Oliv. iii. t. i. f. 10 b.; Billb. Mon. t. 1. f. 6. *M. undulata*, Herbst, Fuess. p. 179, t. 48, f. 3. Head black, punctate, villous; front impressed; antennæ black. Thorax half as long as broad, punctate, villous, black. Scutellum black, punctate. Elytra three times as long as broad, punctate; puncta in deep bands, subvillose, black; with two spots, one at the suture rounded, the other at the margin oblong; and two narrow dark blood-red bands, the anterior band undulated, the posterior deeply dentate. Wings hyaline. Breast and abdomen black, punctate, villous. Feet black, villous. Almost the size of *M. phalerata*.

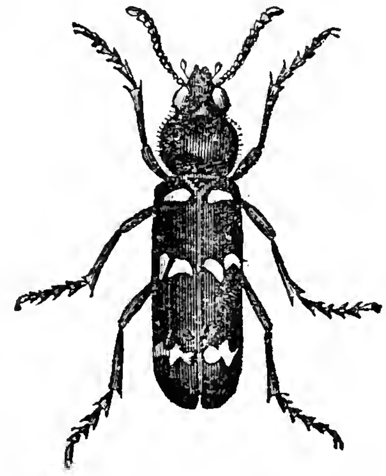

Fig. 4.—*Mylabris pustulata.*

Native of the Cape of Good Hope, China and Bengal. According to Dr. Collas, this is one of the species which has been employed successfully in Pondicherry, upon whose authority it seems to have been quoted in the Pharmacopœia of India.

This is not so easily distinguished from the *Sida Mylabris* by a non-professional eye as the other Asiatic species. The bands are much narrower, and of a deeper-blood-red, and it is fully its equal in size.

EYELET MYLABRIS, *Mylabris oculata*, Oliv.; subvillous, black; elytra black, shining; with an ochraceous spot at the base and two bands, the hindmost rounded at the apex.—Oliv. Ent. iii. p. 47. t. 2. f. 11 *a b*; Billb. Mon. t. v. f. 6–10. *Meloe oculatus*, Thunb. N. Ins. Sp. vi. p. 114. *M. plagiata*, Pall. Icon. t. E. f. 3 *a*. Head black, somewhat hairy, punctate; antennæ black, the six ultimate articulations tawny. Thorax scarcely longer than broad, black, rather hairy. Scutellum black, punctate. Elytra three times as long as broad, roughly punctate with four elevated longitudinal lines, shining, black. Spots at the base rounded, ochraceous, and two bands of the same colour, the one before the middle somewhat arched, and the hindmost, below the middle, the space between chestnut. Breast and abdomen black, somewhat hairy, punctate. Feet black.

Native of the Cape of Good Hope and Bengal. In the variety found in Bengal the basal spot forms a short band. The size is equal to that of *M. phalerata*, from which it is not always easy to distinguish some of its forms. Although this is not recorded in the Indian Pharmacopœia, it is doubtless mixed indiscriminately with other species.

Channelled Mylabris, *Mylabris humeralis*, Walk.; black, elytra with two humeral furrows, two basal yellow spots, and two angular bands; length 9 to 11 lines.—Walker, Ann. Nat. Hist. Ser. iii. vol. ii. p. 285.

The typical insect described by Walker is in the British Museum Collection, and was from Ceylon. This is, however, one of the indigenous species cited in the Pharmacopœia of India.

Oriental Mylabris, *Mylabris orientalis*, Mars.

We cannot find that this species has been described; it is included in Gemminger and Herold's catalogue, and appears to have been one of the species recognized by Marseul in his 'Monograph,' submitted to the Entomological Society of France in 1870, with the citations of Dejean's Catalogue III. ed. p. 244. The locality quoted is the East Indies, and it is enumerated in the Pharmacopœia of India as one of the indigenous vesicants. Beyond this we can furnish no information or description, and must rest content with waiting until the promised publication of Marseul's 'Monograph.'

Mylabris proxima?

One of the species cited as indigenous in the Pharmacopœia of India; but, beyond this, we find no mention of the name, or any description answering thereto.

This completes the list of species belonging to the genus *Mylabris*, of which we have any certain knowledge that they are employed as vesicants in Asia. When the *Coleoptera* of China and India are better known, it may be presumed that there, as in the Archipelago, other equally good vesicants will be discovered.

PRESERVATION OF TINCT. KINO FROM GELATINIZING.

BY J. W. WOOD.

Among all our tinctures, perhaps there is not one so liable to deteriorate by exposure, or by long keeping, as tincture of kino, made in accordance with the U. S. Pharmacopœia; its well-known property of gelatinizing in a short time—a property which yet remains to be investigated—being thereby rendered inert, precludes it from being as extensively used as its virtues would seem to warrant.

This property renders it inadmissible when we desire a reliable tincture, to prepare it in large quantities.

The Pharmacopœia formerly directed it to be prepared with dilute alcohol as the menstruum; but later it was thought to be of advantage to increase the proportion of alcohol to two-thirds; yet it is doubtful if there was much gained by this change.

I would therefore submit the following mode of preparation, which I consider, from the experience I have had, will meet with the desired end, and up to the present time results do not seem to disprove it. It is as follows:—

℞ Kino in fine powder, ℥iss
Alcohol ·835, f℥viij
Water f℥iv
Glycerine, f℥iv.

Mix the alcohol, water and glycerine together, and having mixed the kino with an equal bulk of clean sand, introduce in a percolator and pour on the menstruum.

This menstruum seems to thoroughly exhaust the drug of its astringent principle, and also makes a nice-looking preparation.

Some which I made on the 16th day of July, 1870, was exposed to the influence of the atmosphere, the stopper of the bottle containing it having been removed for several months, so that it had evaporated to at least two-thirds; yet it remains as good as when freshly made, without any apparent tendency to gelatinize.

The menstruum might be somewhat modified, perhaps with advantage, as, for instance, by using proportionally less alcohol and more glycerine and water, or *vice versâ*. At any rate I will give it for what it is worth; adding at the same time the suggestion—and it is only a suggestion—that the same menstruum be employed in preparing tinct. catechu, which, though not so liable to gelatinize as tinct. kino, yet sometimes does so.—*Amer. Journ. Pharmacy.*

PHARMACY IN THE REPUBLIC OF CHILI.

Dr. J. N. Ullersperger, of Munich, furnishes some interesting information on the state of pharmacy in Chili, from which we learn that the war of 1866 against Spain had a most unfavourable influence upon it. The President of the Sociedad de Farmacía—which, it seems, represents science in all its branches—reported to the Minister that the Society had endeavoured to keep up its connection at home and abroad, and also to commence several investigations; but the latter progressed but slowly, as the subsidies voted by the national congress were applied to war purposes, in consequence of which the publication of the journal had also to be suspended. Nevertheless, the society managed to keep open their laboratory, to discuss and to ripen a plan for raising the pharmaceutical studies to the level of the demands of modern science, and finally to take preliminary steps for the compilation of a Pharmacopœia. The Society had also continued to take meteorological observations in different parts of the republic; they had received several memoirs, collected information on several plants of the country, and otherwise shown active signs of their existence;

they looked well after the army dispensaries, and collected much statistical information hitherto greatly neglected.

At the end of the war, in 1867, matters had somewhat resumed their former regularity, and especially the different branches of the university seem to have done their best to advance scientific life and interest. In the botanical department, Don R. A. Philippi published a fresh report on Father Feuillée's valuable work, 'Las Plantas Chilenas,' a record of travels in Chili and Peru in the years 1709 to 1712. Don T. Domeyko, professor of mineralogy, sent in analyses of several Chilian minerals; while in zoology Don R. A. Philippi supplied a critical commentary.

At a meeting of the Council of the University in March, 1867, it was decided to adopt as textbook for public instruction Don Anjel Vasquez' treatise entitled 'Tratado de Química Orgánica, con aplicacion á la Farmacía y Medicina;' clearness in the exposition of matters, complete study of organic chemistry, enlargement of the parts treating of animal chemistry, were given as special recommendations. But, unfortunately, the necessary funds for printing the book, which the university had to find, were not forthcoming, and the publication had to be postponed.

In October, 1867, the Dean of the Medical Faculty, Don Ceslao Diaz, submitted a plan for regulating the pharmaceutical education, entitled, 'De Estudios para los Aspirantes á la Profesion de Farmacía;' and a month later the Dean, Don I. I. Aguirre, proposed certain regulations by which the exercise of pharmacy and the sale of medicines and drugs are properly limited, and by which the pharmacist has seemingly acquired a proper legal status. This—'Reglamento para el Ejercicio de la Profesion de Farmacía, venta de Medicinas y Drogas'—treats of the medicines and of those who are entitled to sell them; of the exercise of pharmacy; of the Pharmacopœia and the lists of officinal substances; of the visitation of pharmacies; of the sale of drugs; and of the fines in case of contraventions. The list of natural and chemical products exclusively medicinal, and which drysalters or druggists are allowed to sell only wholesale, and without previous preparation, comprises 238 substances; poisons which non-pharmacists are not allowed to sell without special precautions, such as registering the names of buyers, intended use of poisons, etc., are 88 in number; and the list of medicinal non-poisonous plants, the sale of which is free, contains 86.

Besides these regulations, there are a number of restrictions, issued by the medical police, to which the pharmacist is bound to submit. The conditions of the study of pharmacy for apprentices or assistants are twofold; they refer to the number of years required for a pharmaceutical course, and to the different branches of study. Ten years are prescribed, the first five for school training, and the following five for special studies, viz. 1st year, inorganic chemistry and botany; 2nd, organic chemistry, analyses of drugs and medicines, zoology; 3rd year, analyses as before, materia pharmaceutica; 4th year, practical pharmacy, comprising chemical pharmacy, dispensing of medicines, officinal substances, and study of formulas and prescriptions; 5th year, legal pharmacy, including theoretical and practical toxicology, study of the Pharmacopœia, and again investigations of drugs and medicines.

In 1868 there were eighteen students, "aspirantes á la profesion de farmacéutico," at the University of Santiago.

THE GASEOUS AND LIQUID STATES OF MATTER.

BY THOMAS ANDREWS, M.D., F.R.S.,

Vice-President of Queen's College, Belfast.

The liquid state of matter forms a link between the solid and gaseous states. This link is, however, often suppressed, and the solid passes directly into the gaseous or vaporous form. In the intense cold of an Arctic winter hard ice will gradually change into transparent vapour without previously assuming the form of water. Carbonic acid snow passes rapidly into gas when exposed to the air, and can with difficulty be liquefied in open tubes. Its boiling-point, as Faraday has shown, presents the apparent anomaly of being lower in the thermometric scale than its melting-point; a statement less paradoxical than it may at first appear, if we remember that water can exist as vapour at temperatures far lower than those at which it can exist as liquid. Whether the transition be directly from solid to gaseous, or from solid to liquid, and from liquid to gaseous, a marked change of physical properties occurs at each step or break, and heat is absorbed, as was proved long ago by Black, without producing elevation of temperature. Many solids and liquids will for this reason maintain a low temperature, even when surrounded by a white-hot atmosphere, and the remarkable experiment of solidifying water, and even mercury, on a red-hot plate, finds thus an easy explanation. The term spheroidal state, when applied to water floating on a cushion of vapour over a red-hot plate, is, however, apt to mislead. The water is not here in any peculiar state. It is simply water evaporating rapidly at a few degrees below its boiling-point, and all its properties, even those of capillarity, are the properties of ordinary water at 96·5 C. The interesting phenomena exhibited under these conditions are due to other causes, and not to any new or peculiar state of the liquid itself. The fine researches of Dalton upon vapours, and the memorable discovery by Faraday of the liquefaction of gases by pressure alone, finished the work which Black had begun. Our knowledge of the conditions under which matter passes abruptly from the gaseous to the liquid, and from the liquid to the solid state, may now be regarded as almost complete.

In 1822 Cagniard de la Tour made some remarkable experiments, which still bear his name, and may be regarded as the starting-point of the investigations which form the chief subject of this address. Cagniard de la Tour's first experiments were made in a small Papin's digester, constructed from the thick end of a gun-barrel, into which he introduced a little alcohol and also a small quartz ball, and firmly closed the whole. On heating the gun-barrel, with its contents, over an open fire, and observing from time to time the sound produced by the ball when the apparatus was shaken, he inferred that after a certain temperature was attained the liquid had disappeared. He afterwards succeeded in repeating the experiment in glass tubes, and obtained the following results:—An hermetically-sealed glass tube, containing sufficient alcohol to occupy two-fifths of its capacity, was gradually heated, when the liquid was seen to dilate, and its mobility at the same time to become gradually greater. After attaining to nearly twice its original volume, the liquid completely disappeared, and was converted into a vapour so transparent that the tube appeared to be quite empty. On allowing the tube to cool, a very thick cloud was formed, after which the liquid reappeared in its former state.

It is singular that in this otherwise accurate description, Cagniard de la Tour should have overlooked the most remarkable appearance of all, the moving or flickering striæ which fill the tube when, after heating it considerably, the temperature is quickly lowered. This phenomenon was first described by myself in 1863, as it is seen in carbonic acid which has been partially liquefied by pressure, and afterwards heated a little above 31°. It may be observed on a larger scale and to great advantage by heating such liquids as sulphurous acid or ether in hermetically-sealed tubes.

The experiments whose results I am about to describe have occupied me for a period of fully ten years; they involved the construction of novel forms of apparatus, in which the properties of matter might be studied under varied conditions of temperature and pressure, such as had never been realized before. In my earlier attempts I endeavoured, as others had already done, to use the expansive force of the mixed gases which are disengaged in the electrolysis of water; and I was able in this way to obtain pressures of 150 atmospheres and even more in glass tubes; but the method was in many respects defective, and more than one dangerous explosion occurred, so that I eventually abandoned it.

In the apparatus finally adopted, the gas to be compressed is enclosed in a long glass tube, of which the greater part of the length, or about 450 millimetres, has a capillary bore, and the remainder, about 150 millimetres, an internal diameter of 2 millimetres. The free capillary end is sealed, while the gas in a pure and dry state is passing through; while at the other end the gas is confined by a movable column of mercury. The details of the method by which this is accomplished will be found in the Bakerian lecture for 1869, to which I must also refer for an account of the process by which the original volume of the gas at the freezing-point of water and under one atmosphere of pressure was determined, and also the volumes of the same gas deduced from the observed measurements when it was compressed at different pressures in the capillary tube.

A conical protuberance on the capillary part of the tube, a little above its junction with the wider part, corresponded as nearly as possible with a hollow cone in a stout brass flange, the joint being rendered perfectly tight by careful packing. The body of the apparatus consisted of two cold-drawn copper tubes of great strength, to the ends of which four massive brass flanges were firmly attached. Two corresponding flanges or end pieces, each carrying a fine steel screw packed with great care, were bolted on the lower flanges. The success of the experiments depended greatly on the packing of this screw. It was effected by means of a number of leather washers, tightly pressed down and saturated *in vacuo* with melted lard. The apparatus was now filled with water; the flanges with the glass tubes, one containing the gas to be examined, the other air or hydrogen to act as a manometer or measure of the pressure, were bolted down upon the upper flanges of the copper tubes. The joints had always leather washers interposed; and when sufficiently tightened, they resisted any pressure which could be applied, even for an indefinite time. The two copper tubes were connected by a fine horizontal tube, so that the whole of the interior of the apparatus was in free communication. The pressure was obtained by screwing one or other of the steel screws into the water. I have recently had the apparatus constructed of iron and filled with mercury. As mercury is much less compressible than water, the same length of screw produces a greater pressure on the interior of the apparatus, even with a larger cavity. There are other advantages in this form of the apparatus which I hope will facilitate future research. The objection to it is its extreme sensitiveness to changes of temperature, so that a variation of $\frac{1}{100}$th of a degree alters the internal pressure by several atmospheres.

In the actual experiments the gas under examination does not come into view till it has entered the capillary tube, and is exposed to a pressure of thirty or forty atmospheres. The limit of the pressure which can be obtained has hitherto been the capacity of resistance of the glass tubes to bursting. Fine thermometer glass tubes of white glass will frequently burst when exposed to a pressure of little more than 100 atmospheres; but green glass tubes of good quality are much stronger, and will easily bear a pressure of 300 atmospheres. One of the strongest forms of glass capillary tube for resisting internal pressure is obtained by drawing out a thick, green glass tube, heated to softening, till it becomes so fine as to be flexible. Tubes of this kind can easily be drawn out at the blowpipe table, and obtained of very uniform bore. I have compressed air in such tubes to $\frac{1}{400}$th of its ordinary volume without bursting the tubes.

Two rectangular brass cases, closed before and behind with plate-glass, surround, one the manometer, and the other the tube containing the gas to be examined, and allow them to be maintained at any required temperature by the flow of a stream of water. The manometer was maintained as nearly as possible at the temperature of the apartment; the tube containing the gas, on the contrary, was maintained at different temperatures, according to the object in view. The following observations, published in 1863, contain the results of my earliest experiments on this subject:—"On partially liquefying carbonic acid by pressure alone, and gradually raising the temperature at the same time to 88° Fahr., the surface of demarcation between the liquid and gas becomes fainter, loses its curvature, and at last disappears. The space is then occupied by a homogeneous fluid, which exhibits when the pressure is suddenly diminished or the temperature slightly lowered, a peculiar appearance of moving or flickering striæ throughout its entire mass. At temperatures above 88° no apparent liquefaction, or separation into two distinct forms of matter, could be effected, even when a pressure of 300 or 400 atmospheres was applied. Nitrous oxide gave analogous results."

The flickering striæ referred to can be admirably shown, as I mentioned before, in hermetically-sealed tubes of strong glass, partially filled with such liquids as sulphurous acid or ether. The liquid must in the first instance be heated a few degrees above what I have designated the "critical" point. The appearances exhibited by the ascending and descending sheets of matter of unequal density are most remarkable, but must be seen in order to be understood. They only occur in this striking form in fluids heated a little above the critical point, and are produced by the great changes of density which slight variations of pressure or temperature produce in this case. They are always a clear proof that the matter in the tube is homogeneous, and that we have not liquid and gas in presence of one another. These striæ are in short only an extraordinary development of the movements seen in ordinary liquids and gases when they are heated from below. The experiments to be immediately described will explain their great intensity above the critical point.

When the temperature falls below the critical point, the formation of a cloud indicates that we have now heterogeneous matter in the tube, fine drops of liquid in presence of a gas. We must take care, however, not to suppose that a cloud *necessarily* precedes the formation of true liquid. If the pressure be sufficiently great, no cloud of any kind will form.

I now proceed to describe the general results of the experiments upon carbonic acid. If a certain volume of carbonic acid at the temperature of 13°·1 and under a pressure of one atmosphere be exposed to a gradually-increasing pressure, its volume will steadily diminish, but at a faster rate than according to Boyle's law, till at the pressure of 48°·9 atmospheres its volume is reduced to about $\frac{1}{81}$st of the original volume at one atmosphere. Liquefaction now begins and continues with very slight augmentation of pressure, the necessity for which I traced to the presence of a minute quantity of air (about $\frac{1}{500}$th part) in the carbonic acid. On augmenting the pressure after liquefaction, the volume slowly diminished, but at a much faster rate than in the case of ordinary liquids. Later experiments carried to much higher pressures have fully confirmed this result. At 21°·5 similar results were obtained, but a pressure of nearly 60 atmospheres was required before liquefaction began.

At 30°·9 C., or 87°·7 Fahr., the critical point of temperature is reached. It is the temperature at which liquid ceases to be formed under any pressure. At a temperature a little below this point the surface of separation between liquid and gas becomes very faint and loses its curvature, the density and other physical properties of the liquid and gas being now identical and the tube filled with homogeneous matter. If the temperature and pressure be kept steady, no evidence of heterogeneity will be obtained by optical tests under the most varied conditions of volume.

If we now follow the course of a given volume of carbonic acid gas at 31°·1, or 0°·2 above the critical point, we shall find that its course resembles that of the gas at lower temperatures till the volume is reached at which liquefaction might be expected to begin. A rapid but not (as in the case of the formation of liquid) abrupt fall then supervenes, after which the carbonic acid undergoes a slow diminution of volume as the pressure augments. The curves, which are here exhibited as they were represented in the Bakerian lecture, illustrate very clearly these statements. We have thus carbonic acid at 0°·2 above the critical point, and at a pressure of 73 atmospheres behaving very nearly as if it liquefied. At this pressure an augmentation of only $\frac{1}{37}$th of the entire pressure diminishes the volume of the carbonic acid to about one-half. Yet during the whole of this fall, no evidence of heterogeneity, or of two states of matter present together in the tube, could at any period be obtained. Carbonic acid at this temperature of 31°·1, and under a pressure of 75 atmospheres, behaves much more as a liquid than as a gas when the pressure is either augmented or diminished; yet it never exhibits under any conditions the characteristic properties of the liquid state; that is to say, no surface of separation is formed by change of pressure, nor will it collect into drops and form a cloud.

(To be continued.)

SOME MEDICINAL PLANTS OF CANADIAN GROWTH.

BY W. SAUNDERS, LONDON, ONTARIO.

Having become somewhat debilitated by close application to business, I purchased two years since a farm with the intention of planting it with fruits of various sorts, and growing as well such varieties of foreign and indigenous medicinal plants as should be found suitable to the soil and climate. The personal supervision requisite to begin and carry out successfully an undertaking of this sort would, I knew, oblige me to be away much from the shop, and exchange its closer atmosphere and sedentary occupations for the more active employments and purer air of the country. I believe, as a class, we pharmaceutists are fond of our profession, and there are charms as well as ties about it which seem to draw one naturally into long hours of steady application. It requires a considerable effort to break away from these influences, and unless one is obliged to do so, good resolutions are often set aside to suit occasion and convenience. My undertaking may not, at present, be regarded as a paying one; but there will surely be a large sum to place to the credit side on account of improved health and increasing vigour,—more than sufficient, I think, to balance any losses which may arise; and in this way at least I can recommend it to my fellow-pharmacists as a profitable enterprise.

This being the second season only for the new business, it is impossible to present any very full or complete details as to the success and profits attending the growth of the various medicinal articles, for, besides the time being too short, the seasons have both been very unfavourable. We have had such excessive rains that the ground has been almost saturated with water during a great part of the growing period; still I hope that the few results I am able to communicate will not prove uninteresting.

The first and one of the greatest difficulties was the procuring of suitable seeds, fresh and good; there is so little demand for such that they are sometimes old and almost worthless before they come into the purchaser's hands, so that very few of them will germinate. Some of the needed articles were found among the seed dealers of New York and Boston, others were obtained from the establishment of Vilmorin, Paris, France.

ATROPA BELLADONNA.

Two ounces of seed was planted, late in May, in drills of $2\frac{1}{2}$ feet apart, and covering 1-16th of an acre of ground, with the intention of transplanting it into rows, at suitable distances, the following season. The plants came up moderately thick, and attained a fair growth before the close of the summer; in one or two instances flowers appeared on them late in September. The outer leaves were partially stripped before severe frost came, carefully leaving the crowns uninjured. The product yielded 11 lb., when dry. Thinking that the plants were sufficiently vigorous and well established to withstand the cold of winter, they were not in any way protected. The season proved too severe for them, the following spring showing every plant dead, with its roots quite rotten.

From the herb gathered in the fall some preparations were made—fluid extract and solid extracts, watery and alcoholic. On comparison with similar preparations from like quantities, and made with equal care from a fair sample of the imported herb, the following results were noted:—

1 lb. of herb of Canadian growth yielded of solid aqueous extract, 2 oz. 7 drs. 23 grs.	1 lb. of imported herb yielded of solid aqueous extract, 3 oz. 5 drs. 10 grs.
Solid alcoholic extract, 1 oz. 5 drs. 25 grs.	Solid alcoholic extract, 2 oz. 2 drs. 30 grs.

Showing a difference of yield in favour of the imported herb of 5 drachms 47 grains aqueous extract, and 5 drachms and 5 grains alcoholic extract.

The fluid extract made from the herb of Canadian growth has the narcotic odour of the plant in a higher degree than that from the imported herb; the odour is so strong in the former case that it approaches pungency. It has been used in a few cases in practice, and as far as I have been able to ascertain, has acted fully as well as that made from the foreign plant.

The solid aqueous extracts closely resemble each other in odour, although I am inclined to regard that from the Canadian plant as strongest.

The alcoholic extracts differ in odour very materially; that from the herb of Canadian growth is much heavier and more powerful than the other. I have had no opportunity of having these latter articles tested in medical practice.

HYOSCYAMUS NIGER.

One ounce of seed in this instance was planted at the same time and in the same manner as that of the belladonna, occupying a space of less than 1-20th of an acre. The plants came up thin, a large proportion of the seeds failing to germinate. Ten pounds of leaves were gathered about the 1st of October. Some of the plants belonged to the annual variety, others to the biennial; most of the latter, in this instance, stood the winter well and sprouted out vigorously on the opening of spring, but the land where they were established being required for other purposes, they were transplanted. The place selected for their removal was rather low, and the wet season proved very unfavourable for their establishment; hence during the summer the larger part of the plants died; the few survivors were left for seed.

This plant has become naturalized, and is now growing wild in many parts of Canada, so that there is little doubt but that its culture, if desirable, might be made successful. A series of preparations have been made, in this case, similar to those made from belladonna, with results as follows:—

1 lb. of herb of Canadian growth yielded of solid aqueous extract, 2 oz. 6 drs. 4 grs.	1 lb. of imported herb yielded of solid aqueous extract, 3 oz. 4 drs. 44 grs.
Solid alcoholic extract, 1 oz. 3 drs.	Solid alcoholic extract, 2 oz. 2 drs. 50 grs.

Showing a difference of yield also in favour of the imported herb of 6 drachms 40 grains aqueous extract, and 7 drachms 50 grains alcoholic extract.

The odour of the fluid extracts seems exactly alike; that from the aqueous extracts is also similar, although the advantage seems to rest with the Canadian article; while the alcoholic extracts again differ materially, the foreign article having the weaker odour.

The culture of *Digitalis purpurea* has not been attended with much success. A good quantity (2 oz.) of seed has been sown; but either the seed has been worthless, or it has been sown too deep, so that very few plants have appeared. Some of those grown last year survived the winter without protection, but many of them died. Seed sown this year has also come up very sparingly.

Dill was tried last season without success; the plants grew well and flowered, but the season proved too short for the seed to mature. Besides, it was almost destroyed by the attacks of a small caterpillar, which affects nearly all the umbelliferous plants with us. It is the progeny of a pretty little moth called *Depressaria Ontariella*. This little creature feeds on the unopened flowers, drawing the various portions of the umbel together with threads of silk, soon disfiguring and destroying them. Had the seed ripened, three-fourths of the crop would probably have been lost from this cause.

Fenugreek was also tried. It came up very thick, and did well; its peculiar odour perfumed the air for some distance around the patch during the latter part of the season, but the seeds, which formed well in their long pods, did not ripen sufficiently to be of any value. Better success attended the growth of coriander and caraway. One-eighth of an acre of coriander, with half a pound of seed, yielded 110 lb.; and one-fifteenth of an acre of caraway, with half a pound of seed, 106 lb., the corianders maturing their seed the same season that they were planted; the caraways not maturing till the second year.

Many other of the common herbs have been successfully grown, including wormwood, sage, hyssop, thyme, rue, horehound, rosemary, summer savory, poke-root and elecampane. Seeds of leptandra and glycyrrhiza germinated well, but the growth of both has been weak.

A quarter of a pound of dandelion seed has been sown this season on about three-fourths of an acre of ground. The plants have made very good growth, the roots having already attained about half an inch or more in diameter, and will probably acquire size sufficient to give a profitable yield before the close of the season.

The following includes most of the complete failures, that is, when the seed did not germinate at all:—*Arnica montana, Veratrum album, Gentiana lutea, Aconitum Napellus, Angelica, Solanum Dulcamara, Colchicum autumnale, Bryonia alba* and *Polygala Senega*.—*Proceedings of the American Pharmaceutical Association.*

PAROCHIAL CHEMISTRY.

That chloride of calcium and many other salts absorb water from the air, and that aqueous solutions of such salts will not dry up at the ordinary temperature of the atmosphere, even in summer, are facts so certain and so familiar as to have wellnigh acquired, in the estimation of chemists, the rank of necessary truth.

We learn that a civil engineer, in the employ of one of the London vestries, has made the discovery that a solution of deliquescent chlorides dries up as fast and as completely as pure water when exposed to the action of the summer sun. The locality in which so important an observation was made is the parish of St. George's, the occasion being the laying down of Mr. Cooper's deliquescent salts in the streets of that parish. We understand that the labourers employed under the distinguished engineer in question have made the still more remarkable observation that these deliquescent salts accelerate the evaporation of water. It appears that that which passes current among chemists relative to the properties of deliquescent salts is regarded by the eminent engineer in question as purely theoretical, as distinguished from his own observations and those of his men, who observe practical facts.—*The Lancet.*

Druggists' Shops in Djidda.—Djidda is the seaport of Mecca, and is little more than a day's journey from that famous city. Its trade, for an Eastern town, is considerable, and frequently forty or fifty ships may be counted lying together in its harbour. Some of the best shops in Djidda are those belonging to druggists, who do a lucrative trade. They are chiefly from India or of Indian descent. Besides dealing in all sorts of drugs, they sell candles, sugar, perfumery and incense, which is much used by the wealthy inhabitants, who perfume their best rooms every morning. For this purpose mastic and sandal-wood burnt upon charcoal are in great request. Coffee is rarely drunk in private houses without an admixture of cardamoms or cloves, and spices of all sorts and red pepper form an essential ingredient of most dishes. Another article of trade is rosebuds, which are brought from the Gardens of Tayf. The people of the Hedjaz, especially the ladies, not only steep them in the water used for their ablutions, but boil them with sugar and make a preserve of them.—*Food Journal.*

Sulphur in the Province of Caltanicetta, Sicily.—The following extract is taken from a report sent by M. Thibaudier, of the French consulate at Palermo, to the Minister of Foreign Affairs, 20th January, 1870. In the province there are altogether about 134 mines at work, which employ 11,000 workmen, and produce 105,350 tons of sulphur. This is almost entirely transported to the coast by means of mules, and is shipped from the ports of Girgenti, Catane, Terranova and Licata. The price varies from twenty-two to fifty francs per ton. The principal mines of the province, either from the development which they have already obtained, or from the importance that they are likely to acquire in a short time, are in the mining district of Caltanicetta, viz. Trabonello Gebbria rossa, and Giordano (stretto); the Capo d'Arso and Floristella, in the Castro Giovani district; Gallitano, in the district of Mazzarino; Grottacalda, in that of Piazza; Sociale, in the Montedoro district; Solfare Grande, in the Sommatino district; and in the Riesi district, the mines of Solfara del fiume, Apaforte, and Stincone. Some of these mines already have a production of from five to eight thousand tons annually, as Trabonello, Capo d'Arso, Solfare Grande, Grottacalda, and Solfara del fiume. All the mines are capable of great development.—*Journ. Society of Arts.*

The Pharmaceutical Journal.

SATURDAY, AUGUST 19, 1871.

Communications for this Journal, and books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

HOSPITAL DISPENSING.

IN the Journal of the 20th August last year we took occasion to comment on this subject, making use of a casualty that had occurred at the Royal Free Hospital as our text. And we now recur to it for the purpose of reminding those interested, that the duties of a hospital dispenser are entirely different from those of a chemist pure and simple, both in the kind of work, and in the way that that work is, or ought to be, accomplished. Great and constant care is required in both these walks of life, but we take it that hospital dispensers, whether in 'Service' or civil institutions, appreciate too little the importance of sticking to orders, and of giving out nothing that is not strictly prescribed in 'black and white.' The dispensary of a large hospital is a field in which work must be done quickly as well as accurately, and there are a thousand and one temptations to the loose performance of duty. Hospital out-patients, particularly in the country, are by no means clever in receiving or understanding verbal directions, so that little or nothing on this head should be left to common sense. For, though a struggling and by no means civilized crowd of sick people, all fighting their way to the dispensary window, by no means conduce to a placid frame of mind, dispensers are not on that account exempt from the results of carelessness. And often, in the midst of the work of the out-patient department, sisters and nurses make continual verbal appeals for this or that draught, mixture, or extra, accompanied by the assurance that the written order shall be soon produced. Some nurses are careful and perfectly trustworthy, but according to our knowledge, belief, and experience, no hospital dispenser should give out a medicine or drug of any sort or kind without an authority *in writing*, from the responsible officers. We firmly believe that a strict adherence to this rule would save trouble and prevent serious misadventures; and we are sure that this is the very decided opinion of those who have had much experience in the administration of large public institutions. It is, of course, impossible to legislate with success for the wonderful eccentricities of stupidity; and we doubt very much whether yellow labels, triangular, or "knobbed" vials or all the ingenious machinery for the prevention of therapeutical casualties that have lately been introduced into practical pharmacy, avail much, where common sense and ordinary prudence are absent. A good hospital dispenser may do much useful service to the hospital with which he is connected, by keeping a wholesome check on the expenditure, and advising the administration as to how and where savings can be effected in the purchase of drugs. Medical men are seldom good financiers, and cannot be supposed to know much about the market value of the medicines that they prescribe. But these matters come fairly within the range of a dispenser's duties, and an officer who can recommend when and how to buy to advantage may be the means of economizing hospital funds in his own department to a very considerable extent. It may, perhaps, be thought that the above remarks refer only to a small section of our readers, but they are worthy the attention of all who are now, or who are likely to become, public officers, in that which is a very important branch of all hospital establishments.

CONDURANGO, THE NEW REMEDY FOR CANCER.

THE new reputed cure for cancer, condurango or cundurango bark, a report of an analysis of which was recently published in this Journal (p. 63), appears to be creating considerable interest in the United States. The *New York Tribune* says that the surprising results following its use in cases of cancer have caused a great demand for it, as many as twenty or thirty letters a day being received by Dr. BLISS, to whom a small quantity had been sent by the Ecuadorian minister, and as many more by the State department, asking for supplies of it. Amongst the cases quoted where benefit has followed from its use is that of the mother of Vice-President COLFAX, who it is stated, with less than five ounces of the condurango, has been nearly cured of a cancer, which it was expected would end her life within the year. Dr. BLISS, being convinced that condurango is a specific for cancer, sent an order for five hundred pounds to a business house in Guayaquil, but was informed that it was not an article of commerce, and not obtainable by the ordinary commercial methods. He has therefore dispatched his partner, Dr. KEENE, to Ecuador to obtain a supply; and in order to facilitate his mission, that gentleman was made the bearer of official dispatches to the Government of Ecuador, and furnished with letters of recommendation by President GRANT, Mr. COLFAX, Mr. FISH and other prominent persons.

Dr. KEENE writes that the task of obtaining the condurango is more difficult than was expected. The roads to the Loja district are rough and unfrequented, the rainy season is not yet over, the streams are swollen, and dangerous to cross, and the Indians are disposed to throw every obstacle in the way of foreigners, of whom they are deeply jealous. However, when he wrote he was on the point of starting for the interior, and was confident of procuring a supply, in season for it to reach early in August. On arriving in the Loja district he will hire a force of Indians to gather the plant, and bring it down from the mountains, where it grows at points so high as to be inaccessible to beasts of burden. It will then be packed on mules, and transported to the coast. Dr. Keene found that orders for condurango had been received at Guayaquil from persons in England, France, Italy and other countries, to the Governments of which the Government of Ecuador had furnished samples.

On the other hand, there are evidently those who have doubts concerning the reputed virtues of condurango. The American correspondent of the *Times*, writing from Philadelphia, says:—

"Reference has been made to the condurango plant of Ecuador, an alleged remedy for cancer, to which the attention of the United States' Government was called in an official communication from the American Minister in that country. Tho samples of the plant sent here were distributed by the State Department as an efficient remedy, and a physician was quoted as having experimented with it, and vouched for its healing powers. But it appears that a board of physicians have been conducting experiments in Washington at the hospitals, and, although they have made no final report, yet their judgment, so far as the experiments have gone, is against the plant, which is said to be entirely inefficacious. A decoction of the wood of the condurango is used, but careful analysis fails to show that it has any unusual properties. The bark contains an insoluble gum, but no recognized medicinal principle. Both the wood and the bark have been subjected to minute examination, and are pronounced worthless. The patients afflicted with cancer who have been placed under treatment with condurango are said to fail to show any improvement in condition. There are hints that the stir which has been created about this alleged remedy was a part of a well-laid plan to get extensive advertising for a new quack medicine, for which a patent has already been obtained, and of which condurango is an ingredient."

Whatever truth there might be in the suggestion of this writer, it is evident that he has very hazy ideas as to what is meant by the commonly-used but erroneous term, "patent medicine."

WRITERS ON SCIENCE.

At the recent Literary Fund dinner, Sir Henry Anderson proposed the toast of the "Writers on Science," coupling with it the name of Dr. B. W. Richardson, who, in returning thanks, spoke of the advantages enjoyed by poet, theologian, historian and novelist, compared with those of the writer on science. After speaking of the embarrassment he experienced in having to respond to a toast so novel to him, that he doubted any one had ever heard it proposed at a public assembly, he said that while the speech of Sir Henry Anderson had caused to pass before his mind a broken dream of the men classed as writers on science, the duty of replying had raised the question—

"Who are the writers on science? Are they as well known as other great writers? They are not. They are less fortunate, and, therefore, the more worthy of the exceptional honour you would bestow on them. Excuse me a moment or two while I indicate the peculiarities of the position of the writer on science. He is a man communicating to the world that which is, by comparison, new to the world. The poet can cast back for his models to a time when the Greeks had not so much as the figment of an alphabet. The theologian may go back for his lesson to the earliest manifestations of the life of intellect on the planet. The historian finds subject and matter ready for his hand from the oldest and remotest, as well as the newest, writings and traditions of races and peoples. The story-teller is embarrassed with the richness of the past, and troubled by the greed of his admirers for more of his work. These all, indeed, are but the continuing interpreters of things, events, thoughts, which every man who claims to read claims also to understand. The writer of science has none of these advantages; he is but newly born into an old world of thought, and is not simply telling of new wonders, but is often himself learning at the same time as he is instructing an audience unlearned in his knowledge. Thus he comes slowly into the recognized brotherhood of men of letters; at the best he speaks to but a small audience, amuses rarely, excites, sometimes without intention, hopes that are delusive, and requires always, in order that he may be fairly understood, a degree of patience it is vain to expect from the multitude. To these difficulties others are added belonging to the work he accomplishes. The most original writers on science are destroyed constantly by the magnitude and overpowering character of the work they have written, and by the practical results that spring from the work. In other literature the book produced lives as the book, and the learner from it, age after age, must go back to the fountain-head to drink and drink; in science-literature the book sinks into the fact it proclaims, and the fact remains the exclusive master of the field. A striking example of this flashes across my mind at the present moment. Every reading man and woman knows that in the reign of Queen Elizabeth the book of Shakespeare's plays had its origin, and nearly every one who has read that book (and who has not?) remembers the curious saying in it, 'I'll put a girdle round the world in forty minutes.' But how many are there who have read another great book of that same reign, entitled 'De Magnete,' or are aware that at the time when Shakespeare was writing his now familiar phrases, the author of the book on the magnet, the Queen's Physician, one William Gilbert, when his daily toils of waiting upon the sick were over, was working with his smith in the laboratory at his furnace, needle and compass, was writing up for the first time the word 'Electricity,' and was actually forging the beginnings of the very instruments that now, in less than forty seconds, put the girdle round the globe? Again, writers on science are lost sometimes in the blaze of their own success. They raise wonder by what they do, and fall beneath it. All knowledge newly born is miracle, but by-and-by, as the knowledge becomes familiar, the miracle ceases. In this way advances in science become part of our lives, while the men who write them down cease to us. When the Leyden jar was first described, Europe was mentally as well as physically convulsed with the thing; now a Leyden jar is a common object—we all know it; but how few know of Mr. Cuneus, who first described this instrument of science! The whole civilized world is cognizant in this day that communication from one part of the world to the other, by telegraph, is almost child's play; but how many have seen or heard of Mr. Cavallo's original essay on 'Electricity' as a means of communicating intelligence to places distant from each other? There is nothing more commonplace in our day than to know that a living human being can be placed in gentle sleep, and while in blissful oblivion, can have performed on him what were once the tortures of the surgeon's art; but how few have heard or seen Sir Humphry Davy's paper announcing to mankind this grand beneficence! These are some of the difficulties of writers on science.

"And yet there is another I must name, be it ever so lightly. I refer to the desperate struggles of the man of science who has nothing but science to carry him on in life. None but such as are placed as I am, practising as physicians in this metropolis of the world, and admitted at the same time, as men of science, into some knowledge of the subject upon which I now speak, can form a conception of the almost hopelessness of the position of the pure scholar in science. On this I say no more. I would awaken, but not weary, your sympathy. Ladies and gentlemen, in speaking of writers on science, you will say, perhaps, I have spoken in sadness. It is not so; much of the difficulty these writers have had to bear I recognize with admiration as their truest glory, and I see that hope for better worldly prospects is near. A profession of science is, no doubt, organizing. The world is at last asking men of science to employ themselves in teaching the world; and the teachers, bending to the labour, are, in their turn, willing to suspect that they are but as children, or at best, youths in the race after knowledge. This is most hopeful; and it is hopeful also to find that men like you, my Lord Bishop, who claim to be the conservators of a knowledge that was matured when science was unborn, are listening now to our scholars with an attentive ear, and are beginning to accept that the Lord of Nature, whether He reveal Himself to the ancient lawgiver in the burning bush that was not consumed, or to the modern astronomer in the burning glory of the omnipotent sun, is one and the same Lord. Thus there is hope, I may say certainty, in the future for the literature of science; for its poetry, its parables, its facts, nay, even for its religion. I might bring proof of this belief from many sides. I am content to find it here; that in an assembly so distinguished writers on science should have been so enthusiastically remembered, and my poor attempt at reply so generously received. For both kindnesses from my heart I thank you."

THE DISTRESSED CHEMISTS IN FRANCE.

It will be in the recollection of our readers that an application was made to the Council at their last meeting for assistance to the distressed chemists in Paris and the neighbourhood, and that the Council decided that they had not the power to apply the funds of the Society for such a purpose.

A subscription was, however, immediately started, and the following list has been handed to us for publication. We understand that contributions may be sent to Mr. Elias Bremridge, 17, Bloomsbury Square.

	£.	s.	d.
Atherton, J. H., Nottingham	1	1	0
Baildon, H. C., Edinburgh	2	2	0
Barnard, J., London	2	2	0
Bell, John, and Co., London	2	2	0
Betty, S. C., London	1	1	0
Bremridge, Elias, London	1	1	0
Carr, John, London	1	1	0
Deane, Henry, London	2	2	0
Flockhart, Duncan and Co., North Bridge, Edinburgh	3	3	0
Gale, S., London	2	2	0
Gardner and Ainslie, Edinburgh	1	1	0
Groves, T. B., Weymouth*	1	1	0
Haselden, A. F., London	2	2	0
Hills, T. H., London	2	2	0
Macfarlan and Co., Edinburgh	3	3	0
Mackay, John, Edinburgh	2	2	0
Middleton, F., London	2	2	0
Robertson, James, Edinburgh	2	2	0
Sandford, G. W., London	2	2	0
Smith, Edward, Torquay	1	1	0
Squire, Alfred, London	2	2	0

The Tonquin or Tonga bean (*Dipteryx odorata*, Willd.) is well-known for its agreeable hay-like fragrance. The only uses made of these beans are, we believe, for scenting snuff and as an ingredient in perfumed sachets, for which purposes they are imported into this country. It is not a little remarkable that a closely-allied species, *D. Eboënsis*, the Eboe-nut tree of the Mosquito shore,—which has a fruit and seed so nearly resembling the Tonquin as to be scarcely distinguishable,—has no fragrance whatever, but contains a large quantity of fatty oil, which is expressed by the natives and used as a hair oil. The "Mexican Balm" once so much advertised for promoting the growth of the hair, is said to be made from this oil.

In a Report to the Department of Agriculture at New York, Dr. C. C. Parry states the general result of his inquiries, made during a recent visit to Jamaica, in regard to the cultivation of the Cinchona in that island, and the possibility of its introduction into the United States. He says that the peculiar conditions of soil and climate required for the growth of the best varieties of the cinchona plant cannot be found within the limits of the United States, where no suitable elevations possessing an equable moist, cool climate, free from frost, can be met with. He thinks that the island of San Domingo, situated within the tropics, and traversed by extensive mountain ranges, attaining elevations of over 6000 feet above the sea, presents a larger extent of country specially adapted to the growth of cinchonas than any other insular region in the western hemisphere, and that the material for stocking successful plantations in that island might be conveniently and economically obtained from Jamaica.

The official *Preussische Staatsanzeiger* states that Mr. E. Gressler, of Halle, the well-known pharmacist and manufacturer of mineral-water apparatus, has placed at the disposal of the Government one of his apparatus to the value of 150 thalers, to be given as a present to a pharmacist who has distinguished himself either in the execution of his duties as field apothecary, or in open field against the enemy.

* For the distressed chemists of France *generally*.

Transactions of the Pharmaceutical Society.

EXAMINATION IN EDINBURGH.

July 18th, 1871.

Present—Messrs. Ainslie, Aitken, Brown, Gilmour, Kemp and Young.

FIRST, OR PRELIMINARY EXAMINATION.

Twelve candidates were examined; the following nine passed, and were declared qualified for registration as

APPRENTICES OR STUDENTS.

Macdonald, Alexander........Edinburgh.
Dott, David Brown..........Edinburgh.
Equal. { Campbell, Colin............Dumbarton.
Grant, Donald..............Elgin.
Strang, David James........Perth. }
Equal. { Graham, Alexander..........Leith.
Maclean, Alexander Edward..Edinburgh. }
Equal. { Couper, Charles James......Edinburgh.
Mortimer, Robert............Edinburgh. }

The above names are arranged in order of merit.

The under-mentioned submitted evidence of having passed certain examinations, which was accepted in lieu of the Preliminary Examination:—

Wilson, David Morgan Weir..Edinburgh.

MINOR EXAMINATION.

The following seven candidates were examined, and were declared qualified for registration as

CHEMISTS AND DRUGGISTS.

Woods, Joseph Henry........Warrington.
Bayne, Charles..............Edinburgh.
Meldrum, David.............Edinburgh.
Macmillan, James Laker......Glasgow.
Gardner, William............Inverkeithing.
Equal. { Alexander, Hugh Dalrymple..Edinburgh.
Wilson, David Morgan Weir..Edinburgh. }

The above names are arranged in order of merit.

MODIFIED EXAMINATION.

The three following candidates were examined, and declared qualified for registration as

CHEMISTS AND DRUGGISTS.

Dickson, William............Edinburgh.
Pasco, John................Manchester.
Stanway, Edward Thomas....Wolverhampton.

Provincial Transactions.

LEICESTER CHEMISTS' AND APPRENTICES' ASSOCIATION.

The Half-yearly Meeting of the above Association was held at the Rooms, Halford Street, on Friday, August 4th; the President (Mr. W. B. Clarke) in the chair. Some preliminary business having been transacted, the Honorary Secretary, Mr. T. Wright, read the following report:—

"During the session, one member has passed the Minor Examination with honours, and two have succeeded in the Preliminary. During the half-year five papers have been read upon subjects of great interest to pharmacists; the Chemistry, Botany, Materia Medica, and Latin Classes have been regularly attended, the average number present at each class being eight. W. S. Grigsby, Esq., has very kindly taken the management of a class for the preparation of students for the Preliminary Examination; and as this gentleman's services are entirely voluntary, the Committee take this opportunity of tendering him their grateful thanks, especially as the rapid advance of the apprentices of the Association proves that the talents of Mr. Grigsby, coupled with his admirable method of teaching, have not been thrown away.

"The financial affairs of the Association are not in so prosperous a condition as usual, owing to the great expense of the very convenient rooms in Halford Street; but the Committee trust, with the sustained help of the principals, to meet the difficulty. Finally, the Committee believe they have reason to congratulate the members upon the great success the Association has had, and is still increasingly having, in achieving the purposes for which it was formed."

The following officers were then elected by ballot:—*President:* Mr. W. E. Hill (A.P.S.). *Vice-President:* Mr. T. Wright (A.P.S.). *Treasurer:* Mr. W. B. Clarke (P.C.). *Hon. Secretary:* Mr. W. B. Blunt (A.P.S.). *Committee:* Mr. E. H. Butler (A.P.S.); Mr. W. Thirlby (A.P.S.); Mr. S. H. Cadoux.

The balance sheet showed a balance due to Treasurer of £3. 17*s.* 4½*d.*, which by a repayment from the Pharmaceutical Society of £4. 18*s.* 8*d.* expended in books, would be converted into a balance in hand of £1. 1*s.* 3½*d.*

A programme of lectures, etc., extending from August 10, 1871, to February 1, 1872, has been issued.

Proceedings of Scientific Societies.

BRITISH PHARMACEUTICAL CONFERENCE.

(*Continued from page* 132.)

Mr. A. H. Mason, F.C.S., read a report on "The Chloral of Trade."

The President said that, before asking for any discussion on this paper,—and he knew there were many who would take part in it,—there was another by Mr. M. W. Pattison Muir, F.C.S., which he thought might be also read.

At this point Dr. Edwards entered the room, and was received with loud applause.

The President said he wished to express the satisfaction he had of seeing Dr. Edwards present.

Dr. Edwards said it gave him pleasure to be among so many friends; and, in speaking of the Pharmaceutical Society of Quebec, said it had some privileges which he might have an opportunity of referring to by-and-by.

Mr. Pattison Muir's paper on "An Examination of Samples of Commercial Chloral Hydrate" was then read by Dr. Attfield.

The author said that the experiments had been undertaken, not with any intention of adding new facts or new reasonings to the science of pharmaceutical chemistry, but rather with the view of showing whether or not the chloral hydrate in common use among druggists and pharmacists is of fair average purity. He had endeavoured to answer, for each sample examined, the following questions:—

(1.) Does the sample yield, on treatment with a caustic alkali, such a percentage of chloroform as might reasonably be expected.

(2.) Does the sample contain any, or any appreciable, amount of chloral alcoholate?

And lastly, is the chloral hydrate now generally sold by druggists of fair average quality and purity?

The results at which he had arrived were,—

(1.) Generally the samples were of a fair average quality.

(2.) None of them, so far as could be inferred from the experiments, contained chloral alcoholate.

(3.) The purest was that sold in small transparent pieces, nearly dry to the touch, and not having a very strong pungent odour.

(4.) The various samples varied in the amount of chloroform yielded,—chiefly, it appeared, on account of the time each had stood in the shop.

Generally, the experiments showed that the chloral hydrate at present sold by pharmaceutical chemists is of a fair degree of purity.

The PRESIDENT said he would be glad to hear any one who would give some results of his experiments. He saw Dr. Paul, Mr. Wood, Mr. Williams and others present who, he had no doubt, would take part in the discussion.

Dr. PAUL said he had nothing further to say than that both the papers seemed to confirm the general result arrived at by several experimenters some time ago, viz. that the hydrate of chloral of commerce was so far a pure article that the amount of impurity varied within the narrow limits of about 5 per cent.; and it was only in a few cases that it came up to as much as 5 per cent. In those cases where the amount of hydrate of chloral in the commercial article was 1, or 2, or 3, or 5 per cent. less than if the article were absolutely pure hydrate of chloral, the impurity was in most cases water, due to the hygroscopic nature of the substance. In the specimens he himself examined there was only one case of alcoholate met with, and that was not a bought sample, but one obtained as a specimen from a house in the City reported to have been selling it. Another impurity that was observed in one or two cases was a flocculent deposit that was formed when the ammonia-test was applied. That deposit obscured the test, and one was not able to tell how much chloroform was produced, because the deposit collected between the chloroform and the watery liquid rendered indistinct the line of separation between the two substances.

Mr. WOOD said that in the remarks he was about to make he would probably run somewhat counter to the general current of opinion, but he must protest against attaching too much importance to the chloroform-test. It occurred to him that it was leading them rather astray, and likely to do more harm than good. No doubt it was very valuable, and served a useful purpose when it was suggested by Mr. Williams, but what they required at the present time, he believed, was a means of recognizing that they had chloral hydrate, and no other chlorine substance or impurity which might be formed during the process of manufacture. The chloroform-test was not required, as it appeared to him, because it was not a sufficient means of ascertaining the purity in these respects, and because the presence or absence of a little more or less water in a chloral hydrate was a matter of slight importance to them, provided that they had pure chloral and no other substance. It could merely affect the commercial and not the medicinal value. He believed it was the general experience, as stated by Dr. Paul and others, that what caused the principal variations in the chloroform results was the presence of rather more or less water in the sample they were examining. In the manufacture of chloral it did appear probable that there were produced certain other chlorinated substances, and that these might remain associated with the chloral in greater or less proportion; and those substances were likely to have considerable influence on the medicinal properties of the article. There was a very great temptation to every manufacturer to stop the action of the chlorine upon the alcohol, as soon as it would yield a crystallizable article that was saleable; but still at that time it might retain more or less, and sometimes a considerable portion, of those other products that had been first formed, and from which the chloral had been derived. An ethereal oily liquid, of high boiling-point, described by Liebig, Dumas and others as the original chloric ether, was the body first formed by the action of chlorine on alcohol. It was that body which ultimately yielded chloral by the further action of chlorine, and it was that which would be likely to influence its medicinal efficacy. Moreover, alcohol of commerce was by no means pure, it contained considerable quantities of fusil oil and other products; and if in the manufacture of chloral such spirit had been used, they would have the products of the action of chlorine on those other substances which were impurities in the alcohol. German spirit was known to contain appreciable quantities of aldehyd; and Dr. Hofmann had recently shown that aldehyd yielded by the action of chlorine a crystalline body resembling chloral, but having an entirely different composition. As far as his experience went, the chloroform-test failed to be of much use in indicating the presence or absence of such substitution products. Many of these substances did give an oily liquid on treatment with an alkali. It might or might not be chloroform. It might consist of that alone, or it might contain other liquids. They never applied any further means of recognizing the purity of the chloroform layer. They had no means of examining it. It appeared to him, therefore, that the test was apt to mislead them; for if they got a good result in point of quantity they thought the sample good. But what they really required was the means of testing chloral, so as to recognize the presence of other chlorine products. He was inclined to regard the boiling-point as a more valuable test to apply. Unfortunately it seemed impossible to distil hydrate of chloral to absolute dryness without increasing the boiling-point. He thought they required some test which would show the presence of other substances than chloral, rather than being particular as to whether they got 1 or 2 per cent. of water in excess.

Dr. PAUL said he wished to express the satisfaction with which he had heard Mr. Wood's remarks. He thought he had taken the true chemist's point of view, and had raised a question as to the purity of hydrate of chloral in a far more important manner than had yet been done. Looking to the materials used for the manufacture of hydrate of chloral, there was, he thought, no doubt that there might be other chlorine compounds in the chloral hydrate of commerce. He was sure that everybody would agree with him in hoping that before the Conference met next year Mr. Wood would exercise the ability and opportunities he possessed of carrying out an inquiry in such a way that he could place before them some positive evidence on the matter. He did not know any one who could do it so well.

Mr. WILLIAMS said he agreed with Mr. Wood as to the importance of discovering other chlorine compounds in chloral. He explained some experiments he had made in distillation, and said he thought the redistilled chloral much sweeter and nicer in flavour than the chloral from which it was prepared. It was all the purer, and warranted the expense of distillation.

Mr. HANBURY said he did not understand the author of the first paper to say, whether the samples he examined had been obtained from manufacturers who were previously informed that they were for analysis, or in the ordinary way of trade. That was one point he thought they should know.

Mr. UMNEY said the author had proved that chloral hydrate had been manufactured in large quantities in this country. He thought they were entitled to know where it was manufactured, as they were told that there was only one place where it was produced. Perhaps Mr. Mason could enlighten them on the subject.

Mr. MASON said he applied to manufacturers for chloral hydrate and they sent it to him. One firm refused to entrust him with a sample of their manufacture.

Mr. UMNEY said he knew one house that had tried to manufacture it, but the product was mixed with alcoholate. Perhaps Mr. Wood could give some information on the subject.

Mr. WOOD said he thought it was a misfortune to introduce manufacturers' names into such matters; but as the question had been asked, he might state that he knew of a firm in London, the one named by Mr. Mason as sending him samples, that made large quantities of hydrate chloral, and he believed it was in a considerable state of purity.

Mr. Kerr (Dundee) asked if he could be informed whether there was any general test of smell by which a good sample of hydrate of chloral could be distinguished from a bad one. On one occasion he received a sample which had not the sweet smell of chloral, but an acrid smell. He asked the opinion of a firm on the subject, and they told him that it was good, and that the smell varied. When the stopper of a bottle was taken out it left the chloral different from what it was when quite close. It would be useful to dispensing chemists to know whether there was any test such as he had indicated.

Mr. Atkins said he also wished to put a question. He had not yet quite learned from the debate whether the cake or the crystalline form was to be considered the best and purest specimen for dispensing.

Mr. Mason said he had already answered both questions.

Dr. Attfield said Mr. Muir seemed to have come to the conclusion that the crystalline was the best.

Mr. Robins (London) said that a gentleman of his acquaintance had got some pounds of the crystalline substance, but after trying it he gave it up, and returned to the use of the cake. He said that in many cases he did not find the action so good. He (Mr. Robins) thought it would be well to know if similar results were found in other cases.

The President, in regard to Mr. Kerr's question, said that probably the sense of smell would not be sufficient as a substitute for a chemical test. In the case of pure chloral the pungent smell disappeared, by constant opening of the bottle. The discussion seemed to be satisfactory as to the state of chloral as a manufactured product. In his own experience at Bristol he had found it to give him satisfaction.

Brief Remarks on the Bark of Rhamnus Frangula, or Black Alder Tree, a Shrub of the North of Europe (Pentandria Monogynia).

BY H. C. BAILDON, EDINBURGH.

Some time since a gentleman from Holland applied to me to prepare for him a decoction of the *Rhamnus Frangula* bark. The bark he brought with him, having previously found that he could not obtain it in this country. He spoke most enthusiastically of its good properties as a gentle cathartic, which had proved very beneficial to himself, and which was much used and esteemed by the medical profession in Holland. He kindly offered to procure for me a small quantity of the bark. To my surprise, I shortly afterwards received a bale containing nearly a quarter of a cwt., accompanied by the following letter. He writes, "I hope you will find it giving as much benefit generally as I have derived from it personally. The preparation of my Dutch physician was 3 or 4 drams of bark to a pint of water boiled down to half a pint. Two or three tablespoonfuls occasionally night and morning, as an aperient. Than this nothing can be more simple or less injurious, and it does not require increase of dose, but the contrary."

I am aware that this drug is not altogether unknown in this country, though I believe rarely or never used. In the 2nd volume of the first series of the Pharmaceutical Journal, page 721, I find a letter signed George Mennie, Plymouth, speaking very favourably of it as a purgative and alterative, and again in the 9th volume, page 537, there is an analysis by M. Benswanger.

I have repeatedly taken the decoction myself, and find the taste not unpleasant, with a slight prussic acid flavour, of which the analysis shows traces. It operates gently as an aperient, without griping, in doses of 2 or 3 tablespoonfuls. It appears to me to possess properties which should in many cases render it a valuable substitute for senna,—which is often found drastic in its effects, and is nauseous to take,—and to be especially suitable for children.

In Holland it must be very plentiful, as it was charged me only at the rate of about 10*d.* per lb., including cost of carriage. A specimen of the bark and decoction is now upon the table.*

The Conference then adjourned from half-past twelve to two o'clock.

BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

On Thursday, August 3, the business of the sections commenced. The meetings were held in the various class-rooms of the University, the time saved to visitors by the contiguity of the places of meeting being very considerable.

In Section A. (Mathematical and Physical Science), Professor P. G. Tait, the President, delivered an address, in which he claimed that the grand test of the science, and the proof of its being a reality, and not a mere invention of new terms and squabbling as to what they shall mean, is that it is ever advancing. There is no coming back at the end of a century or so into the old positions, and fighting the selfsame battle over again under slightly different banners. The sad fate of Newton's successors ought ever to be a warning to us. Trusting to what he had done, they allowed mathematical science to die out in this country, at least as compared with its immense progress in Germany and France. If the successors of Davy and Faraday pause to ponder even on their achievements, we shall soon be again in the same state of ignominious inferiority. Even as it is, though we have among us many names as justly great as any that our rivals can produce, we have also (even in our educated classes) such an immense amount of ignorance, and consequent credulity, that it seems matter for surprise that true science is able to exist. Spiritualists, circle squarers, perpetual motionists, believers that the earth is flat and that the moon has no rotation, swarm about us. This is characteristic of all inferior races, but it is consolatory to remember that, in spite of it, they soon become extinct. Your quack has his little day, and disappears, except to the antiquary. But in science nothing of value can ever be lost; it is certain to become the stepping-stone on the way to further truth. Still, when our stepping-stones are laid, we should not wait till others employ them.

Professor James Thomson read a paper entitled "Speculations on the Continuity of the Fluid State of Matter." The author referred to the discovery of Dr. Andrews, that there is gradual transition between the ordinary liquid and the ordinary gaseous states of the same matter, by courses passing through temperatures and pressures above those at which boiling can take place, and showed that there is probably also a theoretical continuity, having a real and true significance, directly across temperatures and pressures of boiling-points. He also drew the attention of the section to the existence for each of the various substances (water or carbonic acid, for instance) of a remarkable point of pressure and temperature, at which alone the substance can exist in three states, solid, liquid and gaseous, together in contact with one another. This point of pressure and temperature he designated the triple point.

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* We are requested to state that Mr. Baildon will, with pleasure, supply members of the Conference with specimens of this bark, to afford them the opportunity of testing its merits.—Ed. Pharm. Journ.

Dr. Carpenter read a paper on the "Thermo-Dynamics of the General Oceanic Circulation," which gave rise to considerable discussion, in which Sir William Thomson, Professor Stokes, and Professor G. C. Foster took part.

Section B.—Chemical Science.

This section met under the presidency of Dr. Andrews, F.R.S., who, in his address, spoke of the difficulty of giving a historical review of the science, more particularly in organic chemistry, where it was impossible to grapple with the large number of valuable works which even a few months produce. We give an abstract of some of the principal topics referred to. In commencing, he remarked that amidst the vicissitudes to which scientific theories are liable, it was scarcely to be expected that the discarded theory of phlogiston should be resuscitated in our day, and connected with one of the most important generalizations of modern science. The phlogistic theory, elaborated nearly two hundred years ago by Beecher and Stahl, was not, it now appears, wholly founded on error; on the contrary, it was an imperfect anticipation of the great principle of energy, which plays so important a part in physical and chemical changes. The disciple of phlogiston, ignorant of the whole history of chemical combination, connected, it is true, his phlogiston with one only of the combining bodies, instead of recognizing that it is eliminated by the union of all.

Dr. Andrews referred to a recent attempt to ignore the labours of Black and his contemporaries, and to attribute the foundation of modern chemistry to Lavoisier alone; and said that, through the kindness of Dr. Black's representatives, he had been permitted to examine his correspondence, which has been carefully preserved, and had been so fortunate as to find in it three original letters from Lavoisier to Dr. Black. They were written in 1789 and 1790, and they appear to comprise the whole of the correspondence on the part of Lavoisier which passed between those distinguished men. He would crave permission to have them printed as an appendix to his address. Lavoisier, it will be seen, addresses Black as one whom he was accustomed to regard as his master, and whose discoveries had produced important revolutions in science. It may indeed be said with truth that Lavoisier completed the foundation on which the grand structure of modern chemistry has since arisen; but Black, Priestley, Scheele and Cavendish were before Lavoisier, and their claims to a share in the great work are not inferior to those of the illustrious French chemist.

Among the questions of general chemistry, few have of late attracted more attention than the relations which subsist between the chemical composition and refractive power of bodies for light. About twenty years ago Delffs remarked that the refractive indices of the compound ethers increase with the atomic weight, and that isomeric ethers have the same refractive indices. The later researches of Gladstone and of Landolt have, on the whole, confirmed these observations, and have shown that the specific refractive power depends chiefly on the atomic composition of the body, and is little influenced by the mode of grouping of the atoms. These inquiries have gone further, and have led to the discovery of the refraction equivalents of the atoms. By comparing the refractive power of compound bodies differing from one another by one or more atoms of the same element, Landolt succeeded in obtaining numbers which express the refraction equivalents of carbon, hydrogen and oxygen, and corresponding numbers have been obtained for other elements by Gladstone and Haagen. The whole subject has been recently discussed and enriched with many new observations in an able memoir by Gladstone. As might be expected in so novel and recondite a subject, some anomalies occur which are difficult to explain. Thus, hydrogen appears in different classes of compounds with at least two refraction equivalents, one three times as great as the other; and the refraction equivalents of the aromatic compounds and their derivations as given by observation are, in general, higher than the calculated numbers.

In a "Report on the Heat of Combination" which was made to this Association in 1849, the existence of a group of isothermal bases was pointed out. "As some of the bases,—potash, soda, baryta, strontia,—" it was remarked, "form what we may perhaps designate an isothermal group, such bases will develope the same, or nearly the same heat, in combining with an acid, and no heat will be disengaged during their mutual displacements." The latest experiments of Thomson have given a remarkable extension to this group of isothermal bases. He finds that the hydrates of lithium, thallium, calcium and magnesium produce, when all corrections are made, the same amount of heat on being neutralized by sulphuric acid as the four bases before mentioned. The hydrate of tetramethylammonium belongs to the same class of bases. Ethylamin, on the other hand, agrees with ammonia, which, as has long been known, gives out less heat in combining with the acids than potash or soda. An investigation of the amount of heat evolved in the combustion of coal of different kinds has been made by Scheurer-Kestner and Meusnier, accompanied by analyses of the coal. Coal rich in carbon and hydrogen disengages more heat in burning than coal in which those elements are partially replaced by oxygen. After deducting the cinders, the heat produced by the combustion of 1 gramme of coal varied from 8215 to 9622 units.

Tyndall has given an account of his experiments on the action of a beam of strong light on certain vapours. He finds that there is a marked difference in the absorbing power of different vapour for the actinic rays. Thus, the nitrate of amyl in the state of vapour absorbs rapidly the rays of light competent to decompose it, while iodide of allyl in the same state allows them freely to pass. Morren has continued these experiments in the south of France, and, among other results, he finds that sulphurous acid is decomposed by the solar beam.

Roscoe has prosecuted the photo-chemical investigations which Bunsen and he began some years ago. For altitudes above 10 degrees the relation between the sun's altitude and the chemical intensity of light is represented by a straight line. Till the sun has reached an altitude of 20 degrees, the chemical action produced by diffused daylight exceeds that of the direct sunlight. The two actions are then balanced, and at higher elevations the direct sunlight is superior to the diffused light. The supposed inferiority of the chemical action of light under a tropical sun to its action in higher latitudes proves to be a mistake. According to Roscoe and Thorpe, the chemical intensity of light at Pará under the equator, in the month of April, is more than three times greater than at Kew in the month of August.

Hunter has given a great extension to the earlier experiments of Saussure on the absorptive power of charcoal for gases. Cocoa-nut charcoal, according to Hunter's experiments, exceeds all other varieties of wood charcoal in absorptive power, taking up at ordinary pressures 170 volumes of ammonia and 69 of carbonic acid. Methylic alcohol is more largely absorbed than any other vapour at temperatures from 90° to 127°; but at 159° the absorption of ordinary alcohol exceeds it. Cocoa-nut charcoal absorbs 44 times its volume of the vapour of water at 127°. The absorptive power is increased by pressure.

Last year two new processes for improving the manufacture of chlorine attracted the attention of the section; one of these has already proved to be a success, and I am glad to be able to state that Mr. Deacon has recently overcome certain difficulties in his method, and has obtained a complete absorption of the chlorine. May we hope to see oxygen prepared by a cheap and continuous process from atmospheric air? With baryta the problem can be solved very perfectly, if not economically. Another process is that of Tessier de Mothay, in which the manganate of potassium is decomposed by a current of superheated steam, and afterwards revived by being heated in a current of air. A company has lately been formed in New York to apply this process to the production of a brilliant house-light. A compound argand burner is used, having a double row of apertures; the inner row is supplied with oxygen, the outer with coal-gas or other combustible. The applications of pure oxygen, if it could be produced cheaply, would be very numerous, and few discoveries would more amply reward the inventor. Among other uses, it might be applied to the production of ozone free from nitric acid by the action of the electrical discharge, and to the introduction of that singular body in an efficient form into the arts as a bleaching and oxidizing agent. Tessier de Mothay has also proposed to prepare hydrogen gas on the large scale by heating hydrate of lime with anthracite.

The researches of Roscoe have made us acquainted, for the first time, with metallic vanadium. Berzelius obtained brilliant scales which he supposed to be the metal, by heating an oxychloride in ammonia, but they have proved to be a nitride. Roscoe prepared the metal by reducing its chloride in a current of hydrogen, as a light grey powder, with a metallic lustre under the microscope. It has a remarkable affinity both for nitrogen and silicon. Like phosphorus, it is a pentad, and the vanadates correspond in composition to the phosphates, but differ in the order of stability at ordinary temperatures, the soluble tribasic salts being less stable than the tetrabasic compounds.

In organic chemistry the labours of chemists have been of late largely directed to a group of hydrocarbons which were first discovered among the products of the destructive distillation of coal or oil. The central body round which these researches have chiefly turned is benzol, whose discovery will always be associated with the name of Faraday. With this body naphthaline and anthracene form a series, whose members differ by C_4H_2, and their boiling-points by about 140°. The recent researches of Liebermann have proved, as was before suspected, that chrysene is a fourth member of the same series. I may add that ethylene, which boils at about 70°, corresponds in composition and boiling-point to a lower member of the same series. Kekulé propounded some time ago with great clearness the question as to whether the six atoms of hydrogen in benzol are equivalent, or on the contrary play dissimilar parts. According to the first hypothesis, there can be only one modification of the mono- and penta-derivatives of benzol; while three modifications of the bi-, tri-, and tetra-derivatives are possible. On the second hypothesis, two modifications of the mono-derivatives are possible, and in general a much larger number of isomeric compounds than on the first hypothesis. Such is the problem which has of late occupied the attention of some of the ablest chemists of Germany, and has led to a large number of new and important investigations. The aromatic hydrocarbons, toluol, xylol, etc., which differ from one another by CH_2, have been shown by Fittig to be methyl derivatives of benzol. According to the first of the two hypotheses to which I have referred, only one benzol and one methyl benzol (toluol) are possible, and accordingly no isomeric modifications of these bodies have been discovered. But the three following members of the series ought each to be capable of existing in three distinct isomeric forms. The researches of Fittig had already established the existence of two isomeric compounds having the formula C_8H_{10}—methyl toluol obtained synthetically from toluol, and isoxylol prepared by the removal of an atom of methyl from the mesytelene of Kane. The same chemist has since obtained the third modification, orthoxylol, by the decomposition of paraxylylic acid. These three isomeric hydrocarbons may be readily distinguished from one another by the marked difference in the properties of their trinitro-compounds, and also by their different behaviour with oxidizing agents.

Baeyer has prepared artificially picoline, a base isomeric with aniline, and discovered by Anderson in his very able researches on the pyridine series. Of the two methods described by Baeyer, one is founded on an experiment of Simpson, in which a new base was obtained by heating tribromallyl with an alcoholic solution of ammonia. By pushing further the action of the heat, Baeyer succeeded in expelling the whole of the bromine from Simpson's base in the form of hydrobromic acid, and in obtaining picoline. The same chemist has also prepared artificially collodine, another base of the pyridine series. To this list of remarkable synthetical discoveries, another of the highest interest has lately been added by Schiff—the preparation of artificial coniine. He obtained it by the action of ammonia on butyric aldehyde (C_4H_8O).

Valuable papers on alizarine have been published by Perkin and Schunck. The latter has described a new acid—the anthraflavic—which is formed in the artificial preparation of alizarine. Madder contains another colouring principle, purpurine, which, like alizarine, yields anthracene when acted on by reducing agents, and has also been prepared artificially. These colouring principles may be distinguished from one another, as Stokes has shown, by their absorption bands; and Perkin has lately confirmed by this optical test the interesting observation of Schunck, that finished madder prints contain nothing but pure alizarine in combination with the mordant employed.

Hofmann has achieved another triumph in a department of chemistry which he has made peculiarly his own. In 1857 he showed that alcohol bases, analogous to those derived from ammonia, could be obtained by replacement from phosphuretted hydrogen; but he failed in his attempts to prepare the two lower derivatives. These missing links he has now supplied, and has thus established a complete parallelism between the derivatives of ammonia and of phosphuretted hydrogen. The same able chemist has lately described the aromatic cyanates, of which one only, the phenylic cyanate (CO, C_6H_5, N), was previously known, having been discovered about twenty years ago by Hofmann himself. He now prepares this compound by the action of phosphoric anhydride on phenylurethane, and by a similar method he has obtained the tolylic, xylylic, and naphthylic cyanates.

Stenhouse had observed many years ago that when aniline is added to furfurol, the mixture becomes rose-red, and communicates a fugitive red stain to the skin, and also to linen and silk. He has lately resumed the investigation of this subject, and has obtained two new bases, furfuraniline and furfurtoluidine, which, like rosaniline, form beautifully coloured salts, although the bases themselves are nearly colourless or of a pale brown colour. The furfuraniline hydrochlorate ($C_{17}H_{19}O_2N_2Cl$) is prepared by adding furfurol to an alcoholic solution of aniline hydrochlorate containing an excess of aniline. We have also from Stenhouse a new contribution to the history of orcin, in continuation of his former masterly researches on that body. He has prepared the trinitroorcin ($C_7H_5(NO_2)_3O_2$), a powerful acid having many points of resemblance to picric acid. In connection with another research of Stenhouse, made many years ago, it is interesting to find his formula for esexanthron, which was also that of Erdmann, confirmed by the recent experiments of Baeyer.

The interesting work of Dewar on the oxidation of picoline must not be passed over without notice. By the action of the permanganate of potassium on that body, he has obtained a new acid which bears the same relation to pyridine that phthalic acid does to benzol. Thorpe and Young have published a preliminary notice of some results of great promise, which they have obtained by exposing paraffin to a high temperature in closed vessels. By this treatment it is almost completely resolved into liquid hydrocarbons, whose boiling-points range from 18° C. to 300° C.; those boiling under 100° C. have been examined, and consist chiefly of olefines. In connection with this subject, it may be interesting to recall the experiments of Pelouze and Cahours on the Pennsylvanian oils, which proved to be a mixture of carbohydrogens belonging to the marsh-gas series.

An exposition of Berthelot's method of transforming an organic compound into a hydrocarbon containing a maximum of hydrogen, has appeared in a connected form. The organic body is heated in a sealed tube, with a large excess of a strong solution of hydriodic acid, to the temperature of 250°. The pressure in these experiments Berthelot estimated at 100 atmospheres. He has thus prepared ethyl hydride (C_2H_6) from alcohol, aldehyd, etc.; hexyl hydride (C_6H_{14}) from benzol. Berthelot has submitted both wood charcoal and coal to the reducing action of hydriodic acid, and, among other interesting results, he claims to have obtained in this way oil of petroleum.

By the action of chloride of zinc upon codeia, Matthiessen and Burnside have obtained apocodeia, which stands to codeia in the same relation as apomorphia to morphia, an atom of water being abstracted in its formation. Apocodeia is more stable than apomorphia, but the action of reagents upon the two bases is very similar. As regards their physiological action, the hydrochlorate of apocodeia is a mild emetic, while that of apomorphia is an emetic of great activity. Other bases have been obtained by Wright by the action of hydrobromic acid on codeia.

We are indebted to Crum-Brown and Fraser for an important work on the relation between chemical constitution and physiological action. It has long been known that the ferrocyanide of potassium does not act as a poison on the animal system, and Bunsen has shown that the kakodylic acid, an arsenical compound, is also inert. Crum-Brown and Fraser find that the methyl compounds of strychnia, brucia, and thebaia are much less active poisons than the alkaloids themselves, and the character of their physiological action is also different. The hypnotic action of sulphate of methyl-morphium is less than that of morphia. But a reverse result occurs in the case of atropia, whose methyl and ethyl derivatives are much more poisonous than the salts of atropia itself.

Before proceeding to the subject of fermentation, I may refer to Apjohn's chemico-optical method of separating cane sugar, inverted sugar, and grape sugar from one another when present in the same solution, by observing the rotative power of the syrup before and after inversion, and combining the indications of the saccharometer with the results of an analysis of the same syrup after inversion. Heisch's test for sewage in ordinary water is also deserving of notice. It consists in adding a few grains of pure sugar to the water, and exposing it freely to light for some hours, when the liquid will become turbid from the formation of a well-marked fungus, if sewage to the smallest amount be present. Frankland has made the important observation that the development of this fungus depends upon the presence of a phosphate, and that if this condition be secured, the fungus will appear even in the purest water.

The nature of fermentation, and in particular of the alcoholic fermentation, has been lately discussed by Liebig with consummate ability, and his elaborate memoir will well repay a careful perusal. Dr. Williamson has also given a most instructive account of the subject, particularly with reference to the researches of Pasteur, in his recent Cantor lectures. A brief statement of the present position of the question will therefore not be out of place here. It is now thirty-four years since Cagniard de la Tour and Schwann proved by independent observations that yeast globules are organized bodies capable of reproduction by gemmation; and also inferred as highly probable that the phenomena of fermentation are induced by the development or living action of these globules. These views, after having fallen into abeyance, were revived and extended a few years ago by Pasteur, whose able researches are familiar to every chemist. Pasteur, while acknowledging that he was ignorant of the nature of the chemical act, or of the intimate cause of the splitting up of sugar in the alcoholic fermentation, maintained that all fermentations, properly so called, are correlative with physiological phenomena. According to Liebig, the development and multiplication of the yeast-plant, or fungus, is dependent upon the presence and absorption of nutriment which becomes part of the living organism, while in the process of fermentation, an external action takes place upon the substance, and causes it to split up into products which cannot be made use of by the plant. The vital process and the chemical action, he asserts, are two phenomena which in the explanation must be kept separate from one another. The action of a ferment upon a fermentable body he compares to the action of heat upon organic molecules, both of which cause a movement in the internal arrangement of the atoms. The phenomena of fermentation Liebig refers now as formerly to a chemico-physical cause, the action, namely, which a substance in a state of molecular movement exercises upon another of highly complex constitution, whose elements are held together by a feeble affinity, and are, to some extent, in a state of tension or strain. Baeyer, who considers that in the alcoholic and lactic fermentations one part of the compound is reduced and another oxidized, adopts the view of Liebig that the molecules of sugar which undergo fermentation do not serve for the nourishment of the yeast-plant, but receive an impulse from it. All are, however, agreed that fermentation is arrested by the death of the plant, and even a tendency to the acetous fermentation in wine may be checked, as Pasteur has shown, by heating the wine to a temperature a little below boiling-point in the vessel in which it is afterwards to be kept.

Dr. Andrews concluded by saying that he could not refrain from bearing tribute to the great ability and indomitable perseverance which characterize the labourers in the great field of organic chemistry. It would scarcely be possible to conceive any work more intelligently undertaken or more conscientiously performed than theirs, yet much of it, from its abstruse character, receiving little sympathy or encouragement except from the band of devoted men who have made this subject the chief pursuit of their lives. They will, however, find their reward in the consciousness that they have not lived in vain, but have been engaged, and successfully engaged, in the noble enterprise of extending for the benefit of the human family the boundaries of scientific knowledge. Nor is there any real ground for discouragement: Faraday, Graham, Magnus, and Herschel, who have left their impress on this age, were all distinguished chemical as well as physical discoverers; and the relations of the sciences are becoming every day so intimate that the most special research leads often to results of wide and general interest.

BRITISH MEDICAL ASSOCIATION.

The British Medical Association commenced its thirty-ninth annual Meeting on Tuesday evening, August 8, at the Assembly Rooms, Plymouth.

Dr. Charlton, of Newcastle, took the chair, and, after the reception of an address of welcome from the Mayor and Corporation of Plymouth, proceeded to deliver his valedictory address. He said that, contrary to the expectations indulged in when he assumed office at the Newcastle meeting, the past year, instead of being one of great excitement among those interested in medical legislation, had been singularly barren of incident in regard to that which is the question of questions to the profession,—the all-important subject of medical reform. Twelve months ago a session of Parliament was hoped for in which this subject would have occupied no small portion of the time of our legislators, and preparations were made for the struggle. But the late session had been singularly unproductive in reference to general questions, and it was not matter for surprise that much attention had not been given to medical reform, a subject interesting to, and understood by, few beyond those who had a practical experience of its necessity. Questions of the most important character had been lost sight of in the din of contending armies across the Channel; but, in the meantime, leisure had been gained to analyse and improve upon the measures of reform proposed during the last twelve months. No measure of reform, they could boldly say, would ever be acceptable to the profession which did not embrace the two propositions, (1) the single portal by which all shall enter the profession, and (2) the radical and thorough reform of the Medical Council. He then introduced his successor, Dr. John Whipple, in whose favour he vacated the presidential chair.

The President-elect then proceeded to deliver his inaugural address, in which he deviated from the usual routine of discussing subjects of solely professional interest, and gave some interesting details in the history of Plymouth, the town in which they were assembled. He justified this course on the ground that professional experience abundantly testified that the mind could not bear too heavy a strain, or digest at once more than a fair proportion of substantial or stimulating diet. He wished to send them forth to the details and duties of their respective sections with their digestive faculties unwearied and their mental grasp unimpaired by any homœopathic treatment of his own. If it were true that the science of agriculture depended much upon a due application of the rotation of crops, it would not be far wrong to adopt a similar system to an analogous field—the human mind. In both cases the same condition of an ultimate return was a judicious appreciation of, and a proper deference to, those elements which might not inaptly be termed the surface and hidden depths of their respective systems. As with the field, so with the mind—a summer's fallow may have its advantages, and the crop of sprightly tares turn out no mean preparation for an ample yield of weightier cereals.

Dr. Sibson proposed, and Dr. Radclyffe Hall seconded, a vote of thanks to the retiring President, which was passed unanimously, and it was decided that Dr. Charlton should be enrolled among the permanent Vice-Presidents of the Society.

The Hastings Medal for 1870, which had been awarded to Dr. J. M. Fothergill for an essay on "Digitalis, its Mode of Action and its Use," was then presented to that gentleman, amid general cheering.

The Report was next read, from which we extract the following paragraphs:—

"At the Annual Meeting in 1870, there were on the list 4251 members, of whom 65 have died, 94 resigned, and 106 have been removed for non-payment of subscriptions. 411 new members have been elected this year. There are now 4403 on the books.

"The joint Committee on State Medicine will present a report—a report which deals closely with recommendations of the Royal Sanitary Commission, and the principles that should regulate the future sanitary administration of the kingdom, subjects full of interest both to the medical profession and the public; and which will doubtless occupy a prominent place in the deliberations of the meeting.

"The Therapeutical Committee have been at work during the year; they have performed a large number of experiments, and collected much valuable matter, but are not yet prepared to report the result of their labours. Your Council regret that Professor Hughes Bennett will not, in consequence of ill-health, be able to attend the Annual Meeting."

The Council being fully convinced that the amount of Association work done at, and the large sums of money passing through, the Journal office, imperatively demand that the duties of Secretary of the Association, and the management of the office, so interwoven with each other, should be performed by the same officer, who shall be directly responsible to the Committee of Council, recommend that in future the General Secretary shall reside in London, so that, in addition to the duties now required of him, he shall give personal attention to, and be responsible for, the management of the financial and business department of the Journal office.

After some discussion the Report was adopted.

On Wednesday the Association met in the Town Hall, Devonport, when an address of congratulation and welcome was presented from the mayor and corporation of that borough.

It was agreed that Birmingham be the place of meeting in 1872, and that Alfred Baker, Esq., be the President elect.

Mr. Watkin Williams was appointed to act as General Secretary till the end of the year, and a Committee was appointed to define the duties of the General Secretary, and to take steps for the appointment of, on the next annual meeting.

Dr. George Johnson then delivered the Address in Medicine. He referred to the great interest which was excited when, about fourteen years ago, the late Sir John Forbes published his book on 'Nature and Art in the Treatment of Disease.' The author of that little volume, in clear and vigorous language, with pitiless logic, characteristic truthfulness, and fearless candour, pointed out the evils resulting from what he called the over-active perturbative treatment and the mischievous polypharmacy which were then prevalent. Sir John Forbes lamented that in his day a purely expectant treatment of disease was rarely practised, except under other colours and under other names; and he referred to the results of homœopathic treatment, which he looked upon as simply inert, in proof of the proposition that "the power of Nature to cure disease is infinitely greater than is generally believed by the great body of medical practitioners and by the public. So great, indeed, is this power," he goes on to remark, "and so universally operative, that it is a simple statement of facts to say, that of all diseases that are curable and cured, the vast majority are cured by Nature independently of art; and of the number of diseases that, according to our present mode of viewing things, may be fairly said to be curable by art, the far larger proportion may be justly set down as cured by Nature and art conjointly."

Since the publication of Sir John Forbes's book, and partly, no doubt, in consequence of that publication, our views as to disease and its treatment have undergone a very great change. A purely expectant treatment is now as common as then it was rare. It is now fashionable and orthodox to trust to the curative powers of Nature, and to doubt the therapeutic power of art. The pendulum has swung from one extreme to the other. At that time it was said, that according to the vulgar notion, the function of the physician consists in little else than the prescription or administration of drugs, and the function of the patient in little else than swallowing them." Now, on the contrary, that which was once said satirically, has come to be an almost accepted rule of practice; namely, that "the chief business of the physician is to amuse the patient while Nature performs the cure."

Now it is a very noteworthy fact that, simultaneously and side by side with this firm belief in the almost all-sufficiency of Nature and the impotence of art, there notoriously exists an extreme unwillingness to admit that any phenomena of disease can rightly be considered as having a conservative or curative tendency, so that to speak of pathological processes as curative efforts of Nature, "is a mode of looking at the phenomena of disease always suspiciously cross-examined at the present day."

But surely there is, *à priori*, good reason to believe that in the curative process of Nature there is an orderly method of procedure, of which, by a diligent search, we may gain some useful knowledge.

We are all too apt to forget that disease is a natural, although an abnormal condition of the body; that pathology is, in fact, a department of physiology, and that the phenomena of disease result from the action of the normal structures and forces only modified by morbid conditions.

Dr. Johnson then instanced some very obvious and well-known phenomena as examples of morbid processes having a conservative or curative tendency, and expressed an opinion that, as practitioners of medicine, they had something more to do than to watch the phenomena of disease as passive spectators, and that in their endeavour to prevent, to mitigate, and to cure disease, they had a better guide than mere empiricism.

He concluded by saying, I have suggested that a belief in the power of Nature to cure all curable diseases is inconsistent with a disbelief in the existence of morbid processes having a conservative or curative tendency. I have indicated various pathological phenomena the conservative tendency of which appears to me indisputable; and I have endeavoured to show that, by a careful study of the functional and structural changes which result from disease, we may obtain most valuable indications for treatment,—learning thereby both to do that which may aid Nature and to avoid such means as may tend to thwart and hinder the natural curative processes.

Again, I have intimated that it is difficult, and, as it seems to me, impossible, to reconcile a disbelief in the elimination of morbid poisons with a belief in the spread of disease by contagion. Confirmatory evidence as to the elimination of morbid poisons is afforded by the disastrous results of repressive methods of treatment. To take all possible precautions to exclude the cholera-poison from the system, and then, when once it has gained an entrance, to endeavour to retain it there by opiates and astringents, are practical modes of procedure utterly inconsistent with each other; unless, indeed, the object of this repressive treatment be to sacrifice the individual for the public good—to prevent the patient, at the peril of his own life, from scattering the seeds of disease and death among the community.

I believe that the success of our attempts to cure and to prevent disease depends mainly upon an exact diagnosis and discrimination of the various forms and shades and stages of disease; upon a correct interpretation of pathological processes and symptoms; a careful avoidance of erroneous and misleading theories; and, lastly, upon a prompt recognition of the exciting causes of disease, some of which may be avoided, some removed, while the influence of others may be in a greater or less degree counteracted by the timely employment of suitable means.

Parliamentary and Law Proceedings.

HOUSE OF COMMONS.

Petroleum Bill.—The Petroleum Bill was read a second time on Thursday, August 10; passed through committee on Tuesday, August 15; and was read a third time and passed on Wednesday, August 16.

Poisoning by Carbonic Oxide.

On Saturday, August 29, a labourer, named John Howie, employed in the iron foundry of Messrs. Law and Co., Glasgow, was found dead under circumstances that have led to the conclusion that he was poisoned by carbonic oxide. It is supposed that on Friday, Howie, to prevent interruption while at dinner, had shut himself up in a spare room, and was not missed until the following morning. He was then found dead. His face, the front of the left side of his breast, shoulder, and the front of the upper part of his left arm, were red, and appeared to have been scorched, and the cuticle was peeling off. There were no other marks on the body. In the apartment in which the body was found there was a very strong, rapidly-sickening smell, which appeared to be caused by some chemical gas. The medical man called in was of opinion that the scorched appearance upon the face, shoulder, and arm might have been caused by the chemical action of such gas, or by heat from a fire.

This suspicion of air-poisoning was strengthened by the fact that on the previous day several of the *employés* of the Messrs. Law were seized with retching and vomiting, from which they recovered under medical treatment. In the afternoon an investigation was entered upon by Dr. T. E. Thorpe, Professor of Chemistry in Anderson's University. The works of the Messrs. Law are entered by a gateway carried under the front building. On one side of this entrance, and inside the gateway, is the office, in which several of the *employés* were seized with illness on Friday. Adjoining this office is the little room in which Howie was found. Beyond the office, and separated from it by a brick wall, is a large smith's shop, also connected with the works. In this smithy some of the men working near the dividing wall complained of the prevailing sickness, while others who were further removed from the office appeared to escape. Passing through the entrance gateway the centre of the works is reached, a considerable unroofed area, surrounding which are several buildings, in which the various departments of the works are carried on. One of these is a small erection containing a blasting apparatus, which, by means of earthenware pipes carried underground, acts upon a furnace at the further end of the yard. Standing nearly midway between the blast and the furnace is a heating-room, in which articles are prepared for the "dressers" by being subjected to an intense heat, and while in this state are placed on the floor to cool. The heat is communicated to the floor, which is of iron, and at times it is said to have become red-hot. The greater portion of the site on which the works are erected is forced earth, the product of what is known as a "free coup," and contains a large quantity of cinders. It is therefore of an open, porous nature, and peculiarly liable to the action of heat.

In the room in which the body of Howie was found, nothing particular was at first observed. In the course of previous inquiry, the window-panes had been broken and the door thrown open, in order to promote the escape of foul air from the apartment. To restore the room as far as possible to its former condition, the door was closed, the place of the broken window-panes was supplied with straw and the blast was set in operation. A short time having elapsed, Dr. Thorpe entered the room, and in two or three minutes was seized with headache and a feeling of giddiness and oppression about the head. The smell was of a peculiar kind. It was apparent, therefore, that the poisonous influence, whatever it might be, was specially present in this room. A pigeon was thrown into the room and the door shut, and in forty-five seconds it was found to be dead. A dog was next shut up. In about half a minute the animal began to moan—at first loudly and then less audibly—and in two minutes and a quarter it also was found to have succumbed. Pushing his inquiries further, Dr. Thorpe caused the soil in the neighbourhood of the heating-room to be upturned, and here it was found that a layer of earth, principally cinders, had ignited and gave out a whitish smoke. It also appeared that the underground pipes, through which the blast operated upon the furnace, were cracked by the heat, so that when the blast was set going the leakage released the gases generated in the earth, and these, the combustion being imperfect, would be mainly carbonic oxide. Near the source of escape the main line of pipes from the blast is intersected by a forked line of piping, which is carried back to the smith's shop, terminating under the brick wall formerly described as separating the office from the smithy. At this point some of the mortar between the bricks was found to have been dislodged, and in this way the gas which had been conveyed through the fork-line of pipes was distributed in the office and the little room in which Howie was found dead.

After the experiment with the dog had been made as already stated, the door of the room was opened and the poisonous gas allowed to escape, the operation of the blast also being suspended. The room was again shut up. A dog was imprisoned for the night, in the morning he was found unhurt. The conditions of this experiment were exactly the same as before, with the significant exception that the blast was not going.

The Alleged Poisoning by Arsenic at Cambridge.

This case has, after a prolonged investigation, resulted in the discharge of the prisoner. At the last examination Mr. Edmund Foster, the solicitor for the prosecution, said that he had communicated with Professor Letheby, and requested him to make an analysis, and asking what portions of the body he would require. In consequence of Dr. Letheby's reply, there were sent to him the pudding, the vomit, and various parts of the body which have been mentioned. Dr. Letheby afterwards made a report, in which he said that he was unable to find poison in any of the matters submitted to him.

Professor Liveing said that the result of his second analysis being inconsistent with that of the first, and also inconsistent with the opinion of another experienced chemist, and the whole quantity of arsenic found being so exceedingly minute, he could hardly avoid the conclusion that it was accidentally present, even though he could not point out how it might probably have arrived there. This opinion he gave as the result of his experience. He ought also to state that the whole quantity found might be taken by any one with perfect impunity.

The Bench, after consulting a short time, decided to discharge the prisoner, but gave her to understand that she would be re-arrested if any other evidence were forthcoming.

Poisoning by Carbolic Acid.

A case of poisoning occurred at Newcastle, on Friday, the 11th inst. A child, named Anthony Grady, three years and two months old, son of a labourer, about two o'clock asked his mother for some bread and sugar, which she gave to him. The child then went upstairs into the house of a neighbour, where there had been a case of smallpox, and found lying behind the door a bottle of carbolic acid, which had been sent for disinfecting purposes. A neighbour living next-door heard the child shouting "Biddy, Biddy, my mouth," and immediately ran to it, and found it suffering from the effects of the poison. About half-past three o'clock it was taken to Dr. Gibbs's, but at that time it was sinking very fast. All the means likely to save the child's life were used, but without effect, and it died in great agony."—*Standard.*

The following journals have been received:—The 'British Medical Journal,' Aug. 12; the 'Medical Times and Gazette,' Aug. 12; the 'Lancet,' Aug. 12; the 'Medical Press and Circular,' Aug. 11; 'Nature,' Aug. 10; the 'Chemical News,' Aug. 12; 'Gardeners' Chronicle,' Aug. 12; the 'Journal of the Society of Arts,' Aug. 12; the 'Grocer,' Aug. 12; 'Produce Markets Review,' Aug. 12; the 'English Mechanic,' Aug. 11; the 'Chemist and Druggist,' Aug. 15; the 'American Journal of Pharmacy' for August; the 'New York Druggist's Circular' for August; the 'Dublin Quarterly Journal of Medical Science' for August.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

The Pharmacy Bill.

Sir,—I have read with much interest the numerous letters which have appeared in your journal relative to the Amended Pharmacy Act, and can only express my surprise at some of your correspondents, who seem to treat the matter with the utmost contempt, ignoring Government representatives who have received them as gentlemen, and, with regard to the Bill, have rather acted than said, "Come, and let us reason together." Reason and common sense seem to me to have been thrown entirely on one side by the so-called Chemists' Defence Association,—so much so, indeed, that I think defence should rather read defiance; for some of these gentlemen appear as though they would fly directly in the face of those who, but a few years since, placed pharmaceutists essentially on their legs, instead of quietly reflecting and asking themselves the questions, What is it Government proposes to do? and, What are the objections to such propositions?

Perhaps, Sir, you will pardon my trespassing on your space with a reply to these two questions.

What is it that Government proposes? In the first place, I may say it is no new thing, for the Pharmacy Act of 1868 required, and no one then discussed the matter, that compulsory regulations should be provided by the then constituted governing body—the Pharmaceutical Society of Great Britain. This Society, up to the present date, has failed to fulfil its contract; and, naturally enough, has been called over the coals. Where was the honesty of the accepted contract, unless those who accepted it fully intended complying with, and carrying out to the letter, its requirements? And now we find Government is determined (although the Bill is quietly put on the shelf this session, until those who now denounce it as monstrous and inconsistent with liberty have come to reason) to bring in their own Bill, to make complete that Act which in honesty they agreed the Pharmaceutical Society should do; and the old saying comes true again with regard to master and man, "If you want a thing done properly, do it yourself."

What are the objections to these propositions, for compulsory regulations?

With regard to them, Mr. Sandford has plainly told us, and others have repeated the same, that when Mr. Forster was approached in a courteous common-sense manner, he appeared most willing, as a gentleman, to discuss in a proper spirit the merits of the Bill, and to withdraw such objections as he found necessary for the interests of the pharmaceutists as a body; but this mode of procedure was at once thrown on one side by an infusion of bad blood, demanding the strongest opposion to the Bill itself in a manner, I consider, quite inconsistent with the character of Englishmen,—and thus ignoring the very contract which granted to the Pharmaceutical Society its present elevated position, and which contract required of those accepting it that compulsory poison regulations should be part and parcel of the same bargain.

I think, Sir, we are unfair and unjust in such hasty action, and I most cordially agree with Mr. Sandford, and admire his manly, honourable, straightforward action; for, at the bottom of it all, I believe he has the real welfare of the Pharmaceutical Society at heart.

Let us not harbour in our Society hard and harsh words,—"treason" and "treachery,"—but rather act in unison, conceding and accepting for our mutual good, and the welfare and advancement of pharmacy. Then, I think, we shall see some of our good old friends, whose names as correspondents and workers, to me, have been conspicuously prominent of late by their absence, working again amongst us.

Arthur Wm. Postans.

35, Baker Street, W.

Sir,—In candour I am bound to admit Mr. Giles's criticism of my letter is so far correct that there is no mention of inspection in the Pharmacy Act Amendment Bill. Whether the passing of the Act would lead to such a degradation, is a question which chemists should seriously consider.

As to the fetters the proposed Act would really impose, when so gentlemanly an advocate as Mr. Giles says "they won't hurt you," no wonder his happy confidence is somewhat contagious. The Act, some may think, would not be enforced; it has no teeth, and therefore even Mr. Simon could not make it bite.

But surely it were the part of wisdom to look into this before, rather than after, its infliction; to submit it, at least, to a previous qualitative analysis. Does it contain the elements of informations? Has it a trace of penalties? Is it at all forwarded by summary convictions? If so, whether through official inspection or otherwise, it is not a thing to be assumed with a "light heart."

The time will probably come when the amenities of the Privy Council Office will be regarded as dangers escaped; when the attempt to encumber chemists with restrictions, while the necessity for them was fast vanishing, will be seen as a monstrous injustice; and when even Mr. Giles will discover that "loyalty to pharmacy" is best observed neither by inviting legislative interference, nor by willing submission to compulsory regulations.

Glastonbury, August 14th, 1871. T. Mayhew.

Sir,—There is a difference of opinion as to whether the Pharmacy Act of 1868 required as a matter of necessity, or only provided as a matter of possibility, that further regulations for the dispensing and storage of poisons would be framed; but if it be necessary to consider the amendment of the Bill, that circumstance certainly affords the opportunity of reconsidering whether or not it would be advantageous to enact regulations such as it is said were contemplated, the real problem, both for ourselves and for Parliament, being the greatest good to the greatest number.

Seeing that the signers of Mr. Sandford's circular in favour of the "Bill to amend" have sought the aid of Parliament to impose upon themselves and their neighbours a code of additional regulations which they say are free from objections, and would be highly conducive to public safety, it is reasonable that we who have taken an opposite view of the practical value of the proposed measure should give a candid consideration to what they may be able to describe as their experience of the working of the proposed code.

As far as my experience has gone, I have not been favourably impressed with the regulations; and though I would at any time have read with interest an account of the experience of my neighbours, I have as yet only met with general expressions of approbation, without such particulars as would enable me to judge of the way in which the details of the scheme are carried out.

The circular states that the regulations were taken from the systems practised in the best-regulated establishments, and I think we may legitimately conclude that the signers mean their own establishments, which we willingly admit are many of them eminently well conducted, and under most favourable circumstances for a satisfactory trial of the proposed plan. As there is a very large number—I believe I might say a very large majority—of the trade who do not agree with the signers of the circular, we may reasonably request some of the latter gentlemen—say the first six on the list—to give a detailed account of how the regulations work in one or two of the points which have been most objected to.

I take the first six signatures on the list,—

Allen and Hanburys,
J. B. Barnes,
John Bell and Co.,
W. L. Bird,
Blake, Sandford and Blake,
Bolton and Co.,

and respectfully invite them to communicate to the Journal, or to myself privately, for public good, details of the precautions they use in the storage of each of the following poisons, and also—for comparison—the precautions, if any, observed in the storage of the subjoined list of drugs which are not poisons. As I do not wish to trespass unreasonably on their time, I limit my list of poisons to the official preparations of one Natural Order, and my list of non-poisonous drugs to a small number, which may be instructive by comparison; and I should feel it perfectly satisfactory if the particulars were furnished by the chief assistant or manager in each establishment:—

Poisons.

Decoct. Papaveris.
Extractum Papaveris.
Syrupus Papaveris.
Opium.
Confectio Opii.
Emplastrum Opii.
Extractum Opii.
,, ,, Liquidum.
Linimentum Opii.
Pilula Ipecacuanhæ cum Scilla.
,, Plumbi cum Opio.
,, Saponis Composita.
Pulvis Cretæ Aromat. cum Opio.
Vinum Opii.
Suppositoria Plumbi Composita.
Morphiæ Acetas.
Liquor Morphiæ Acetatis.
Morphiæ Hydrochloras.
Liquor Morphiæ Hydrochl.
Suppositoria Morphiæ.
Trochisci Morphiæ.
,, Morphiæ et Ipecacuanhæ.

Drugs not Poisons.

Extractum Physostigmatis.
,, Nucis Vomicæ.
,, Stramonii.
Hydrargyri Sulphas.
,, Nitratis Acid. Liquor.
Ol. Crotonis.
Linimentum Iodi.
Acid. Carbolicum.

If, in response to this request, we should be favoured with the experience of these, or any other firms of noted standing, it would be most desirable to have the replies drawn up without intercommunication, as diversity or coincidence of experience would thus be most instructive, and would be likely to lead ultimately to greater unanimity.

11, *Grey Street, Newcastle, August 15th,* 1871. Barnard S. Proctor.

Sir,—We have heard a good deal lately about the education of pharmacists, and yet, on looking back a few months and reading the correspondence on the Poison Bill, we cannot but admit that that education has signally failed.

"Ingenuas didicisse fideliter artes,
Emollit mores, nec sinit esse feros."

Does it indeed? If Ovid had lived in our day he never would have written that. A body of presumably educated men treat one another with the barest courtesy, and often with something far short of that, and why? because their opponents hold different opinions from themselves. Mr. Sandford is a "traitor," because he zealously works in aid of a cause which he believes best for the public weal. The Defence Association is a body of "misguided men" and "factious agitators," because they differ from Mr. Balkwill, and so on.

How very generous, how very liberal-minded we are getting with our education! I think if our pharmacists, one and all, had shown a little more respect for their opponents' opinions, the poison question would now be settled. As it is, I fear we shall have the same painful ordeal to undergo in the next session of Parliament.

Preston. An Apprentice.

Chinese Materia Medica.

Sir,—Adverting to Dr. Porter Smith's book on this subject, which received notice in your pages some little time since, may I be permitted to point out two or three errors, and—as I believe—correct them. I know how difficult it is in a foreign country, removed from books and civilized men, to produce a moderately good book on a scientific subject, but that is no reason why the imperfections of such work should be passed over. In the interest of science, it appears to me to be the duty of those who detect mistakes to apply themselves to their correction.

The remarks to which I desire to direct attention occur on page 140, and are to the following effect:—"*Lycoperdon giganticum* (Ma-peh). Species of Puffball and Truffle are met with in Central China. The brown broken, globular masses of this species of *Lycoperdon*, said to vary from the size of a Chinese bushel to that of a peck, are met with in the drug shops here in a dried and decayed state. They are full of the reddish-brown, powdery spores, which are employed as a dusting powder after careful sifting. They are given in affections of the gullet, larynx (aphonia), lungs, and in hæmorrhages. Sugar and honey are taken with this powder." Specimens of Ma-peh have somewhat the resemblance, at first sight, of a *Lycoperdon* or *Scleroderma;* indeed, the spores more closely resemble those of *Scleroderma geaster* than those of *Lycoperdon giganteum* (not *giganticum* as printed). The microscope would prove in an instant that the spores of the Ma-peh are not those of *Lycoperdon giganteum,* since they are echinulate and four times the size; again, the colour is so much brighter and more ferruginous; but the most conclusive evidence lies in the structure of the fragments themselves, in which will be found the remarkable inner peridia characteristic of the genus *Polysaccum.* In fact, the Ma-peh, or, at least, all that I have seen, is a true species of *Polysaccum.* The spores are just like those of *P. crassipes,* except that, perhaps, they are a trifle darker. Because, when ripe, this fungus, in common with its allies, becomes broken up and dusty, that is no reason for calling it "decayed;" the "decayed state" is manifestly an error.

The next article is a mystery. It is thus described:—"*Lycoperdon squalmatum* [*sic*] (Kiuen-peh). The whole plant of this fungus, with its mass of brown fibrous roots and green branching curved, compressed fronds, with furrowed, acuminate, hygrometric scales, is likened by the Chinese to a fir. It grows to the height of some six or eight inches on stones, and is collected for medicinal use at Ningpo, although it is met with all over China. A large trade is carried on in all sorts of drugs between Hankow and Ningpo, second only to that between Siang-tan and Hankow. It is given as an emmenagogue, cordial, deobstruent, and tussic remedy. When scorched or dried artificially, astringent properties are assigned to this harmless substance." Harmless it may be, but curious it must be, if it claims to be a fungus and a *Lycoperdon,* with green branched fronds, covered with hygrometric scales. The Chinese are a marvellous people, and few nations could compete with them in the production of a green *Lycoperdon* with scaly branched fronds. Is it possible that Mr. Porter Smith can have made the mistake of calling it a fungus, and referring it to the genus *Lycoperdon* instead of the *Lycopodiaceæ!* It might be so, only that the author distinctly call it a "fungus,', and it would be uncharitable to suppose that he could not distinguish at a glance a fungus from a Fern or a Lycopod.

As to the Chu-ling (p. 171), which happens to have much more in common with the Fuh-ling than "half the name," I must refer Mr. Smith to the third volume of the 'Journal of the Linnean Society' (Botany) for information.

M. C. Cooke.

Pharmacy in France during the War.

Sir,—It may not be generally known that the provincial pharmacists of France suffered much loss and inconvenience from the investment of Paris by the German armies. I allude to those living without the pale of the enemy's incursions; of the miseries endured by those gentlemen who found themselves in the actual presence of the dreaded foe, and among all the positive and immediate horrors of war, I am scarcely competent to speak. It is well known that, beyond the fact of Paris being the bureaucratic centre of France, the provinces depended on the capital for nearly all that tends to make life comfortable and luxurious. Paris, if not the source or seat of manufacture, was at least the chief *entrepôt* of all drugs, chemicals and pharmaceutical accessories; hence it is easy to divine the difficulty experienced by country pharmacists in renewing their exhausted supplies. I am able to speak personally of the occasional impossibility of procuring preparations such as the morphia alkaloids, pure carbolic acid, quinine and, most especially, chloral hydrate. This last was much prescribed in the locality (a town in the south of France) in which I passed the winter, and at times, in spite of much begging and borrowing from our *confrères* of Lyons, Marseilles, Bordeaux, and the neighbouring towns, our stock of it ran completely out. The little now and then obtainable cost from 3·50 francs to 5 francs per 30 grammes. It was quoted in England about this time at 11*s.* per lb. Towards the end of the season, however, we were fortunate enough to meet with a small parcel imported in an indirect manner from Berlin—of all places in the world!—of very excellent quantity.

Parisian specialities rapidly became scarce and very dear, their trade-value ruling higher than the ordinary price to the public. The more popular of these articles soon disappeared entirely from the market.

Some of the most current remedies of a French pharmacy being prepared in the form of syrups and *pâtes,* the very high price of refined sugar towards the end of the war augmenting their value was the subject of much complaint on the part of the poor peasants, to whom a few sous represent many hours of weary labour. It may be suggested that supplies might have been derived from Italy, Switzerland or even Spain; but these countries really depend almost as much upon Paris as France itself. England, of course, could have furnished her unfortunate neighbour to an unlimited extent, and probably did partially supply the north of France; but very little English produce found its way to the extreme south, owing in part to defective means of transport, and in part to the paucity of business relations between England and the locality in question.

Walter A. Powell.

The Weights of the British Pharmacopœia.

Sir,—Will you allow me, through the medium of the Journal, to point out a few of the disadvantages, and even dangers, of the present system of weights in the P. B.? For instance, in making one-fourth of the quantity of pilula saponis comp. many chemists would put 5 grains of opium too much, by reckoning 480 grains to the ounce instead of 437·5, and the same mistake would happen in making small quantities of many of the P. B. preparations. It is a constant source of annoyance to the pharmacist in making small quantities of preparations for immediate use to have to enter into a long calculation to arrive at the proper quantities of the ingredients.

I hope that when a new edition of the P. B. is contemplated the Pharmaceutical Society will use its influence, and endeavour to have the metric system used in it, which is as easy to learn as the alphabet; and I think that if the Society would petition Parliament, in the manner they did to throw out the Pharmacy Bill, for the adoption of the metric system, and not only chemists signed the petitions, but every one who was willing, it would be carried the next time it is brought before Parliament. Why should not candidates for the Preliminary Examination be required to possess a knowledge of the system instead of those for the Minor? they cannot be expected to succeed to any great degree in their after studies unless they possess a practical knowledge of it.

Gramme.

"*Galvanic.*"—A correspondent, under this signature, suggests that "an idea which might be carried out without much expense would be to have a galvanic battery to which all the bottles containing the most powerful poisons might be attached, so that when the dispenser had occasion to handle one he would receive a slight shock which could not fail at all times to attract his attention, if diverted from the subject in which he was engaged."

"*One of the Candidates.*"—We would recommend you to forward your complaint to the Council, with whom the decision in the matter rests.

"*Minor Exam.*"—Apply to the Secretary for a Synopsis of the Examinations.

G. R. C. will find the recipes asked for in Vol. I. pp. 477 and 496.

W. H. Wilson.—See a case reported Pharm. Journ. 3rd ser. Vol. I. p. 775.

"*Pharmacist.*"—In each of the first four lines of the copy of prescription sent, the quantity is the direct object of the transitive verb; in the fifth line the word "aquam" is the direct object. The M.D.'s view is therefore correct.

E. H.—The precipitation is caused by the chemical affinity of the oxide of lead for the colouring or extractive matter; such compounds are almost invariably insoluble, hence subacetate of lead will completely decolorize in nearly every case. Yes.

Communications, Letters, etc., have been received from Mr. R. O. Fitch, Mr. J. S. Schibild, Mr. J. M. Fairlie, Mr. G. Harvie, Mr. A. Metcalfe, Mr. R. Mumbray, Mr. A. Pickering, A. D., M. P. S., R. W., J. R. and Co., "Registered Chemist and Druggist," "Old Member," "Scotland's Right," "Theta," "A Glasgow Chemist."

A. P. S. and C. C. P. A. P. S. have failed to comply with the rule as to anonymous correspondents.

NIGELLA SEEDS OR BLACK CUMMIN.

BY DR. F. A. FLÜCKIGER,

Professor in the University of Bern.

These seeds which had a place in the Bengal Pharmacopœia (1844), are included in the Pharmacopœia of India (1868) among the "non-officinal" articles. But as they are still of considerable importance in the East and are even in use in some parts of Europe, I have thought that a few particulars regarding the experiments I have made upon them may not be uninteresting to the readers of the PHARMACEUTICAL JOURNAL.

Name.—In pharmacy they have been termed *Semen Nigellæ*, s. *Melanthii*, s. *Cumini nigri*. In English the plant bears the name of *Nigella*, *Black Cummin*, *Gith*, or *Bishopswort;* in German the seeds are called *Schwarzkümmel* or *Nardensame;* in French *Cumin noir*, *Graine de Nigelle romaine*, or *Poivrette*. Most of the Indian names signify when translated *Black Cummin.*

Botanical Origin.—*Nigella sativa*, L. (*N. indica*, Roxb.), belongs to the Order *Ranunculaceæ* and is an annual herb, 8 to 12 inches high, with leaves cut into numerous, narrow, pinnate segments. The flowers are solitary, terminal, without an involucre; the petals blue and white, with greenish glands. The capsule is formed of 3 to 6 carpels, opening by the ventral suture. The plant grows on the Mediterranean coasts, in Egypt and Trans-Caucasia, whence it has spread to India. Boissier* regards the var. β *brachyloba*, occurring in Cilicia and Syria, as the original type of the plant in a wild state.

Nigella sativa is now widely distributed as a cornfield weed throughout temperate Europe and America, though not in Britain. In Germany it is cultivated to some extent near Erfurt.

History.—Nigella is thought by some to be the *kezach* of Isaiah (xxviii. 25), translated in the English Bible *fitches*.

Dioscorides described the plant clearly under the name of Μελάνθιον. Pliny called it *Git*, under which appellation it is found among the plants which Charlemagne ordered to be cultivated on the imperial farms of his dominions. This name however, was frequently applied in the middle ages to the Corn Cockle, *Agrostemma Githago*, L., which is indeed termed by Gerarde *Bastard Nigella*. In his time, nigella was commonly sown in gardens, the seeds being used medicinally in wine as a spicy stimulant, and also as a perfume, for he says "it serveth well among other sweets to put into sweet waters, bagges and odoriferous powders."

Nigella seeds had a place in the London Pharmacopœia as late as the edition of 1721. In the East, the seeds have been extensively used from the remotest times to the present day.

Description.—The seeds are about $\frac{1}{10}$th of an inch long, of an irregular compressed pyramidal form, 3- or 4-sided, with an oblique rounded base, whence sharp ridges proceed towards the blunt summit of the seed. The surface is black, rough, granular, and devoid of polish. The seeds have an aromatic taste, and, when crushed, considerable fragrance.†

Microscopical Structure.—The albumen consists of large polyhedral cells, and is covered by a thin brown tegmen. The testa presents two or three rows of more or less thick-walled cells; the inner being elongated in a direction parallel to the surface of the seed, the outer vaulted and a certain number of them, chiefly those forming the ridges, prominently conical. The whole testa is blackish or dark bluish. The embryo is situated near the apex of the seed.

The tissue of the albumen abounds in fat oil and in granular albuminous matters; it is not altered by a salt of iron.

Chemical Composition.—Reinsch in 1841 obtained from this seed 35·8 per cent. of fat oil, 0·8 per cent. of volatile oil, and only 0·6 per cent. of ash. He gave the name of *Nigellin* to a bitter extract resembling turpentine, yet soluble in water as well as in alcohol, though not in ether.

By submitting 25 lb. of fresh seed to distillation, I obtained a nearly colourless essential oil in even smaller quantity than *Reinsch*. It has a slight odour, somewhat resembling that of parsley oil, with a magnificent bluish fluorescence, as already remarked by Reinsch.

In a column 50 mm. long, this oil deviates the ray of polarized light 9·8° to the left. Its specific gravity is 0·8909. The chief part of it, when distilled with chloride of calcium in a current of dry carbonic acid, comes over at 493° (256° C.) In an elementary analysis* it yielded: carbon: 83·3, and hydrogen: 11·8 per cent., corresponding to the formula $2\ C_{10}H_{16} + H_2O$.

The residual portion was almost entirely devoid of deviating power; it yielded carbon: 87·89, and hydrogen: 11·72 per cent., after having been rectified by means of sodium. This part of the oil consequently belongs to the formula $C_{10}H_{16}$.

I extracted the fat oil, by means of boiling ether, from seed grown in Germany, previously finely powdered. The oil thus obtained which necessarily included some essential oil imparting to the other its fluorescence, amounted to 25·6 per cent. It is a fluid fat which does not congeal at + 5° (− 15° C.); it was found to consist chiefly of olein, besides which it yielded a considerable amount of a solid fatty acid, the crystals of which, after reiterated purification, melted at 131° (55° C.). The melting point did not rise by recrystallization, the acid being probably a mixture of palmitinic and myristic acids.

Nigella seeds, powdered and dried over sulphuric acid, yielded 3·3195† per cent. of nitrogen, answering to about 21½ per cent. of albuminous matter.

Uses.—It is stated in the Pharmacopœia of India, that nigella seeds are carminative, and they were formerly so regarded in Europe. In the East generally they are used as a condiment to food, and in Greece, Turkey and Egypt they are frequently strewed over the surface of bread and cakes in the same manner as anise or sesame. The fixed oil of the seeds is also expressed for use.

I have no recent statistics indicating the extent to which the seed is grown, but may state, on the authority of an official French document, that during the year 1854–55, 83 quarters, worth 2592 rupees, were exported from Madras to Ceylon.

* Flora Orientalis, i. 68.

† Those of the nearly allied *N. Damascena*, L. are rather more ovoid, less sharply ridged, less aromatic, and not pungent.

* Performed in my laboratory by Dr. Kraushaar.

† On an average of three experiments made in my laboratory.

HIMALAYA TEA.

BY T. ZOELLER.

The May number of the *Annalen der Chemie und Pharmacie* contains the result of an interesting investigation on Himalaya Tea, by Th. Zoeller, which is of considerable value.

The author begins by stating that the opinion that the different sorts of tea are derived from various species of the tea-plant had been refuted by Siebold, and more completely still by Fortune's inquiries. Black and green tea are both derived from *Thea sinensis*, and the many varieties of tea in the trade are not products of different plants, but merely results of differences in climate, soil, cultivation, and in the preparation of the leaves, but, above all, of age. Although the tea-plant itself is hardy enough to bear considerable fluctuations in temperature, still, the quality of the leaves greatly depends upon the soil, cultivation, and, as stated just now, upon the age, while their preparation has no effect upon the quality, but only alters the outward form. Zoeller had previously shown that with beech-leaves the composition of the ash constantly changes with the age or development in the leaves, inasmuch as the amount of potash and phosphoric acid gradually decreases with progressing age, while lime and silica constantly increase in quantity. Taking this observation as his basis, Zoeller concludes that if the quality of tea is in the inverse ratio to the age of the leaves, the analysis of the ashes of it must enable us to determine the age, and consequently the quality. A high percentage of potash and phosphoric acid with little lime would indicate a young tea, or a superior quality; while, on the other hand, much lime and little potash would be the characteristics of an inferior quality. The author succeeded in obtaining some samples of Himalaya tea, collected when very young, and the analysis quite bore out his anticipation. These leaves had been gathered very early, the lanceolate form was not quite developed, they were of a fine black colour, and produced with hot water the most delicate aroma.

The analysis gave 4·95 per cent. of water, and 5·63 per cent. of ashes, containing much potash and phosphoric acid, and little lime; boiling water extracted 36·26 per cent., of which 4·94 per cent. was theine. To separate the alkaloid, the cells of the leaves were completely broken up by maceration with concentrated sulphuric acid; the acid was then neutralized by moist hydrated oxide of lead, and the mass repeatedly extracted with alcohol; the alcoholic extract was treated with animal charcoal, and after filtration slowly evaporated, when most of the theine separated in shining silky needles.

Further evaporation did not yield any more crystals, because the sugar, formed by the action of sulphuric acid upon cellulose interfered, and made the solution too syrupy; the rest of the theine was therefore separated by ether. The alcoholic extract on standing over-night deposited crystals, which Liebig took for theobromine; although the minuteness of the quantity prevented exact determination, the observation is important, as the presence of theobromine in tea had not before been shown. The nitrogen in the tea leaves amounted to 5·38 per cent.

The complete analysis of the different constituents showed the following results, viz.:—

	Ash of tea leaves.	Ash of aqueous extract.	Ash of leaves after extraction.
Potash	39·22	55·15	7·34
Soda	0·65	0·68	0·69
Manganese	6·47	3·13	11·45
Lime	4·24	0·95	10·76
Oxide of Iron	4·38	1·73	9·53
Oxide of Manganese	1·03	0·43	1·97
Chlorine	0·87	0·57	traces
Phosphoric Acid	14·55	7·89	25·41
Sulphuric Acid	traces	traces	traces
Silica	4·35	2·92	7·57
Carbonic Acid, etc.	24·30	26·30	25·28
	100·00	100·00	100·00

Percentage of Nitrogen.	Air-dry leaves.	Dry extract.	Exhausted and dried leaves.
Nitrogen	5·38 p.c.	10·09 p.c.	3·48 p.c.
Ash	5·63 „	11·46 „	3·06 „

100 parts of ashes of the leaves are composed of 30·82 parts of ashes of the exhausted leaves, and 69·18 parts of ashes of the extract.

The results lead to the conclusion that Himalaya tea is quite equal to the best Chinese tea, but it must remain undecided whether the presence of theobromine is accidental, or constitutes a distinction; the results also bear out the experience of tea-planters, that the youngest leaves of the tea plant give the best quality.

In the determination of the age of the leaves by analysis of the ashes the amount of potash must always be compared with that of phosphoric acid and lime, because the older plants often show a high percentage of potash if grown on soil rich in potash salt, but the amount of lime and phosphoric acid invariably decreases according to the age.

Remarkable and characteristic of the ashes of tea is the large quantity of iron and manganese. The effect of iron in the infusion of tea upon the vital functions has been noticed by Liebig in his 'Chemical Letters,' and the importance of iron in vegetal life is well known, whereas that of manganese has not yet been ascertained.

In making infusions of various samples, they show a difference, inasmuch as the best tea was most readily exhausted. The component parts of the ashes are dissolved in different proportions; chlorine almost entirely, potash very considerably, lime, magnesia and phosphoric acid but slightly. The different solubility affords a ready means to distinguish exhausted leaves from not exhausted ones; and this may be of practical importance, as exhausted tea is often made up and brought again into the trade. The ashes of exhausted leaves contain but little potash, but much of the above-named insoluble substances.

In reference to the action of tea upon the human system, the author again points to the richness in potash, the importance of which in nutrition has been demonstrated by Kemmerich's experiments. But as the infusion of tea contains but little phosphoric acid, the alkali is enabled to convert the acid phosphates of our food into less acid ones, *i.e.* into those which act as solvents of insoluble albumen, and which form part of the normal conditions of blood.

Hot water dissolves 3·56 per cent. of nitrogen; tea contains 4·94 per cent. of theine, equal to 1·73 per cent. of nitrogen; the difference in nitrogen, namely 2·14 per cent. is, according to Peligot, part of caseine, and corresponds to 13·7 per cent. of caseine, a quantity sufficiently large to play an important part in the process of nutrition.

Chapters for Students.

CHEMICAL NOTES TO THE PHARMACOPŒIA.

BY WILLIAM A. TILDEN, D.SC. LOND.

DEMONSTRATOR OF PRACTICAL CHEMISTRY TO THE PHARMACEUTICAL SOCIETY.

LIQUOR SODÆ CHLORATÆ.

A solution of chloride, hypochlorite, and bicarbonate of sodium, obtained by passing chlorine gas into a cold solution of carbonate of soda.

$$Na_2CO_3 + Cl_2 + H_2O + Na_2CO_3$$
$$= NaCl + NaClO + 2\,(NaHCO_3).$$

Properties and reactions similar to those of calx chlorata.

LIQUOR ZINCI CHLORIDI.—Granulated zinc is dissolved in hydrochloric acid, and the iron and lead, which are usually present, removed by addition of chlorine water, and digestion of the solution upon excess of carbonate of zinc. The foreign metals are in this way thrown out of solution as hydrated oxides:—

$$2\,(FeCl_2).Cl_2 + 3\,ZnO.CO_2 + xH_2O$$
$$= Fe_2O_3xH_2O + 3\,ZnCl_2 + 3\,CO_2,$$

and

$$PbCl_2.Cl_2 + 2\,ZnOCO_2$$
$$= PbO_2 + 2\,ZnCl_2 + 2\,CO_2.$$

After filtration the liquid is evaporated to the proper bulk.

The solution contains 175 grains of zinc, or 366 grains of chloride of zinc, in a fluid ounce.

LITHIÆ CARBONAS.—The minerals from which lithium is obtained, are silicates of aluminium and one or several of the alkali metals, part of the sodium or potassium being replaced by a chemically equivalent quantity of lithium. One of the best methods of treating these minerals consists in heating the finely powdered material with quicklime and a little chloride of calcium. The alkali is thus rendered soluble in the form of chloride, and can easily be converted into any compound that may be required.

[§ In white powder or in minute crystalline grains, alkaline in reaction, soluble in 100 parts of cold water, insoluble in alcohol. It dissolves with effervescence in hydrochloric acid; and the solution evaporated to dryness leaves a residue of chloride of lithium, which communicates a red colour to the flame of a spirit-lamp, and, redissolved in water, yields a precipitate with phosphate of soda.] Carbonate of lithia thus differs from the potassium or sodium carbonate in being but slightly soluble in water; it is also partially decomposed by long ignition, becoming converted into oxide.

Lithium salts are also distinguished from those of potassium and sodium by the sparing solubility of the phosphate and by the easy solubility of the platino-chloride.

LITHIÆ CITRAS.—Citric acid neutralized by the addition of carbonate of lithia and the resulting salt dried. A white deliquescent salt, blackening when heated, and when calcined with free exposure to air leaving a white residue of carbonate. 20 grains thus incinerated leave 10·57 grains.

MAGNESIA.—Carbonate of magnesia is heated to redness, till a portion taken from the middle of the crucible and allowed to cool, no longer effervesces with a dilute acid:—

$$(MgCO_3)_3Mg(HO)_2 4H_2O = 382, \text{ leaves}$$
$$4MgO = 160.$$

4 ounces, therefore, leave 1·67 or nearly $1\frac{3}{4}$ ounces.

[§ Dissolved in nitric acid and neutralized with a mixture of ammonia and chloride of ammonium, it does not give any precipitate with oxalate of ammonia or chloride of barium.]

The absence of lime and sulphate of magnesium or sodium is thus indicated.

MAGNESIA LEVIS.—[§ A bulky white powder, differing from the preceding preparation only in its greater levity, the volumes corresponding to the same weight being to each other in the ratio of three and a half to one.]

MAGNESIÆ CARBONAS.—Boiling solutions of sulphate of magnesia and carbonate of soda are mixed and evaporated to dryness. The residue, after thorough washing with boiling water to remove sulphate and excess of carbonate of sodium, is the salt required:—

$$\left.\begin{matrix} 3\,MgSO_4 + 3\,Na_2CO_3 \\ MgSO_4 + Na_2CO_3 + 5\,H_2O \end{matrix}\right\}$$
$$= \left\{\begin{matrix} 3\,MgCO_3 & 3\,Na_2SO_4 \\ MgO.5\,H_2O & Na_2SO_4 + CO_2. \end{matrix}\right.$$

The official carbonate is, therefore, not a simple carbonate, but a hydrate carbonate. A similar constitution belongs to all the precipitated carbonates, except those of barium, strontium and calcium.

A normal carbonate containing 3 mols. of water of crystallization, $MgCO_3.3\,H_2O$ is deposited in crystals by exposure of liq. mag. carb. to the air.

The only probable impurities are calcic carbonate and sulphate of sodium or basic magnesium sulphate. These are easily detected by dissolving in hydrochloric acid and then adding excess of ammonia and some oxalate for the first, or chloride of barium for the second.

MAGNESIÆ CARBONAS LEVIS.—Both this and the heavy carbonate possess the same composition and are partly crystalline.

THE ETYMOLOGY OF THE WORD OPODELDOC.

BY J. BORLAND.

A short time ago, as I was perusing some of the older volumes of the PHARMACEUTICAL JOURNAL, my attention was arrested by a reply which appears in notices to correspondents, Vol. VII. page 248, 1865.

The editor who then was there states, "We are unable to give the derivation of the term Opodeldoc."

Now, although I have read the Journal for many years, and always with that amount of careful attention which it merits, as the representative organ of pharmaceutical learning in all its phases, I had not previously observed this remark; and when I read it I felt a little uneasy and humiliated at the admission, and said to myself, by way of excuse,—probably, after all, our editor's philological learning has not been commensurate with his pharmaceutical; or, what is more likely, he has considered philology to be incompatible with pharmacy, and therefore needed not trouble himself in finding a positive answer to the inquiry made of him.

Not able to give us the derivation of such a commonplace household word as Opodeldoc! This I thought was *infra dig.*, words which, with a little vain-glory, I translated "not a very deep dig." I resolved, therefore, to take the task in hand, and dig for myself; and, as I had been able to satisfy my mind regarding the root and branches of such obscure pharmaceutical terms as "Tinker o'Falairy," "Glory o'Lyme," "Jessie Wit's Bark," "Ascetic-as-sid," and many others of a similar character, I thought there would be no difficulty in finding some clue to the parentage of Opodeldoc. I set about, therefore, consulting all the lexicons, dictionaries and works of reference that I could find, exultingly thinking that I would be able to solve the difficulty, and perhaps appear in print with a full and particular account of the birth and introduction to society of this apparently puzzling word. After much research, however, and the consultation of numerous works from which aid might fully be expected, I had to *knuckle in*, and, like the editor, acknowledge my want of success. I reconciled myself, it is true, to my sour grapes by finding the following terse remarks in Blancard's 'Physical Dictionary,' 9th ed., 1726, under the word "Opodeldoc'; "'Tis a fictitious name, having no real signification."

Having failed in the antique I tried the modern, but only to meet with similar want of success. Pereira was silent on the subject, Neligan was equally mute, and Christison did not even honour the word with *ink-shed*, as, so far as I can find, it is not once mentioned in his 'Dispensatory.'

I had learned, however, in my research that the word was employed by Mindererus, Paracelsus and other mediæval writers,—men who flourished at a period when the study of our ancient classics was considered to be of little use unless it could be made subservient to the introduction and employment of new and pedantic terms; and notwithstanding what Blancard says, I had come to the conclusion not to give any reception to the dogma of the spontaneous generation of words; that is, without assigning to them some primitive signification which might be ascertained if we could only brush away from them the rubbish with which time and change had obscured them.

As the speediest method of cutting the knot, I agreed, therefore, to avail myself of the scientific use of the imagination (which many have done before me in similar straits) and find roots for myself, taking similarity of sound as the basis of my operations; a course of action which, I know, is sometimes honoured with the remark, "As the fool thinks so the bell clinks."

I venture, therefore to suggest as the roots of this word Opodeldoc, *ὀπός*, juice, and *θέλγω*, I soothe or charm; Latin, *mulceo*. Syncopating the *s*, the word becomes *ὀποθέλγω*, and employing the adjective form we have *ὀποθελκτικός*, meaning the soothing juice or balsam. The syncopation of the final letter of the word *ὀπός* is found in several compound Greek words, such as *ὀπο-βάλσαμον, ὀπο-κάλπασον, ὀπο-κιννάμωμον, ὀπο-πάναξ* and others, and it would very naturally take place in the case of the word *ὀπο-θέλγω*, and besides, the mutation of the rough lingual *θ* into the softer medial *δ* is, though somewhat rare, not an unknown occurrence, especially in Æolic Greek; and though this be not a purely classical word, its compounders may possibly have fashioned it according to classic laws. Were we, then, to adopt this latter change, the word would become, using Roman letters, *opodelgo*, and conventionality or euphemism might lead to *opodeldo* or *opodeldoc*. Metamorphoses far more striking than this are to be met with in our present pharmaceutical nomenclature. We have liquorice from *glycyrrhiza*, fennel from *fœniculum*, chamomile from *chamæmelon* (the apple on the ground) and so on, and in a work recently published, Prior's 'Names of British Plants,' second edition, illustrations of the most curious kind are to be met with in almost every page.

These few remarks regarding the etymology of this word will, I hope, be considered as nothing more than suggestive; but if some of our London brethren, who have the resources of the British Museum library at their command and many other antiquarian stores, would only devote a little time and research to the subject, we might be enabled to remove its etymology from the domain of supposition and doubt to the region of fact and certainty, and I hope that very soen some one will do so and favour us with the result.

EXPERIMENTS WITH CARBOLIC ACID.

BY ANGUS MACKINTOSH, M.D., CALLINGTON.

In the interest of science, as bearing specially on the effects of carbolic acid on organic substances, I desire to record a few experiments, with their results, which I carefully performed with carbolic acid in November last, with the view of proving further to my own satisfaction certain chemical and physiological changes that I have observed in treating ulcers and severe surgical injuries with the acid. The results at which I arrived were published last year; and, in consequence, Messrs. F. C. Calvert and Co., the well-known chemists of Manchester, kindly forwarded to me several samples of the different preparations made by them, to be tried in smallpox, etc. I have now tested them in many cases of smallpox with almost unparalleled success, and also in various surgical operations; and, in justice to Messrs. Calvert and Co., must say that I consider their preparations immensely superior to any other of the acid yet given to the profession.

Having had reason for years to question the accuracy and correctness of the germ-theory of disease, and of the *modus operandi* of the antiseptic system of treatment, so ably brought before the profession by my respected teacher, Professor Lister, I last year called the attention of the profession to the fact that the beneficial effects of carbolic acid on wounds, etc. were not to be attributed solely to the destruction of atmospheric germs, but mainly, if not completely, to the chemical and stimulating effects of it on the constituents of the blood and surrounding parts. The following experiments confirm the opinion then expressed:—

CLASS I. *Experiment* i.—On November 8th, 1870, I mixed a quarter of a pound of bullock's blood (fresh) with two ounces of F. C. Calvert and Co.'s carbolic acid No. 5 (proportion, 10 of water to 1 acid), and covered the whole so as to admit no air. The temperature was 50 deg. *Result*, July 10th, 1871: No signs of putrefaction.

Experiment ii.—On November 8th, 1870, I mixed a quarter of a pound of bullock's blood (fresh) with two ounces of Calvert's carbolic acid No. 5 (proportion, 10 of water to 1 acid), and left the whole uncovered and exposed to the air. The vessels used in this and the previous experiments were placed side by side in the same apartment. *Result*, July 10th, 1871: Not the slightest signs of or tendency to putrefaction.

Experiment iii.—On November 9th, 1870, I weighed two ounces of lean fresh beef, and placed it in a pot with two ounces of carbolic acid (Calvert's No. 5, 10 water to 1 acid), and covered the contents completely from the atmosphere. *Result*, July 12th, 1871: The meat was perfectly free from putrefaction.

Experiment iv.—On November 9th, 1870, I weighed two ounces of lean fresh beef, and placed it in a pot with two ounces of carbolic acid (Calvert's No. 5, 10 water to 1 acid), and left the contents exposed to the air in the same apartment with Nos. 1, 2, and 3. *Result*, July 10th, 1871: There was no offensive odour nor putrefaction.

CLASS II. *Experiment* v.—In January, 1871, I excised from a man's left arm a non-malignant tumour weighing a pound and a half, and dressed the wound with thin muslin and Calvert's carbolic acid No. 5 (proportion, 30 of water to 1 of acid). The acid solution was dropped freely over the muslin many times during the day. The wound healed without suppuration or putrefaction.

Experiment vi.—I amputated an old man's middle finger in April, 1871, and dressed it in the same way as No. 5, with thin muslin, dropping the acid solution freely over the muslin several times throughout the day. The result was a perfect cicatrix, without any appearance of pus, suppuration or putrefaction.

Experiment vii.—A miner had both arms and face burnt in consequence of an explosion whilst blasting. The face was treated with linseed-oil and linseed-meal poultices, and afterwards with oxide of zinc ointment. A small quantity of pus could be detected. The arms were treated with carbolic acid and linseed-oil, 1 to 20. The muslin (the only covering) was always kept wet with the oil and acid. The result was a complete cure, without any pus or putrefaction.

These experiments, in combination with those which I published last year, have completely convinced me that the detailed plan of dressing wounds recommended by Professor Lister is absolutely unnecessary for the object of healing wounds by the first intention or without the formation of pus; and that the germ-theory of disease is, correctly speaking, an error.

In the first class of these experiments, I treated the blood and beef with exactly the same quantity of the acid solution, in the same proportion; and sealed one so as to exclude the contents completely from the atmosphere, and left the other exposed to the atmosphere. Under these opposite conditions, both, in the course of eight months, presented almost the same appearance, and no appreciable distinction could be recognized between their odours. There were no marks or signs of putrefaction in either.

The second class of experiments also gave the same result, and shows that only careful attention and regular application are required to produce always similar effects. I used the muslin cloth so as to allow a free current of air to all parts of the wounds. I firmly believe that the real difference in healing with or without suppuration is chiefly, if not altogether, owing to regularity in the application; and that the beneficial effects of the acid are to be principally attributed to its chemical and stimulating influence on the constituents of the blood and other parts concerned.—*British Medical Journal.*

THE ANTAGONISM BETWEEN THE ACTIONS OF PHYSOSTIGMA AND ATROPIA.*

In a Preliminary Note read before the Royal Society of Edinburgh on the 31st of May, 1869, a number of experiments were described, which proved that the lethal action of certain doses of physostigma can be prevented by the administration of atropia.† Further, it was pointed out, that antagonism between any two substances, in the sense of the lethal action of the one being preventible by the physiological action of the other, had not previously been shown to exist by any certain and satisfactory evidence. In the various instances where experiment seemed to indicate the existence of such an antagonism, sufficient proof was not given that the dose of the substance whose action appeared to be antagonized was certainly a lethal one. The conflicting opinions and doubts this fallacy has given origin to, have induced the author to follow a plan whereby it may be completely avoided.

In the first place, the minimum fatal dose of physostigma for the species of animal employed was accurately determined by a number of preliminary experiments; so that the weight of the animal being ascertained, it was an easy matter to be certain of the dose that could kill it. Then, in those experiments where an animal recovered after the administration of a dose of atropia given in combination with a dose of physostigma, equal to or in excess of the minimum fatal, it was killed many days afterwards, and when the effects of the two substances had completely disappeared, by a dose of physostigma, equal to or less than that from which it had previously recovered. Therefore, when the administration of atropia prevented an otherwise fatal dose of physostigma from causing death, a perfect demonstration was obtained of the power of atropia to produce some physiological action or actions that counteracted some otherwise lethal action or actions of physostigma.

In the preliminary note referred to, it was suggested that, as both atropia and physostigma are capable of producing a number of different actions, several of which may not be mutually antagonistic, and that, as both substances are capable of producing several actions of a similar kind, considerably less potent to cause death than those by which their fatal effects are usually induced, it would probably be found that a region exists where the non-antagonized and the similar actions are present in sufficient degrees of activity to be themselves able to produce fatal results. This anticipation has proved to be correct. A large number of experiments have been made, by which the region of the successful antagonism of fatal doses of physostigma has been defined with considerable exactness. The smallest and the largest doses of atropia that are able to prevent death after the administration of different fatal doses of physostigma, and the maximum fatal dose of physostigma that is capable of being rendered non-fatal by atropia were ascertained, and it was found that beyond these various points death may be produced by combined doses of the two substances, either by some non-antagonized action belonging to one or other of them, or by a combination of similar actions belonging to both.

As the above results could be obtained only by performing a very large number of experiments, rabbits were the animals selected, it being impossible to obtain a sufficient number of dogs, or other convenient animal. The weight of animal employed was, as nearly as possible, three pounds; and when below or in excess of this a correction was made, so that each dose represented three pounds weight of animal.

In one portion of this investigation, experiments were performed in which physostigma was given five minutes after atropia, both substances being injected under the skin. In the first series, the dose of physostigma was the minimum fatal, and the doses of atropia ranged from one that was too small to prevent the lethal action of this dose of physostigma, through a number of gradually increasing doses of atropia that were able to prevent death, until a dose was found whose administration resulted in death. Similar series of experiments were made with doses of physostigma, one and a half times, twice, two and a half times, thrice, and three and a half times as large as the minimum fatal. With the minimum fatal dose of physostigma, it was found that while ·01 grain of atropia is too small to prevent death, ·015 grain is able to do so; and that with any dose ranging from ·015 grain to 5·2 grains the lethal effect of this dose of physostigma may

* Abstract of a Paper read before the Royal Society of Edinburgh, May 29, 1871.

† June, 1871.—While this Abstract is passing through the press, the author has received a paper by M. Bourneville, in which the above result is satisfactorily confirmed by experiments on guinea-pigs.

be prevented; while if the dose of atropia be 5·3 grains or more, the region of successful antagonism is left, and death occurs. With one and a half times the minimum fatal dose of physostigma, successful antagonism was produced with doses of atropia ranging from ·02 grain to 4·2 grains: with twice the minimum fatal of physostigma, with doses of atropia ranging from ·025 grain to 3·2 grains; with two and a half times the minimum fatal of physostigma, with doses of atropia ranging from ·035 grain to 2·2 grains; with thrice the minimum fatal of physostigma, with doses of atropia ranging from ·06 grain to 1·2 grain; and with three and a half times the minimum fatal dose of physostigma, with doses of atropia ranging from ·1 grain to ·2 grain. Successful antagonism could not be obtained above this dose, and, accordingly, three and a half times the minimum fatal dose of physostigma would appear to be about the largest quantity whose lethal action may be prevented by administering atropia five minutes previously.

A similar series of experiments has been made, in which physostigma was administered five minutes before atropia, and the results were essentially the same, excepting that the region of successful antagonism was found to be more limited.

Series of experiments were also made, in each of which the doses of physostigma were the same, and the doses of atropia varied; while with each dose of atropia, several experiments were made which differed from each other by a difference in the interval of time between the administration of the two substances.

It seemed of interest to ascertain what dose of atropia is required to produce death with a dose of physostigma below the minimum fatal. The experiments performed for this purpose show that when one half of the minimum fatal dose of physostigma is given five minutes after atropia, so large a dose of the latter substance as 9·8 grains is required in order to cause death; recovery taking place with doses ranging from 3 to 9·5 grains.

The minimum fatal dose of sulphate of atropia given alone was found to be twenty-one grains for a rabbit weighing three pounds. It is, therefore, remarkable that the $\frac{3}{200}$ths of a grain can prevent a dose of physostigma, equal to the minimum fatal, from causing death, and that the $\frac{1}{10}$th of a grain is capable of rendering non-fatal a dose of physostigma, equal to three and a half times the minimum fatal.

Excepting dilatation of the pupils, these minute doses of atropia, and indeed any dose capable of antagonizing the lethal action of physostigma, are unable to produce any symptom recognizable by a mere inspection of the animal. Still, they undoubtedly produced energetic physiological effects—effects, however, which it is unnecessary to describe in this brief abstract. It is sufficient to point out that the notion, which exists in many quarters, that rabbits can scarcely be affected by atropia is an erroneous one.

Without referring to the other results obtained in his investigation, the author pointed out, in conclusion, that unless the antagonism between any two active substances be examined in the manner indicated in this communication, no satisfactory proof of its existence can be obtained. The superficial area of the region should always be defined, otherwise indications of antagonism obtained by one observer will be liable to be discredited by those who subsequently examine the subject. The first observer may succeed in performing an experiment within the area of successful antagonism, and thus feel satisfied of its existence; but his successors may fail in obtaining any proof by so varying the dose of one or other substance as to pass the limits of the region of success. Feeling assured that many examples of successful antagonism, besides the one he had the honour of bringing before the Society, will yet be discovered, the author could not avoid the conclusion that the imperfect methods of investigation hitherto pursued are accountable for the absence of success that has attended the numerous researches made on this subject—a subject, it need scarcely be added, of the greatest importance to toxicology and to scientific therapeutics.

THE GASEOUS AND LIQUID STATES OF MATTER.

BY THOMAS ANDREWS, M.D., F.R.S.,

Vice-President of Queen's College, Belfast.

(*Concluded from page* 145.)

At 32°·5 the fall, when liquefaction might be expected, is less abrupt than at 31°·1; and at 35°·5, although still manifest, it is further reduced. At 48°·1 the fall shown at lower temperatures can no longer be distinctly observed, and the curve representing the change of volume approximates to that of a perfect gas. There can be little, if any, doubt that at a higher temperature carbonic acid would behave under augmenting pressures nearly as nitrogen or hydrogen.*

I have frequently exposed carbonic acid, without making precise measurements, to much higher pressure than any of the foregoing, and have made it pass without break or interruption from what is regarded by every one as the gaseous state, to what is, in like manner, universally regarded as the liquid state. Take, for example, a given volume of carbonic acid gas at 50° C., or at a higher temperature, and expose it to increasing pressure till 150 atmospheres have been reached. In

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* These different modes of passing from the gaseous to the liquid state are admirably illustrated by a solid model constructed by Prof. J. Thomson, which was exhibited at the lecture. I have been favoured by Prof. Thomson with the following description of this model:—

"The model combines Dr. Andrews' experimental results in a manner tending to show clearly their mutual correlation. It consists of a curved surface referred to three axes of rectangular co-ordinates, and formed so that the three co-ordinates of each point in the curved surface represent, for any given mass of carbonic acid, a pressure, a temperature and a volume, which can coexist in that mass.

"In Dr. Andrews' diagram of curves, published in his paper in the 'Transactions of the Royal Society for 1869,' p. 583, the experimental results, for each of several temperatures experimented on, are combined in the form of a plane curved line referred to two axes of rectangular co-ordinates. The curved surface in the model is obtained by placing these curved lines with their planes parallel to one another, and separated by intervals proportional to the differences of the temperatures to which the curves severally belong, and with the origins of co-ordinates of the curves situated in a straight line perpendicular to their planes, and with the axes of co-ordinates of all of them parallel in pairs to one another, and by cutting the curved surface out so as to pass through those curved lines smoothly or evenly.

"The curved surface so obtained exhibits in a very obvious way the remarkable phenomena of the voluminal conditions at and near the critical point of temperature and pressure in comparison with the voluminal conditions throughout other parts of the indefinite range of gradually-varying temperatures and pressures. This curved surface also helps to afford a clear view of the nature and meaning of the continuity of the liquid and gaseous states of matter. It does so by its own obvious continuity throughout the expanse to which it might be extended round the outside of the critical point in receding from the range of the points of pressure and temperature where an abrupt change of volume can occur by gasification or condensation. On the curved surface in the model, Dr. Andrews' curves for the temperatures 13°·1, 21°·5, 31°·1, 35°·5 and 48°·1 Centigrade, from which it was constructed, are shown drawn in their proper places. The model admits of easily exhibiting in due relation to one another a second set of curves in which each curve would be for a constant pressure, and in which the co-ordinates would represent temperatures and corresponding volumes. It serves generally as an aid towards bringing the whole subject clearly before the mind."

this process its volume will steadily diminish as the pressure augments, and no sudden diminution of volume, without the application of external pressure, will occur at any stage of it. When the full pressure has been applied, let the temperature be allowed to fall till the carbonic acid has reached the ordinary temperature of the atmosphere. During the whole of this operation no breach of continuity has occurred. It begins with a gas, and by a series of gradual changes, presenting nowhere any abrupt alteration of volume or sudden evolution of heat, it ends with a liquid. The closest observation fails to discover anywhere indications of a change of condition in the carbonic acid, or evidence, at any period of the process, of part of it being in one physical state and part in another. That the gas has actually changed into a liquid would, indeed, never have been suspected, had it not shown itself to be so changed by entering into ebullition on the removal of the pressure. For convenience, this process has been divided into two stages, the compression of the carbonic acid, and its subsequent cooling; but these operations might have been performed simultaneously, if care were taken so to arrange the application of the pressure and the rate of cooling, that the pressure should not be less than 76 atmospheres when the carbonic acid had cooled to 31°.

We are now prepared for the consideration of the following important question. What is the condition of carbonic acid when it passes, at temperatures above 31°, from the gaseous state down to the volume of the liquid, without giving evidence at any part of the process of liquefaction having occurred? Does it continue in the gaseous state, or does it liquefy, or have we to deal with a new condition of matter? If the experiment were made at 100°, or at a higher temperature, when all indications of a fall had disappeared, the probable answer which would be given to this question is that the gas preserves its gaseous condition during the compression; and few would hesitate to declare this statement to be true if the pressure were applied to such gases as hydrogen or nitrogen. On the other hand, when the experiment is made with carbonic acid at temperatures a little above 31°, the great fall which occurs at one period of the process would lead to the conjecture that liquefaction had actually taken place, although optical tests carefully applied failed at any time to discover the presence of a liquid in contact with a gas. But against this view it may be urged with great force, that the fact of additional pressure being always required for a further diminution of volume is opposed to the known laws which hold in the change of bodies from the gaseous to the liquid state. Besides, the higher the temperature at which the gas is compressed, the less the fall becomes, and at last it disappears.

The answer to the foregoing question, according to what appears to me to be the true interpretation of the experiments already described, is to be found in the close and intimate relations which subsist between the gaseous and liquid states of matter. The ordinary gaseous and ordinary liquid states are, in short, only widely separated forms of the same condition of matter, and may be made to pass into one another by a series of gradations so gentle that the passage shall nowhere present any interruption or breach of continuity. From carbonic acid as a perfect gas to carbonic acid as a perfect liquid, the transition we have seen may be accomplished by a continuous process, and the gas and liquid are only distant stages of a long series of continuous physical changes. Under certain conditions of temperature and pressure, carbonic acid finds itself, it is true, in what may be described as a state of instability, and suddenly passes, with evolution of heat, and without application of additional pressure or change of temperature, to the volume, which by the continuous process can only be reached through a long and circuitous route. In the abrupt change which here occurs, a marked difference is exhibited, while the process is going on, in the optical and other physical properties of the carbonic acid which has collapsed into the smaller volume, and of the carbonic acid not yet altered. There is no difficulty here, therefore, in distinguishing between the liquid and the gas. But in other cases the distinction cannot be made; and under many of the conditions I have described, it would be vain to attempt to assign carbonic acid to the liquid rather than the gaseous state. Carbonic acid, at the temperature of 35·5°, and under a pressure of 108 atmospheres, is reduced to $\frac{1}{430}$ of the volume it occupied under a pressure of one atmosphere; but if any one ask whether it is now in the gaseous or liquid state, the question does not, I believe, admit of a positive reply. Carbonic acid at 35·5°, and under 108 atmospheres of pressure, stands nearly midway between the gas and the liquid; and we have no valid grounds for assigning it to the one form of matter any more than to the other. The same observation would apply with even greater force to the state in which carbonic acid exists at higher temperatures and under greater pressures than those just mentioned. In short, the passage under great pressures from the liquid to the gaseous state may be effected by the application of heat without break or breach of continuity. That a marked change in the physical properties of the substance occurs during this process is no objection to its being continuous. If mercury as a liquid is opaque and as a gas is transparent, the red and translucent bromine, on the other hand, when heated above the critical point, becomes so opaque as almost to resemble a mass of resin. Frankland has shown that the flame of hydrogen becomes continuous when the gas is burned under a pressure of 20 atmospheres, and these experiments have been since extended by the same able chemist and Lockyer. We must not, however, suppose that one intermediate state exists between liquid and gas; on the contrary, an indefinite succession of intermediate states may truly be said to connect the liquid proper and the gas proper; in other words, the passage is continuous. When the critical point is attained, tho density of the liquid and gas becomes the same, and the tube is filled with homogeneous matter.

As regards the question of the continuity of the solid and liquid states, it would be necessary, in order to establish this continuity, to obtain, by the combined action of heat and pressure, the solid and liquid of the same density and of like physical properties. To accomplish this result will probably require pressures far beyond any which can be reached in transparent tubes; but it may be possible to show by experiment that the solid and liquid can be made to approach to the required conditions.

THE HONEY TRADE.

BY P. L. SIMMONDS.

The following facts connected with the honey trade, showing the great commercial importance of this product of the bee in various countries, are taken from the *Journal of Applied Science*.

Mr. Braithwaite Poole, some years ago, in his work on the 'Statistics of British Commerce,' estimated, after careful inquiries of the quantities transported over the kingdom (for which he had peculiar facilities), that the production of honey here amounted to 2000 tons, which he valued at £80,000. The annexed figures will give an idea of the foreign imports. The average of the four years ending 1858 was 3712 cwt., and the last three years for which we have official returns give the following:—

	Quantity. Cwt.	Value.
1867	5,663	£8,681
1868	6,674	10,077
1869	14,820	22,570

At the present day all the civilized countries of the globe produce honey, and give more or less attention to apiculture, according as the climate and vegetation are suited to the bees. The most recent statistics available give the following estimate of the number of hives, with the authority:—

	Number of hives.
France (Block's Statistics) . .	2,200,000
Austria	2,733,000
Prussia Proper (M. Wiebahn) .	761,284
Bavaria (Block)	202,923
Hanover (M. Wiebahn) . . .	230,689
Electoral Hesse (M. Wiebahn) .	40,000
Duchy of Nassau (Block) . . .	15,097
„ Baden „ . . .	75,111
Würtemberg	100,000
Oldenburg (Block)	45,000
Spain	758,788

The latest official statistics for France gave the total value of hives at 16½ million francs, or about 6*s*. per hive and its contents, but half of this may be set down for the hive and its protective supports, etc. The mean quantity of the honey produced yearly was stated at 6,670,000 kilogrammes, worth a little more than 5½ million francs. This would give about 6 lb. of honey for each hive. In 1863 the import of honey into France amounted to 185,797 kilogrammes, and the exports to 420,568 kilogrammes; in 1866 the imports were 259,500 kilogrammes, valued at 389,400 francs, and the exports 785,900 kilogrammes.

If a piece of fresh honeycomb, with its cells full of honey, be inverted on a dish, the pure honey will flow out, constituting virgin honey. If this be allowed to rest for some time, it will divide itself into two parts, the one consisting of a number of sphericles of a pale yellowish or almost whitish colour, and formed of a number of crystals radiating from the centre, and the other a white syrup. The crystalline sphericles are a true sugar, and in every sense identical with grape or fruit sugar, whilst the syrup contains the same sugar with a certain portion of wax, and very often, and indeed always, a quantity of sugar having the same composition as cane sugar, but in an uncrystallizable form. Gum and mannite, or manna sugar, have also been obtained, especially in the turpentine-like honey; but it is probable that they are products of decomposition, for they are not present in good honey; moreover, we know that under certain circumstances cane sugar is decomposed into mannite, gum and lactic acid, which is also usually present in honey whenever mannite has been noticed in it. The tendency of some honeys to a turpentine consistency appears to be intimately connected with the system of management of the bees, with the plants upon which they feed, and upon many other little understood causes.

Honey was used instead of sugar until the means of extracting that substance in quantity from the sugar-cane was found, and more recently its extensive fabrication from the beetroot. Honey is employed for food, for drink and for medicine; by mixing it with water and allowing it to ferment, hydromel is obtained, and honey wine, metheglin or mead, was long a popular beverage. By distillation alcohol is obtained. Honey is also employed in confectionery and pastry, for making gingerbread. In the fabrication of liquors it is used in sweetening Dantzic spirit, maraschino, rosoglio, etc. Real mead or metheglin is a fermented wine, but many drinks made from honey are little else than honey water or hydromel. Such is the sbitene of Russia, which consists of honey mixed with boiling water and boiling milk, and seasoned with pepper.

Raw honey varies in its properties according to the nature of the vegetation from which the bees have gathered their food; according as the honey is obtained from cultivated or wild bees: according to the method and attention used in separating it from the wax, as well as according to the age of the honey and the manner of preserving it. The preservation of honey is best effected in small wooden tubs with well-closed lids, so that such a vessel, when once opened, may be emptied in three or four months. The honey, after having run and been pressed out of the comb at a temperature of from 88° 25′ to 90° Fahrenheit, should be immediately poured into these vessels, which ought to be put away in a dry, cool spot. The honeys of different parts even of the same country will differ. Thus the honeys of Narbonne, England and Minorca can be distinguished by their flavours.

In France a good swarm of bees in two years will yield nearly 30 lb. of honey, and they are still more profitable in countries that are covered with flowers the greatest part of the year.

Honey is separated from the comb by dripping and by expression, and a still inferior kind is obtained by heating the comb before it is pressed. Virgin honey is that obtained from the young hives which have not swarmed. The two kinds of honey usually met with are the white and the yellow. The white trickles out spontaneously from the comb. The combs are broken soon after they are made, and laid upon hurdles or mats of osier, or on linen cloth, fastened at the four corners to as many posts, and then an excellent pure honey is obtained, which hardens in a short time. This is put into glazed earthen pots. The best French honey is that from the province of Languedoc, known in commerce as Narbonne honey. It should be new, thick, granulated, of a clear, transparent white colour. If it is very pure, it is almost as hard as sugar candy. The honey made in mountainous countries is more highly flavoured than that of low grounds; and that made in the spring is more highly esteemed than that gathered in the summer or autumn.

Yellow honey is obtained by pressure from all sorts of honeycombs, and even from those whence the virgin honey has been extracted. The combs are broken and heated with a little water in basins or pots, kept continually stirred. They are then put into bags of thin linen cloth, and placed in a press to squeeze out the honey. The wax remains in the bag, but some small portions will generally escape through the bag with the honey.

The colour of honey varies very considerably, according probably to the difference of the vegetation on which the insects feed. Sometimes it is of a green hue, sometimes it is black, blood red, and at others it offers various shades of orange or yellow, and there are instances on record of dysentery and death occasioned by the noxious qualities it contains. The island of Bourbon yields a delicate kind of green honey, which is exported to India and bears there a very high price. The same coloured honey occurs also in Southern Africa, and it is not improbable that in both localities the same species of bee will eventually be discovered to exist. At the island of Bulama, and in other places, there is a fly called the honey fly, which deposits its sweets in the hollows of trees, but the quantity is so trifling as scarcely to deserve notice. In the island of Madagascar, also, other species of flies are reported to produce honey. Honey is produced very abundantly in the island of Candia, and more so in the greater part of the islands of the Archipelago than almost anywhere else. The Sicilian honey is particularly high-flavoured, and in some parts of the island it is said even to surpass that of Minorca, which is no doubt attributable to the large quantity of aromatic plants which overspread the country. There the honey is gathered three times in the year; in July, August and October. It is found by the peasants in the hollows of trees and rocks. The country of the Upper Hybla is still, as formerly, the part of the island that is most celebrated for this article.

(*To be continued.*)

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THE PHARMACOPŒIA COMMITTEE.

IN the columns of a recent impression we reported the Proceedings of the General Medical Council, with reference to its Pharmacopœia Committee. After the publication of the British Pharmacopœia of 1867, this committee was appointed to watch over the progress of pharmacy, and make such additions and corrections as would further facilitate hereafter the preparation of the next edition of the British Pharmacopœia. The sum of £50 annually was placed at its disposal by the Council. The general satisfaction given by the present edition induced the committee to retain Dr. REDWOOD's services, for the purpose of reporting to it all matters relevant to the subject, which might come under his notice. The work done by this committee does not appear to have given satisfaction to the Irish members of the Council,—there having been only one meeting of it during the last two years. Dr. AQUILLA SMITH seemed to feel ashamed of his position as one of its members; Dr. APJOHN objected to the committee being re-appointed, and proposed that the task of collecting information for the new edition be entirely entrusted to Dr. REDWOOD, but his motion did not find a seconder. We are glad that such was the case, and, although the motion implied such confidence in Dr. REDWOOD, and thus conferred an honour on English pharmacy, still there is a neutral ground on which the medical practitioner and pharmacist must meet in compiling a Pharmacopœia. Take, for example, remedies for external use,—a knowledge of therapeutics is required to adjust the strength of these and many other preparations. Dr. REDWOOD, we have no doubt, will do his best with the "villainous saltpetre," and "parmaceti," but we object to the Pharmacopœia committee shirking the responsibility which they, on their appointment, incurred. Their duties, as yet, have been light, because the Pharmacopœia, up to the date of its publication, was as perfect as such a work could be, but as time rolls on, pharmacy—a practical art—cannot remain quiescent. Improvements in manufacture, and new medicines must be noted.

On the Continent, the compilation of a universal Pharmacopœia has been broached more by the pharmacists than the medical practitioners. This for central Europe is a great desideratum; and so far as the German empire is concerned, uniformity will there be shortly attained by a *German Pharmacopœia*. We in our insular position may not feel the need of this uniformity so much as some of the minor German States, yet when reference to pharmaceutical preparations is made in foreign medical literature, the English reader is painfully embarrassed in trying to comprehend what is meant. In translations of such works published by the Cavendish Society, for example, the translators, to make the subject intelligible, have great difficulty in explaining by notes the composition of the pharmaceutical preparations mentioned in the text of the work. Pharmacists, both at home and abroad, have also a much greater difficulty in dispensing accurately foreign prescriptions, as these often bear no trace of the country in which they were written, or the Pharmacopœia to which they refer. Would not the Pharmacopœia Committee be fulfilling its functions by making overtures to the authorities of Continental nations to try to bring about such a uniformity as would be beneficial to all?

DR. GREENHOW'S REPORT ON THE EXAMINATIONS OF THE PHARMACEUTICAL SOCIETY CONDUCTED IN LONDON.

THE Thirteenth Report of the Medical Officer of the Privy Council has just been issued. It contains, in the Appendix, Dr. GREENHOW's Report on the Examination of the Pharmaceutical Society conducted in London. This Report is of considerable interest, as in it Dr. GREENHOW describes the methods adopted in the various examinations, and gives the opinion which he, as the medical officer attending on behalf of the Privy Council, has formed, respecting the standard adopted in each examination, and the manner in which the examiners perform their duties. We, therefore, print it entire:—

"During the year 1870 the Board of Examiners of the Pharmaceutical Society held 26 meetings: four for the Preliminary Examination in Latin, English, and arithmetic, and 22 for the technical examinations.

"At the Preliminary Examinations 742 candidates presented themselves, of whom 521 passed, and became thereby qualified to present themselves for the Minor Examination, whilst the remaining 221 were rejected. I have carefully read the papers set for these examinations, and also many of the answers written both by successful and unsuccessful candidates, and am of opinion that the examination is not too severe nor the mode of conducting it too rigid, and that the value of the written answers has been estimated with accuracy and impartiality. In these circumstances, the rejection of so large a proportion of the candidates, on the score of defective attainments in the main subjects of middle-class instruction, indicates the low standard of general education prevalent among those classes of society from which the candidates are chiefly derived; and renders it obvious that, until some improvement takes place in this respect, the standard of preliminary examination by the Pharmaceutical Society is pitched as high as can be attempted with practical advantage.

"Of the 22 meetings held for the examination of candidates in technical subjects, 13 were devoted to the Major and Minor Examinations and 9 to the Modified Examination.

"During the year 1870, 258 candidates presented themselves for the *minor* examination, of whom 178 passed and were registered as chemists and druggists, and 80, or nearly one-third, were rejected as incompetent. Of these 80 unsuccessful candidates 50 failed to obtain the number of marks requisite for passing the examination as a whole; the remaining 30 obtained the requisite total number of marks calculated on all the subjects collectively, but failed to obtain the numbers requisite for passing in all the separate subjects. Of these 30 candidates, 7 failed in one of the six subjects comprised in the examination, 18 in two, 4 in three, and 1 in four subjects respectively, and by the regulations of the Pharmaceutical Society they must present themselves for re-examination in those separate subjects in which they failed to pass, before they can become qualified for registration as chemists and druggists.

"I should, perhaps, briefly repeat here what I explained in my report of last year, that in order to pass any of the examinations a candidate must obtain not less than half the number of marks given for the examination as a whole, and is even then only entitled to pass provided that in none of the separate subjects comprised in the examination his number of marks has fallen below one-fourth of the standard number allotted to the subject. It is true that even though a candidate may have failed to obtain one-fourth of the standard number of marks in a single subject, if his excellence in all the other subjects be remarkable he may still possibly be allowed to pass by a special vote of the Board of Examiners; but practically such a case very rarely occurs. Further, a candidate who has obtained the required total number of marks calculated on all the subjects of examination collectively, but has fallen below one-fourth of the standard number in one or more of the separate subjects, is required to present himself for re-examination, not only in those subjects, but also in any of the other subjects in which he may have failed to obtain one-half of the standard number of marks. By these arrangements, which appear to me to be equitable, superior excellence in some branches of the examination is to a certain degree set against any weakness in others which does not involve incompetence in essentials.

"For the *major* examination 75 candidates presented themselves during the year, of whom 59 passed and were registered as pharmaceutical chemists, whilst 16, or more than one-fifth, were rejected. Nor can this be regarded as otherwise than a large proportion, when it is considered that all these candidates must have previously passed the minor examination, and were thereby already qualified to carry on business as chemists and druggists. The examination of candidates for the major qualification is conducted partly by means of written papers; partly by *vivâ voce* questions and answers upon the nature, quality, composition and preparation of drugs and chemicals placed before the candidates; and partly by practical examination in the dispensing and compounding of prescriptions, and in the application of the requisite chemical tests for determining the nature of one or more of the definite chemical compounds employed in medicine. The papers written in answer to questions set by the examiners show that the candidates have received very different degrees of elementary and technical education. Some of the papers evince a really high degree of cultivation, whilst others fall below mediocrity. The practical examination in testing is conducted on the same day as the written examination, and each candidate is required to determine, by means of the appropriate chemical tests, the presence, in a given solution, of some chemical comprised in the British Pharmacopœia. The candidate is not made aware until the moment what solution will be presented to him for examination, and he applies his tests under the eye of the examiner, who takes each candidate in turn at a counter upon which are placed the requisite apparatus and tests. Solutions of such salts as the perchloride of mercury, sulphate of copper, perchloride of iron, bromide of potassium, acetate of lead and alum were given to be tested on the occasions on which I was present. Of the sixteen candidates who were unsuccessful in the major examination, thirteen failed to obtain the number of marks necessary in order to pass the examination as a whole; the remaining three obtained the requisite total calculated on all the subjects collectively, but fell below the standard minimum of marks in one or more of the separate subjects, and will, therefore, be required to undergo a re-examination in those subjects before they can be registered as pharmaceutical chemists.

"The *modified* examination was instituted, as I explained last year, for the benefit of such persons as, being of full age, had been actually engaged in the dispensing and compounding of prescriptions as assistants to pharmaceutical chemists, or to chemists and druggists, for a term of not less than three years previous to the passing of the Pharmacy Act of 1868.

"The modified examination entitles such candidates, if they can give proof of reasonable practical competence, to be registered as chemists and druggists without having attained the standard of scientific knowledge now fixed for the minor examination which confers the same title. It will therefore be discontinued so soon as the class of persons for whose benefit it was instituted shall have all been examined. During the past year 348 candidates presented themselves for this examination, of whom 231 passed and were registered as chemists and druggists, and 117 were rejected. Of these latter, 102 failed to obtain the number of marks required to enable them to pass the examination as a whole; the remaining 15 obtained the total number, but failed to obtain the required minimum in one or more of the separate subjects. Two of the 15 failed in two subjects and 13 in one subject each; but the four subjects which alone are comprised in this examination are all so indispensable, that incompetence in any one of them would render a person quite unfit to be trusted with the responsible duty of compounding and dispensing prescriptions. The candidates in these modified examinations have appeared to me to be treated by the examiners with equal consideration and tact, so that while on the one hand they are not rejected on matters of minor importance or technical form, on the other hand they are not passed unless their practical competence be proved sufficient to guarantee the safety of the public. The fact, therefore, of the rejection of fully one-third of the whole number of candidates, affords conclusive evidence of the danger to which the public must have been exposed, by the employment of so large a proportion of unskilled persons as assistants in the business of selling drugs and compounding prescriptions, previously to the passing of the Pharmacy Act.

"During the year 1870, I was present at the pharmaceutical examinations on thirteen occasions, namely, on January 7th and 19th, on February 16th, April 20th, May 6th and 25th, July 1st and 13th, October 19th and 20th, and on December 2nd, 21st, and 23rd. Four of these were modified examinations, and the remaining nine major and minor examinations.

"No change requiring mention has been made during the past year in the mode of conducting any of the examinations, but I observe some minor improvements in method, and I am led to believe that it is the intention of the Board of Examiners gradually to raise the standards of competence, both for the minor and major examinations. I have no suggestions to offer on this head, with reference either to the minor or the modified examination, both of which appear to me to be as high as could be enforced with advantage at the present moment. But with reference to the major examination I would venture to suggest that, as the candidates for this examination are already qualified to carry on business as chemists and druggists, there would be no hardship in fixing the standard for passing it somewhat higher; thus making a greater difference than now exists between the grade of chemist and druggist and that of pharmaceutical chemist, and ensuring in those who bear the latter title a higher degree of pharmaceutical skill. I am of opinion further that, inasmuch as the increase of practical pharmaceutical skill is what will most conduce to the service of the public, the standard of the major examination should be heightened principally in its practical aspects, and that especially a profounder acquaintance with practical chemistry, and a more thorough grammatical knowledge of Latin should be required. With this view I would recommend that candidates for this examination should be required to estimate practically, by means of the volumetric test solutions appended to the British Pharmacopœia, the strength of such officinal preparations as are directed to be so estimated, and also to show considerable proficiency in reading difficult or unusual prescriptions written in the Latin language. I have, indeed, reason to believe that it is the intention of the Board of Examiners to carry out these improvements as they shall find practicable, but I hope that this expression of opinion on my part may strengthen their hands, and assist them to realize their intentions more speedily.

"In conclusion, I have much satisfaction in being able to report that the examinations of the Pharmaceutical Society, as conducted during the past year, afford a sufficient guarantee for the competence of persons admitted during that period to registration under the Pharmacy Act of 1868."

REPORT OF THE COMMISSIONERS OF INLAND REVENUE.

The Fourteenth Report of the Commissioners of her Majesty's Inland Revenue has been issued, giving the returns for the years ending 31st March, 1870–1871.

The quantity of spirit methylated during the year ending 31st March, 1870, was 977,469 gallons, being an increase of 91,510 gallons on the previous year. There has been again a small increase in the quantity during the present year, but not to such an extent as to call for any special remark.

The Commissioners call attention to an experiment made by a large landed proprietor of distilling spirit from beetroot grown in this country. In 1869, 350 acres were planted, and of the produce about 3500 tons of one produce was reserved for distillation. In consequence of the machinery being incomplete, the work was not commenced until January. The delay prevented the completion of the operation before the middle of April, by which time the beet was much injured by frost, spring growth, and storing, so that less extract and alcoholic product was obtained than in the earlier part of the year,—the quantity of spirit obtained in April being five per cent. less than in January. The total produce of spirits was 39,569 proof gallons, the average quantity per ton of beet being about 11 proof gallons. The quality of the spirit was superior to that usually obtained from beetroot.

During the year 1870–71 this distillery has been worked on a more extensive scale, but further experience is necessary before the experiment can be said to establish the success of beetroot distillation in this country.

In the Report, by the Principal of the Laboratory in connection with the department, the result is recorded of an investigation made to determine the proportion of essential oils in perfumed spirits as imported and their effect upon the bulk and strength of the alcohol present. For a considerable time back urgent representations had, from time to time, been made by English wholesale perfumers, to the effect that their trade was materially injured by the admission of foreign perfumed spirits into this country at a uniform duty of 14*s.* per bulk gallon, as such spirits were frequently of as high a strength as 60·0 o.p. On the other hand, it was contended that the essential oils largely contributed to the bulk of such spirits, and also that they interfered with the action of the hydrometer by showing the perfumed spirits to contain more alcohol than was actually present, and that therefore it would be unjust to charge them as ordinary spirits; it was also maintained that the various descriptions of perfumed spirits imported varied considerably in strength, and that 14*s.* per bulk gallon was a fair average charge. On the question being referred to this department, a method was devised of effectually separating and measuring the essential oils present in the perfumed spirits, and it was found that their effect upon the bulk of such spirits was comparatively small, and also that the hydrometer was scarcely affected by their presence. The experiments thus showed that English perfumers were in many cases subjected to unfair competition with their foreign rivals.

The number of samples of home-made glucose examined have been 321, representing 25,737 cwts., as against 199 samples and 16,676 cwts. in the previous year. Glucose imported from the Continent also shows a large increase, the number of samples having been 390 as compared with 222 in 1868.

Of tobacco 152 samples have been examined; 28 contained adulterants such as sugar, liquorice, and logwood. In one case the sample was adulterated with 30 per cent. of liquorice. The amount of tobacco cleared for consumption during the year 1869 gave an average of 1 lb. 5¾ oz. per head of the population, against 13¾ oz. in 1841. Adulterated samples of snuff have been found to contain oxide of iron, alumina, glass, coal, pinewood, fustic, straw, and an excessive amount of sand.

Sixty-three samples of coffee have been examined during the year, of which 32 were genuine; 30 were adulterated with roasted locust beans to an extent varying from ten to thirty per cent., and one with a vegetable substance that could not be identified. It having been ascertained that the whole of these adulterated samples had been manufactured by a wholesale firm in London upon unentered premises, the firm was prosecuted and a conviction obtained.

The difference in price between methylated spirit and pure spirit of wine is so great that it need occasion no surprise if a few instances are now and then discovered of the illegal substitution of the former for the latter. During the past year eight samples of medicines for internal use were found to have been prepared from methylated spirit. They comprised sweet spirits of nitre, paregoric, and the tinctures of catechu, rhubarb, and cardamoms.

Three samples sold as "Finish" have been found to consist of methylated spirit only. One of the samples was deeply coloured with aniline red dye, and had been illegally supplied in that state to a firm of colour-makers who wished to use methylated spirit for the purpose of trade without being subject to the usual regulations.

The number of samples of wood spirit examined for methylating purposes has been 326—the largest number hitherto received in any one year. Two of the samples were found to contain an admixture of ethylic alcohol to the extent of 10 and 45 per cent. respectively. Both were from the same methylated spirit-maker, against whom proceedings were taken, and the full penalties of the law recovered.

During the year 635 samples of lime- and lemon-juice, and 100 samples of spirits for fortifying the same, have been examined. Eighty of the former, and seven of the latter were recommended for rejection. For the first three months of the year, viz., from April 1st to June 30th, inclusive, samples of lime- and lemon-juice and spirits from the Port of London only were examined in this department, but from July 1st samples have, in addition, been received from the whole of the outports in the United Kingdom. Since the month of December last, by order of the Board of Trade, it has been optional on the part of the merchant whether he would have his spirits examined by the customs at the port where bonded, or at this laboratory.

In addition to the foregoing, upwards of eleven hundred samples of miscellaneous substances have been examined, including sugar, soap, pyroligneous acid, various wines, beers, and liqueurs, perfumed spirits, gin, Bay rum, sweet spirits of nitre, ether, beet syrup, etc.

We continue to receive satisfactory accounts of the cultivation of the cinchonas from nearly all parts of the world where they have been introduced. The East Indian cultivation is, perhaps, the most important; the plantations in Sikkim Himalaya, on the Neilgherry Hills, the Khasia Mountains, and also in Ceylon, are now established facts, and have begun to yield bark, which has found its way into the English market; that produced in the hill districts of India realizing a price equal to the produce of South America. Dr. Hooker in his annual report says that a ton of prepared bark has been sent to London from Ceylon, the produce of seeds sent to Dr. Thwaites from Kew in 1861. The late Dr. Thomas Anderson, to whom much credit is due for the successful introduction and cultivation of the plant in Sikkim, told us shortly before his death that ere long the produce of the Sikkim plantations would be so large that the bark might be disposed of at the rate of 3*d.* per lb.

In Jamaica forty acres of land were planted with cinchonas in 1868; about 40,000 plants occupying this extent of ground, all of which are healthy, their average height being from two to three feet. At the present time about 90 acres are under cinchona cultivation; and at the end of the present year it is expected that there will be 220 acres so occupied with about 200,000 plants. From St. Helena we also learn that the plants are not only thriving, and thus proving that they are perfectly satisfied with the soil and climate of their new island home, but that the plantations are being extended, and that everything connected with the cinchonas is progressing most satisfactorily.

We learn from some recently-published statistics of the University of Edinburgh Botanical Class, that in the session of 1871 the number of pupils was 306. Of these, 241 (including 5 ladies) were medical students, 12 pharmaceutical students and 53 general students.

Mr. J. B. Owen, of Louisville, Kentucky, reports in the *American Journal of Pharmacy*, that he has examined four specimens of subnitrate of bismuth taken from the American market. He found a trace of arsenic in one of the samples, and silver as a chloride was present in three, in one instance to the extent of ·37 per cent.

A nostrum extensively advertised in Philadelphia and its vicinity as an infallible remedy for epilepsy, upon examination appeared to consist of about fifteen grains of bromide of potassium, disguised by the addition of about five grains of powdered gentian root.

The appointments under the Act for regulating pharmacy in the city of New York* have been made by the Mayor. The gentlemen appointed are Mr. William Graham, superintendent of one of the stores of Messrs. Hegeman and Co., Mr. Frohwein, a graduate and one of the officers of the New York College of Pharmacy, Dr. Doremus, formerly professor of chemistry in the same college, and Dr. O'Leary.

* See Vol. I. p. 890.

Proceedings of Scientific Societies.

SOCIÉTÉ DE PHARMACIE DE PARIS.

At the Meeting of this Society, held on the 7th of June, under the presidency of M. St. Martin, Messrs. Sandford, Evans and Hills, of the Pharmaceutical Society of Great Britain, were unanimously elected corresponding members.

M. Méhu presented a specimen of cotton containing about one-tenth of its weight of iodine. This preparation gives off the iodine in the open air, but is easily preserved in well-stoppered bottles. It is prepared by heating the cotton in a water-bath with powdered iodine. If the proportion of the iodine be increased the fibre of the cotton is destroyed, and it becomes pulverulent.

M. Méhu also presented to the Society two specimens of colouring matter obtained from the urine of a patient suffering from albuminuria and diabetes, the one violet-red and the other blue, approaching to indigotin. They had been extracted from the urine, even when putrid, by the simple use of solvents, such as water, alcohol, ether and chloroform.

Dr. Calvert, who was present, said that in England a distinguished chemist, Schunck, had noticed in urine a colourless principle, indican, which becomes blue by exposure to the air, and is susceptible of yielding by decomposition glucose and indigotin.

M. Roucher said that he had obtained the two colouring matters from urine by following the directions of the German chemists. He thought the blue principle differed from indigotin only in its crystalline form, and added that indican resisted putrefaction energetically.

Dr. Calvert made some remarks on disinfectants, in the course of which he said that chloride of lime exercised a rapid but limited action. Thus, in nitrogenous organic matter disinfected by this substance, the putrefaction would recommence after a few days, even while the odour of the chloride of lime was still perceptible.

Dr. De Vrij gave some of the results of his researches upon the cinchona alkaloids.

M. Bourgoin stated that in an investigation of phthalic acid, made with the object of preparing phenylene, he had found that acid to comport itself in a similar manner to the most stable aromatic acids, such as benzoic and camphoric, and that it yielded no trace of phenylene even when placed in conditions the most varied.

BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

(*Continued from page* 153.)

Section B.—Chemical Science.

After the President's address, the reading of papers was commenced by Mr. Dewar reading a preliminary report on the "Thermal Equivalent of the Oxides of Chlorine." This was succeeded by a paper by Dr. Gladstone and Mr. Alfred Tribe, on "Some Experiments on Chemical Dynamics." In the discussion that followed the reading of this paper, some curious facts were mentioned with respect to the action of sugar on metallic iron. It is well known that it has not hitherto been possible, on account of this action to convey sugar in iron ships; but Dr. Calvert stated that he had discovered a very simple method which entirely prevented the action, and he had no doubt that henceforward sugar would be as safely carried in iron ships as in wooden bottoms.

A paper on the "Recent Progress of Chemistry in the United States" by Professor Wheeler, of Chicago, commenced the next day's proceedings; Mr. Henry Deacon gave an account of his "Chlorine Process as applied to the Manufacture of Bleaching Powder on the larger Scale," and a note on "Regianic Acid," a product derived from walnuts, was communicated by Dr. Phipson.

This was followed by a paper by Dr. Calvert on the "Estimation of Sulphur in Coal and Coke." The sulphur found in coal or coke often exists in two states, partly as sulphuric acid combined with lime, and partly as sulphur combined with iron; it is only the latter combination which lessens the commercial value of the fuel. By boiling the powdered coal with a solution of carbonate of soda, the lime composed is decomposed, and by washing the sulphuric acid may be removed; in the residue is contained the sulphur, combined with iron, which is estimated by any of the methods familiar to chemists.

An account of "Some Improvements in Chlorimetry" was given by Mr. I. Smyth. In his opinion the use of the milky solution of bleaching powder as employed in the usual methods of chlorimetry is unsatisfactory, and he accordingly recommends that the chloride of lime be decomposed by a solution of carbonate of soda and filtered from the precipitated carbonate of lime when the amount of available chlorine may be determined in the filtrate by any of the usual methods.

Professor Delffs, of Heidelberg, exhibited some splendid Crystals of Sorbin. This body was discovered nearly twenty years ago by Pelouze, but hitherto nobody has succeeded in preparing it from the source indicated by the distinguished French chemist. Dr. Delffs attributed the want of success to the fact that it was usual to combine the preparation of malic acid with that of sorbin, and he showed that it is only when the production of the former substance is dispensed with that sorbin is obtained. By strictly following the method given by Pelouze, Dr. Delffs obtained a large quantity of fine crystals of sorbin, but on searching for malic acid in the residue, he found that not a trace was present. He attributes its absence to its combination with the radical of alcohol (the malic acid being contained in the alcoholic extract of the berries of *Sorbus Aucuparia*, the source of the body), whereby malate of ethyl is formed, while by assimilating two atoms of water is converted into sorbin. It would appear therefore that no sorbin is contained ready formed in the fruit of *Sorbus Aucuparia*.

Dr. Moffat read a paper on "Ozonometry," in which he stated that ozone test papers do not become permanently coloured in the neighbourhood of cesspools, and that the brown coloration when found is removed by the products of putrefaction. He also stated that light, the humidity of the atmosphere, and the direction of the wind, influence the colouring of the test-paper, moisture with heat accelerating chemical action, while strong wind causes a great quantity of ozone to impinge upon the test-paper in a given time. To counteract the effects of these, he recommended the test-paper to be kept in a box. He next described a tube ozonometer which he had had in use, and gave results obtained by an aspirator ozonometer, and concluded by stating that the results obtained by the aspirator ozonometer were not satisfactory.

On Monday the proceedings commenced with two short papers by the President, Dr. Andrews, "On the Dichroism of the Vapour of Iodine," and "On the Action of Heat on Bromine." The fine purple colour of the vapour of iodine arises from its transmitting freely the red and blue rays of the spectrum, while it absorbs nearly the whole of the green rays. The transmitted light passes freely through a red copper or a blue cobalt glass. But if the iodine vapour be sufficiently dense, the whole of the red rays are absorbed, and the transmitted rays are of a pure blue colour. They are now freely transmitted as before by the cobalt glass, but will not pass through the red glass. The solution of iodine in bisulphide of carbon exhibits a similar dichroism, and according to its density appears either purple or blue when white light is transmitted through it. The alcoholic solution, on the contrary, is of a red colour, and does not exhibit any dichroism. If a fine tube be filled one-half with liquid bromine and one-half with vapour of bromine, and, after being hermetically sealed, be gradually heated until the temperature is above the critical point, the whole of the bromine becomes quite opaque, and the tube has the aspect of being filled with a dark red and opaque resin. A measure of the change of power of transmitting light in this case may be obtained by varying the proportion of liquid and vapour in the tube. Even liquid bromine transmits much less light when heated strongly in a hermetically-sealed tube than in its ordinary state. In connection with this subject, Mr. Dewar exhibited an experiment illustrating the action of light upon peroxide of chlorine.

The Report on the Utilization of Sewage was presented by Mr. Grantham. It was divided under the following heads:—(1.) Experiments on Britton's Farm, Mr. Hope. (2.) Comparison of Results during Winter of Croydon, Norwood and Britton's Farm Experiments, Dr. Corfield. (3.) Report on Analysis in connection with above, Dr. Corfield. (4.) Upward Filtration of Sewage at Ely, Dr. Corfield. (5.) Phosphate Process, Dr. Corfield. (6.) Dry Earth System at Lancaster, Drs. Corfield and Gilbert.

Dr. Bischof read a paper "On the Examination of Water for Sanitary Purposes," in which he sought to show that the appearance of the residue obtained by evaporation, when seen under the microscope, afforded a ready method of detecting sewage contamination.

Among other communications to this section were papers on the "Chemical Constitution of Glycollic Acid and its Heterologues, as viewed in the Light of the Type-nucleus Theory," by Dr. Otto Richter; on the "Constitution of some of the Oxychlorides of Vanadium discovered by Roscoe," by Dr. Thorpe; on the "Dissociation of Molecules by Heat," by Mr. Tichborne; on the "Rate of Action of Caustic Soda on a Watery Solution of Chloracetic Acid," by Mr. J. G. Buchan; "Some Remarks on the Proximate Analysis of Saccharine Matters," by Professor Apjohn; on a "Method of Preserving Food by Muriatic Acid," by the Rev. H. Highton; on the "Constitution of Salts," by Mr. Wanklyn; and a "Method of Testing Wood Naphtha," by Mr. Harkness.

On Saturday, August 5, the section visited the works of Young's Paraffin Light and Mineral Oil Company at Addriwell, West Calder. The visitors were conducted over the works and the various processes were explained by Dr. Playfair, M.P., after which they sat down to a luncheon, Mr. Young in the chair. In proposing the health of Mr. Young, Dr. Playfair said that some idea of the magnitude of the company's operations might be formed from the fact that its sales amounted to upwards of £1000 per day.

Section D.—Biology.

The opening address of this section was delivered by its President, Professor Allen Thomson. After a few preliminary remarks he said that the general title under which this section had met since 1866, viz. Biology, seemed to be advantageous, both from its convenience and as tending to promote the great consolidation of the science, and a juster appreciation of the relation of its several parts. It might be that, looking merely to the derivation of the term, it was strictly more nearly synonymous with physiology in the sense in which that word has been for a long time employed, and therefore designating the science of life, rather than the description of the living beings in which it is manifested. But until a better or more comprehensive term be found, that of biology might be accepted under the general definition of "the science of life and of living beings," or as comprehending the history of the whole range of organic nature,—vegetable as well as animal.

He then gave a short sketch of the history of the section and of its division into subsections. He pointed out that although the great development of the knowledge of biology seemed to necessitate the increase of subdivision of labour, it was incumbent on all who were desirous of promoting the advance of biological knowledge, to combat the confined views which are apt to be engendered by the too great restriction of study to one department, and to secure at first, by a wider study of the general principles and some of the details of collateral branches of knowledge, that power of justly comparing and correlating facts which will mature the judgment and exclude partial views. After some remarks upon the subjects of anthropology, histology and embryology, Professor Thomson next treated of organic chemistry and vital force, as follows:—

The consideration of the finest discoverable structures of the organized parts of living bodies is intimately bound up with that of their chemical composition and properties. The progress which has been made in organic chemistry belongs not only to the knowledge of the composition of the constituents of organized bodies, but also to the manner in which that composition is chemically viewed. Its peculiar feature, especially as related to biological investigation, consists in the results of the introduction of the synthetic method of research, which has enabled the chemist to imitate or to form artificially a greater and greater number of the organic compounds. In 1828 the first of these substances was formed by Wöhler, by a synthetic process, as cyanate of ammonia, or urea. But still, at that time, though a few no doubt entertained juster views, the opinion generally prevailed among chemists and physiologists that there was some great and fundamental difference in the chemical phenomena and laws of organic and inorganic nature. Now, however, this supposed barrier has been in a great measure broken down and removed, and chemists, with almost one accord, regard the laws of combination of the elements as essentially the same in both classes of bodies, whatever differences may exist in actual composition, or in the reactions of organic bodies in the more complex and often obscure conditions of vitality, as compared with the simpler, and, on the whole, better-known phenomena of a chemical nature observed in the mineral kingdom. Thus, by the synthetic method, there have been formed among the simpler organic compounds a great number of alcohols, hydrocarbons and fatty acids. But the most remarkable example of the synthetic formation of an organic compound is that of the alkaloid conia, as recently obtained by Hugo Schiff by certain reactions from butyric aldehyd, itself an artificial product. The substance so formed, and its compounds, possess all the properties of the natural conia,—chemical, physical, and physiological,—being equally poisonous with it. The colouring-matter of madder, or alizarine, is another organic compound which has been formed by artificial processes. It is true that the organized or containing solid, either of vegetable or animal bodies, has not as yet yielded to the ingenuity of chemical artifice; nor, indeed, is the actual composition of one of the most important of these, albumen and its allies, fully known. But as chemists have only recently begun to discover the track by which they may be led to the synthesis of organic compounds, it is warrantable to hope that ere long cellulose and lignine may be formed; and, great as the difficulties with regard to the albuminoid compounds may at present appear, the synthetic formation of these is by no means to be despaired of, but, on the contrary, may with confidence be expected to crown their efforts. From all recent research, therefore, it appears to result that the general nature of the properties belonging to the products of animal and vegetable life, can no longer be regarded as different from those of minerals, in so far at least as they are the subject of chemical and physical investigation. The union of elements and their separation, whether occurring in an animal, a vegetable, or a mineral body, must be looked upon as dependent on innate powers or properties belonging to the elements themselves; and the phenomena of change of composition of organic bodies occurring in the living state are not the less chemical because they are different from those observed in inorganic nature. All chemical actions are liable to vary according to the conditions in which they occur, and many instances might be adduced of most remarkable variations of this kind, observed in the chemistry of dead bodies from very slight changes of electrical, calorific, mechanical and other conditions. But because the conditions of action or change are infinitely more complex and far less known in living bodies, it is not necessary to look upon the phenomena as essentially of a different kind, to have recourse to the hypothesis of vital affinities, and still less to shelter ourselves under the slim curtain of ignorance implied in the explanation of the most varied chemical changes by the influence of a vital principle.

Zoology and botany were the next subjects in the order of discussion, and were followed by some remarks on the teaching of natural science in schools. The speaker expressed his opinion that the introduction of instruction in natural science into the primary schools was feasible, and said that a mind which is entirely without scientific culture is but half prepared for the common purposes of modern life, and is entirely unqualified for forming an opinion upon some of the most difficult and yet most common and important questions of the day, affecting the interests of the whole community.

In conclusion, Professor Thomson adverted to the subject of spiritualism, an aspect in which he said it might be thought that the appreciation of biological science has taken a retrograde rather than an advanced position. In this he did not mean to refer to the special cultivators of biology in its scientific acceptation, but to the fact that there appears to have taken place of late a considerable increase in the number of persons who believe, or who imagine that they believe, in the class of phenomena which are now called spiritual, but which have been known since the exhibitions of Mesmer, and indeed, long before his time, under the most varied forms, as liable to occur in persons of an imaginative turn of mind and peculiar nervous susceptibility. He admitted that extremely curious and rare, and to those who are not acquainted with nervous phenomena, apparently marvellous phenomena, present themselves in peculiar states of the nervous system,—some of which states may be induced through the mind, and may be made more and more liable to recur, and are greatly exaggerated by frequent repetition. But making the fullest allowance for all these conditions, it is still surprising that persons, otherwise appearing to be within the bounds of sanity, should entertain a confirmed belief in the possibility of phenomena, which, while they are at variance with the best established physical laws, have never been brought under proof by the evidences of the senses, and are opposed to the dictates of sound judgment. He denied the truth of the assertion that scientific men have neglected or declined to investigate the phenomena with attention and candour. From time to time men of eminence, and fully competent, by their knowledge of biological phenomena, and their skill and accuracy in conducting scientific investigation, have made the most patient and careful examination of the evidence placed before them by the professional believers and practitioners of so-called magnetic, phreno-magnetic, electro-biological and spiritualistic phenomena; and the result has been uniformly the same in all cases, when they were permitted to secure conditions by which the reality of the phenomena, or the justice of their interpretation, could be tested,—viz., either that the experiments signally failed to educe the results professed, or that the experimenters were detected in the most shameless and determined impostures. The phenomena are in great part dependent upon natural principles of the human mind, placed, as it would appear, in dangerous alliance with certain tendencies of the nervous system. They ought not to be worked upon without the greatest caution, and they can only be fully understood by the accomplished physiologist who is also conversant with healthy and morbid psychology. The experience of the last hundred years tends to show that while there are always to be found persons peculiarly liable to exhibit the phenomena in question, there will also exist a certain number of minds prone to adopt a belief in the marvellous and striking in preference to that which is easily understood and patent to the senses; but it may be confidently expected that the diffusion of a fuller and more accurate knowledge of vital phenomena among the non-scientific classes of the community may lead to a juster appreciation of the phenomena in question, and a reduction of the number among them who are believers in scientific impossibilities.

Dr. B. W. Richardson read the ninth of a series of reports "On the Physiological Action of Organic Chemical Compounds." The series was commenced at Newcastle in 1863. The substances described in the present report were chloral hydrate, anhydrous chloral, metachloral, bromal hydrate, nitrite of amyl, nitrate of ethyl, sulpho-urea, and hydride of amyl, called briefly hydramyl. He considered the question of what was a dangerous, and what a fatal dose of chloral hydrate, fixing the maximum dose at 140 grains. He stated that, in instances where chloral hydrate was producing dangerous symptoms, threatening to be fatal, warmth, food and artificial respiration were the great remedies; and he explained the dangers that were arising in the community from the practice of taking chloral hydrate as a narcotic luxury, like alcohol or opium. He strongly warned people against this practice, and stated that the *habitué* to this influence became a diseased person, and sometimes an unintentional suicide. Of nitrite of amyl the author mainly tried to show the action on the lungs; it caused paralysis of the blood-vessels, and produced congestion, and in the lungs changes were brought about analogous to some of those attending pulmonary consumption in the human subject. On the other hand, it produced a curative effect in certain diseases. The last substance named was chlor-hydramyl, a light, volatile fluid, intended to produce rapid insensibility to pain in short operations.—A brief discussion followed, in which Drs. Donkin, Marcet, Sharpey and Brunton took part.

Professor Balfour submitted some observations on the cultivation of ipecacuanha in the Edinburgh Botanical Gardens for transmission to India. A short time ago Mr. James M'Nab, of the Botanical Gardens, had discovered that by cutting the root of the plant under the ground surface, numerous new shoots could be got, and the plant so propagated much more easily and plentifully. They had thus been able to send out a number of healthy plants to India, which it was hoped would be there equally successfully cultivated.

Parliamentary and Law Proceedings.

Action against a Medical Practitioner for Negligence.

TROTTER v. DOWNES.

An action for damages against a medical practitioner was tried at the recent Croydon Assizes before Mr. Baron Bramwell.

It appeared that Mr. Downes, the defendant in the case, is a medical practitioner residing in Southwark. He has three assistants, two of them being pupil assistants and one senior. On the 5th of June last, the plaintiff, a working woman, called at his shop, and asked one of the junior assistants, as she said, for "Rochelle salts," but, as he said, for "Rochter salts," for which he gave her carbonate of potash or salts of tartar. According to his evidence, he gave her only half an ounce, and there were no questions asked nor directions given as to the mode or quantity in which it should be taken. The woman said that she took a spoonful of it in water, and it caused her violent vomiting and great pain. There was no doubt that it did for the time cause great depression and prostration, but according to the medical evidence, it caused her no serious injury. A day or two after she went to Mr. Downes, the defendant, and declared she had suffered severely, and claimed compensation. Mr. Downes said he could see no symptoms of injury, and that, as she had thrown it off, it could do her no further harm, and that he would give her some medicine to counteract it. Soon afterwards, however, an attorney's clerk, who lodged in her house, came to Mr. Downes to claim compensation. Mr. Downes said, if he found she had sustained any damage, he would compensate her; and subsequently, in order to avoid the vexation of an action, offered to pay as much as £40 or £50, but in vain. A writ was issued and an action brought. It appeared that the attorney's clerk entertained sanguine expectations of the fruits of the action, and even the sum of £200 was mentioned as the probable amount of damages. The woman gave evidence as a witness, and was supported by her daughter. According to her story she had been quite laid up; there were serious symptoms, and even paralysis spoken of as imminent. For the defence medical witnesses who had examined the woman were called, and their evidence showed that there was no real injury.

After a long trial the learned Baron in summing up said, if the assistant had understood the woman as asking for Rochelle salts, and had given her the carbonate of potash for it, or if he had not taken care to ascertain what it was she wanted, the defendant would be liable; but if he gave her what she asked for, then, as she did not ask for directions about its use (though it would have been better to have given them), the defendant was not liable. Even, however, though the jury found for the plaintiff, there would remain the question of damages, as to which the learned judge observed there were many circumstances which required consideration; the case must be looked at as a whole; and there was strong evidence of undoubted witnesses that the woman had sustained no real injury at all. Moreover, there was great reason to suspect that it was the attorney's clerk, rather than the woman, who was interested in the action.

The jury, after a brief consultation, gave a verdict for the plaintiff for one farthing.—*Clerkenwell News.*

Alleged Attempt to Poison by a Lady.

At Brighton, on Friday, August 18, Christiana Edmunds was charged before the magistrates, with attempting to administer poison to Emily Beard, with intent to commit murder.

It was stated that recently parcels containing poisoned cakes had been sent to several private families in the town. In each case the parcel was forwarded anonymously and was prepaid; the contents were generally similar, and the handwriting appeared the same. Among the persons who said that they had received such parcels was the prisoner. A reward was offered for the detection of the offender, and eventually the prisoner was apprehended. The accused is the lady who, at the inquiry into the cause of death of a boy after eating some chocolate creams,* deposed that she had been made ill by eating creams purchased at the same shop, and had consequently had them analysed, when they were found to contain poison.

Mrs. Emily Beard, wife of Dr. Beard, deposed that on Thursday in the previous week she had received a parcel by rail, which upon opening she found to contain some cakes, preserved fruits and gingerbread nuts, and a note saying that the cakes were for the children, but that some packed up separately were flavoured for herself. She believed that one cake was wrapped up in the note itself. On cutting it through, she noticed something white in the middle which looked like unbaked flour. She sent it all away by the servant, and afterwards two of the servants, Emily Haggett and Margaret Knight, were taken ill. She had known the accused five or six years. About a year ago while visiting her, Miss Edmunds had taken some chocolate creams from her pocket, saying she had brought them for the children, and placed one in witness's mouth. It had a very unpleasant, cold, metallic flavour, and witness went out of the room and spat the whole of it out, but notwithstanding saliva continued to run from her mouth the whole of the night, and she was unwell from diarrhœa the next day.

Dr. Beard said that he had received several letters from the prisoner, one of which was afterwards read. It contained several allusions to the analysis she had obtained, and the evidence given by her at the inquest. Dr. Beard said the prisoner had been in the habit of writing to him for about a year. He had told the prisoner that she must not continue to do so. In consequence of the prisoner expressing a wish that the intimacy with his family, which had been broken off after the chocolate affair, should be renewed, he had objected, on the ground that he feared she had attempted to poison his wife. This charge, however, under threat of an action, he had been obliged to withdraw, because he felt he could prove nothing, and he knew his wife would be on her guard.

Isaac Garrett said: I am a chemist carrying on business in the Queen's Road. On the 8th of June a boy brought to me the following note in a sealed envelope:—

"Messrs. Glaisyer and Kemp will be much obliged if Mr. Garrett could supply them with a little strychnia. They are in immediate want of half an ounce, or if not able a smaller quantity will do. Will Mr. Garrett send it in a bottle and sealed up. The bearer can be safely trusted with it.

"Glaisyer and Kemp, 11, 12, North Street."

I questioned the boy, but refused to send the strychnia without an order from the firm. I also told him I could not supply them with the quantity they required, as I only had a drachm. The boy returned within an hour, with the following order sealed up in an envelope, in which 2*s*. 6*d*. was enclosed to pay for the strychnia:—

"Messrs. Glaisyer and Kemp will be quite satisfied with a drachm of strychnia till their own arrives, and thank Mr. Garrett for supplying them. Their signature has always been sufficient before in their business transactions. Should Mr. Garrett feel the least hesitation in supplying them, they must apply elsewhere.

"Glaisyer and Kemp, 11 and 12, North Street."

Accompanying this was the following order:—

"One drachm strychnia, for Glaisyer and Kemp, Chemists, 11 and 12, North Street, June 8th, 71."

I thereupon put the strychnia into a small bottle, sealed the cork down, labelled it "poison," addressed it to Messrs. Glaisyer and Kemp, and gave it to the boy. The 1*s*. 3*d*. change I wrapped up with the bottle.

Two or three days previous to the 19th of July I received the following letter, contained in a sealed envelope. It was not brought by the same boy who came with the note purporting to come from Messrs. Glaisyer and Kemp:—

"*Ship Street, July*, 1871.

"Sir,—I shall be much obliged if you will allow me the loan of the book wherein you register the poisonous drugs you sell. It is merely in furtherance of an inquiry I am making as to the sale of certain poisons, and bears no reference to anything you have sold or any irregularity in the selling, but only to aid me in my investigation. You will tie up your book and send it at once by

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* See *ante*, p. 17.

the bearer; it shall be returned to you soon, as you may need it. Yours truly, D. Black, Borough Coroner."

I sent the book by the boy, and it was returned within an hour, wrapped up in the same paper. Subsequently Dr. Brown called upon me and desired to see the book. I then discovered that several of the leaves were missing. The missing part did not contain the entry relating to the strychnia had by Messrs. Glaisyer and Kemp; they related to business transactions about six months since. The book was perfect when it was fetched by the boy; it had not been out of my possession before. Two or three days afterwards I received the subjoined note, also contained in a sealed envelope, and brought by another boy. A shilling was enclosed in it:—

"Messrs. Glaisyer and Kemp will be much obliged if Mr. Garrett could supply them with 2 oz. of arsenic, or 3 oz. if he can. So please send back directly. Their signature will be sufficient.

"Glaisyer and Kemp, North Street, July 19th."

I did not supply this article, for my suspicions began to be aroused. I thought it singular that Messrs. Glaisyer and Kemp should send such trifling orders. I wrote a note to that effect and sent it by the boy, but received no answer to it. The next morning I went to Messrs. Glaisyer and Kemp's, and in consequence of what occurred on that occasion, I went to the Town Hall and gave information to the police.

Thomas Glaisyer said: I am a member of the firm of Glaisyer and Kemp, 11 and 12, North Street, Brighton. I have looked at the letters spoken to by Mr. Garrett, purporting to come from my firm, and can affirm that they were not written by any one connected with our establishment. We have not received the strychnia referred to, nor the letter which Mr. Garrett wrote to us.

Nathaniel Paine Blaker, surgeon, said: I was sent for on Saturday evening last, at about half-past seven or eight o'clock, to Dr. Beard's, to attend Margaret Knight. She complained of a pain in her stomach and of vomiting. I was told she had been vomiting almost the whole of the afternoon. From the symptoms which showed themselves, and in consequence of what was told me, and of subsequent observations of her symptoms, I can only account for them as the result of some irritant poison. Some vomit was shown me in two vessels. One contained that which she threw up soon after she was taken ill, and the other that which she brought up when I was called to attend her. These vessels I had placed into a cupboard, together with the other cakes contained in the box, and then sealed up the cupboard. Nothing has been done with the vomit since, to my knowledge. Arsenic might produce such symptoms, but I would not swear to it. The cook was not so ill as Knight. She told me she felt languid, and had a pain in her stomach, but there was nothing much in her appearance to attract attention.

The hearing of the case was adjourned. It has been decided to entrust the analysis to Dr. Letheby. A reward having been offered for each of the three boys who were sent with notes to Mr. Garrett, two of them have been already found.

Poisoning by Laudanum.

At the Clerkenwell Police Court, on Tuesday, Rosina Hamilton, a needlewoman, was charged with attempting to poison her two illegitimate children by administering laudanum.

A policeman stated that on the previous evening the prisoner came into the police station and said she had come to give herself up for poisoning her two children. He fetched a medical man and went to her house, where he found the children in an insensible state, and on the table a small milkjug and spoon, both of which had contained laudanum. The prisoner gave him a bottle which smelt strongly of laudanum, and said, "I gave them two pennyworth of laudanum. I bought one pennyworth in the Caledonian Road, but I do not know where I got the other. I tried to get it at a number of shops, but they refused to serve me."

Medical evidence was given that the children were suffering from opium-poisoning, and that though now likely to recover, they would probably have died had they not received prompt medical treatment.

The prisoner was remanded.

Poisoning by Oil of Vitriol.

On Wednesday evening an inquest was held at Upper Norwood, touching the death of John Burman Messenger, aged eight years. The deceased was the son of a fruiterer residing at 3, Chatham Terrace, Upper Norwood. The father was accustomed to clean the shop scales with vitriol, and on Friday last sent one of his errand boys to purchase a pennyworth. He shortly afterwards left, and on his return found that two pairs of scales had been cleaned. The vitriol was in a ginger-beer bottle. He sold ginger-beer. Witness found deceased suffering acutely, complaining of great pain in his chest. He was taken to Dr. Brockwell, who pronounced it a case of poisoning by sulphuric acid. He was then taken home, and expired the following day. The children were in the habit of helping themselves to the ginger-beer. He had no doubt the bottle containing the poison had by some inadvertence got mixed with the other bottles on the counter, and the deceased had drunk a portion. Verdict—Accidentally poisoned.—*Standard.*

Review.

Commentar zur oesterreichischen Pharmacopoe. By Dr. J. C. Schneider and Dr. A. Vogl.

Second Notice.

The special part of pharmacognosy opens with Class I., remedies which are directly recognized as plants or parts of plants; these are divided into two sections, viz. Thallophytica and Cormophytica, the first comprising three Orders, (1) Fungi, (2) Lichens, (3) Algæ; the last nine Orders, (4) Herbæ, (5) Folia, (6) Gemmæ, (7) Flores, (8) Fructus, (9) Semina, (10) Cortices, Stipites et Ligna, (11) Radices, Rhizomata, Tubera et Bulbi, (12) Gallæ.

The names of the single articles under these Orders are given in Latin, German, French and English, and with very few exceptions, these names are given correctly.

The authors expressly state they have not limited themselves to a description of substances embodied in the Austrian Pharmacopœia, but they have included many antiquated remedies still in request, and also new articles which are likely to become important in pharmacy and medicine. A clear distinction in the type of the headings separates at once the officinal from the non-officinal remedies.

Each of the twelve Orders is prefaced by a description of the general characteristics, botanical, chemical, physical, or microscopical, and we shall take opportunity of reporting on some of these prefaces in due time.

Under *Fungi*, the most important and the first on the list, is—

Fungus secalis. Secale cereale, Linn. *Ergot of Rye.*

It chiefly consists of a dirty-white tissue, enclosed in a thin dark violet skin; it contains 31 per cent. of a colourless fatty oil in small globules, soluble in ether, chloroform and boiling alcohol. Wenzell separated in 1864 two alkaloids from ergot, viz. ecboline and ergotine, combined with ergotic acid. The specific action of ergot appears to be due to ecboline, inasmuch as half a grain was found to be as powerful as 20 grains of ergot; ergotine is less active. Wenzell also proved the presence of phosphate of trimethylamin, which, on addition of potash, gives the peculiar smell of herrings.

A large percentage of ergot in corn flour is highly dangerous, and has often been the cause of epidemics (ignis sacer, pestis ignaria), especially in France, also in Brabant, Germany, Italy and Sweden. The detection of ergot in flour is therefore of the utmost importance. The most delicate test is a mixture of one part of sulphuric acid and ten parts of alcohol, which dissolves the colouring matter, producing a beautiful red colour; the specific smell of trimethylamin, on addition of potash, is also decisive; and lastly, the treatment with bisulphide of carbon, which extracts the fatty oil, of which pure flour contains but traces.

Herbæ.

A useful hint is given how to prepare dried herbs for microscopic investigation, so as to give them the required elasticity, viz. to place them for a couple of hours on moistened sand under a bell jar.

Herba Cannabis indicæ. Cannabis sativa, L. *Indian Hemp.*

The hemp cultivated in Europe, on account of its tough bark-fibre and oil, differs but slightly in botanical characteristics from that grown in Asia and Africa, and the more drastic action of the bark is entirely due to climatic influences. There are two varieties of Indian hemp. Gunjah or Ganja, from the mountains of northern India, is of superior quality, but more scarce than Bang or Guaza. Very little is known of the active principles of Indian hemp, the resin and essential oil obtained from the plants appear to be the joint cause of the narcotic action. The resin, cannabine, or hadshischine, has not yet been analysed; it is extremely bitter, soluble in the usual solvents of resins, but not in alkalies: the essential oil, according to Personne, consists of a liquid, cannabene $C_{36}H_{20}$, and a crystalline substance, cannabene hydride $C_{36}H_{42}$. Liford and Martius found oxygen in the oil.

Herba Maticæ. Artanthe elongata, Miq. *Matico leaves.*

The active principles are a resin, an essential oil and tannin. The essential oil is contained in separate large globular cells with thin walls, which are dispersed in the microphyll, but chiefly under the epidermis of the upper side of the leaf; tannin is found in all microphyll cells, besides chlorophyll; sections of the leaf are coloured blackish-green by solution of iron salts.

Another variety, *Artanthe adunca*, Miq., has been imported more recently from South America; the leaves of the last are not serrated, they are underneath rough, stiff, almost leathery, the tertiary nerves project but little, and connect the secondary nerves without forming meshes. The inhabitants of South and Central America designate as matico several herbs which are known as styptics. It is reported that this specific property was accidentally discovered by a Spanish soldier during the War of Independence from Spanish supremacy, who, in default of other means, bound up his wounds with matico leaves; hence the name *Yerva soldado* or *Palo del soldado.*

Herba Absinthii. Artemisia Absinthium, L. *Wormwood.*

Yields from a half to two per cent. of essential oil, contained in separate round glands in all the herbaceous parts of the plants, chiefly in the leaves. Soil and climate exert the greatest influence upon the quality of wormwood; the plant which grows wild in sunny, stony places is the best, whereas if cultivated in gardens it loses much of its medicinal value.

Herba Spilanthis oleraceæ. Spilanthes oleracea, Jacq. *Paraguay Roux.*

Microscopic examination shows in the texture of the leaves, in the barks of the stalks, besides chlorophyll in most of the parenchyma cells, colourless oil-globules, which turn reddish-brown on addition of solution of iodine. In South America, its native country, Paraguay roux, or para creso, has long been known as an antiscorbutic; the tincture made from fresh leaves is officinal in Germany, and is used for toothache.

Herba Galeopsidis. Galeopsis ochroleuca, Lamarck.

This herb has long been used in Germany and France as a popular specific in diseases of the chest; it gained great popularity in 1811, when it was found to be the principal ingredient of a quack medicine, known as Lieber's herbs for consumption: it was received into most Pharmacopœias, chiefly to counteract the Lieber swindle, and although perhaps harmless and useless, it still enjoys a certain popularity.

Herba Lobeliæ. Lobelia inflata, Linn. *Indian tobacco.*

It tastes disagreeably sharp and irritating, resembling that of tobacco, hence its English name; the fresh plant is replete with a white, very acrid chyle, distributed in netlike vessels through all its parts; this is undoubtedly the agent of the medicinal activity, although it is not yet known. The active principle, according to Calhoun, is a volatile narcotic alkaloid, called lobeline, similar to nicotine, combined with lobelic acid; besides this, there has been found in the herb a resin, a gum and traces of an essential oil, and in the seed 30 per cent. of a rapidly drying fatty oil.

Herba Aconiti. Aconitum Napellus, Linn. *Aconite leaves.*

Most Pharmacopœias demand the wild-growing plant for the extract, the only exception is the British Pharmacopœia, which prescribes the cultivated plant.

Herba Cochleariæ. Cochlearia officinalis, Linn. *Scurvy grass.*

The fresh herb on being rubbed developes a pungent, volatile smell, resembling mustard oil; the dried herb has entirely lost its pungency. The fresh, blooming herb yields not more than from 0·02 to 0·05 per cent. of an essential oil ($C_{12}H_{10}S_2O_3$, Geissler), this is not ready-formed in the plant, but is produced by the action of a substance similar to, perhaps identical with, myrosine of the mustard seed. The activity of this substance is destroyed by drying the plant; dried scurvy-grass treated with myrosine yields the essential oil, but not by itself. This oil forms with ammonia, like mustard oil, a crystalline base. The officinal spiritus cochleariæ sometimes deposits crystalline needles of the composition $C_{12}H_{14}O_4$, often also sulphur crystals. The spirit was first used as an anti-scorbutic by Weir, as far back as 1557.

Notes and Queries.

*** *In order to facilitate reference, correspondents are requested to mark their answers in each case with the title and number of the query referred to.*

No notice can be taken of anonymous communications. All queries or answers should be accompanied by the name and address of the writer.

[276.]—AERATED WATERS.—*W. H.* wishes to have a recipe for making gingerade, lemonade, or soda-water with a machine.

[277.]—GOLDEN HAIR DYE.—"*Crinis*" asks for a receipt for a golden hair dye that will not injure the skin.

[278.]—HOT-AIR BATH.—Perhaps some reader would kindly inform me of the best plan of constructing a hot-air bath for drying large quantities of a certain paste; as it has to be thinly spread, a large surface is required. A uniform low temperature, without constant watching, is also an object?—NUBES.

[279.]—ESSENCE OF BAYONNE.—Can any reader inform me of the nature of a substance called essence of bayonne, and where it is to be procured?—J. J. THOMAS.

[280.]—DISPENSING.—The following prescriptions have been handed to me to prepare; I would like to hear the opinion of some of the readers of the Journal on them:—

℞. Potass. Hydr. ʒiij
Aquæ ℥viij M.
Sig. coch. mag. ter in die.

℞. Beberiæ Sulph. ℈ij
Acid Nit. Dil. ʒij
Aquæ ad ℥ij Solve.
Sig. coch. min. ter in die. —George Harvie.

[281.]—DISPENSING.—Will some of your correspondents inform me of the best way to dispense the following prescription:—

℞ Kreasoti gutt. iij
Zinci Oxydi gr. iij
Mucil. Acaciæ q.s.
ut fiat pilula, ter die post cibos sumenda.
Mitte xxiv
in argento.

It has been dispensed previously, but I have experienced great difficulty in turning out a nice pill.—W. P. Parry.

[282.]—DISPENSING.—I have just dispensed the following prescription, which presented a thick appearance, but no doubt the mixture is intended to be clear.

Can any reader kindly inform me the best mode of manipulation?

℞ Potass. Bromid. ʒiv
Spt. Ammon. Arom. ℥j
Spt. Chloroformi ʒiv
Syr. Aurantii ℥j
M. Inf. Aurantii ℥iiss. —Aquila.

[283.]—BROMIDE OF QUININE, BROMIDE OF STRYCHNINE, AND BROMIDE OF MORPHINE.—"*A Glasgow Chemist*" will feel obliged for some particulars regarding the preparation, strength, dose, etc., of these articles.

[284.]—SYRUP OF CHLORAL HYDRATE.—A few days ago, I had a prescription brought to me, of which the enclosed is a copy.

℞ Syrup. Hydrat. Chloral, ℥ij.
Half to one teaspoonful to be taken at bedtime in half a wineglass of cold water when required to procure sleep. —J. W.

I was told that a child of ten years was going to take it. What strength ought it to have been made? Is there a regular form by which medical men take their standard, the same as they do in B. P. preparations? Had it been for an adult to take, of course the strength would have to have been stronger than for a child. If any reader can enlighten me on this subject, I shall be obliged.—"Exhibeatur."

CARBOLIC ACID FOR SNAKE BITES.—We learn from the *Journal de Méd. de l'Ouest*, and *Bull. Génér. de Thér.* that Dr. Weir Mitchell, from observations on the bite of the rattlesnake, and MM. Gicquain and Viaud Grand-Marais, from observations on that of the viper, have arrived at the conclusion that the application of carbolic acid immediately on the receipt of the injury prevents both local and general poisoning. The pure acid, however, if applied in too great quantity, is liable to produce sloughing, and even dangerous symptoms; hence it is best used in the proportion of two parts of acid and one of alcohol. Given internally, or applied to the wound at a late period, it produces no effect. It is believed to act, not by neutralizing the poi son, but by causing contraction of the small vessels, and thus preventing its absorption.—*Nature*.

The following journals have been received:—The 'British Medical Journal,' Aug. 19; the 'Medical Times and Gazette,' Aug. 19; the 'Lancet,' Aug. 19; the 'Medical Press and Circular,' Aug. 18; 'Nature,' Aug. 17; the 'Chemical News,' Aug. 19; 'Gardeners' Chronicle,' Aug. 19; the 'Journal of the Society of Arts,' Aug. 19; the 'Grocer,' Aug. 19; 'Produce Markets Review,' Aug. 19; the 'English Mechanic,' Aug. 18; the 'Chemists and Druggists' Advocate,' Aug. 20; the 'Clerkenwell News,' Aug. 15; the 'Croydon Chronicle,' Aug. 9; the 'Brighton Daily News,' Aug. 19.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

The Pharmacy Bill.

Sir,—In the Journal for August 5th you insert two paragraphs from "the Report recently made by the Medical Officer to the Lords of Her Majesty's Privy Council." I regret that you have not published the whole of that Report, as its publication might probably have had the effect of stirring up every member of the trade to keep a very vigilant eye on the doings of that medical officer. However, the two paragraphs you have published contain quite sufficient to make every member of the trade keep a strict guard for the future, to prevent and to defeat any other amended Pharmacy Bill of so objectionable a character as the one which has been defeated in the present session of Parliament.

I do not agree with Mr. Simon in his belief that it was "an accidental oversight in legislation in the Pharmacy Act of 1868, that while all other powers were to be exercised for public purposes by the Council of the Pharmaceutical Society, the first section of that Act vested in the commonalty, and not in the Council, the very important power which that section confers." I feel persuaded that the twelve thousand chemists of this country will never submit, without a much greater struggle than they have now passed through, to permit either the Privy Council with its medical officer, or the Council of the Pharmaceutical Society, to make such rules as they may think proper for the conducting of the business of a chemist and druggist, without first submitting them for the approbation of the members of the Society. His Report is not a correct, but a very unfair, statement as to the selling of poisons, as the Act itself contains the most stringent regulations as to the sale of them. Any member of the Privy Council who is unacquainted with the Pharmacy Acts of 1852 and 1868 would be led to believe there were no rules or regulations in existence as to the sale of poisons.

The first section of the Pharmacy Act of 1868, which vests in the Pharmaceutical Society (with the consent of the Privy Council) to recommend regulations as to the keeping, dispensing and storing of poisons, is one entirely of a permissive character, to be used only if circumstances should arise to require them. I assert that no case has been made out, that the public have never asked for, and that circumstances have not arisen to justify the Government in, such a needless piece of interference with the business of probably twelve thousand chemists and druggists in the kingdom.

In proof of what I say, I point with proud satisfaction to the fact that the deaths from accidental poisoning, from errors in dispensing, do not amount to two per annum on the average of many years. I very much doubt whether any rules or regulations could be framed which would lessen that number; but those who know the business, and are capable of judging, feel that if left to the Privy Council, not one of whom knows anything about the business of a chemist and druggist, they might make such rules and regulations for "the storing of poisons" as would be very likely to largely increase the number of cases of accidental poisoning.

I also assert that the public have never asked for the alteration of the Pharmacy Act of 1868. I have never seen in any newspaper either a letter or a leading article asking the Government to undertake such a needless piece of legislation. The business with which I am connected has been in existence nearly a century, and during that long period, as far as I can ascertain, there has never been a single case of accidental poisoning, or anything approaching a serious mistake.

No penalties which the Government could devise in cases of accidental poisoning could equal that which invariably follows such cases, namely the utter ruin of a man's business. It is to the interest of every member of the trade to make such rules and regulations for the prevention of accidents as the very varying circumstances of a chemist's business require. The regulations which are adapted to a town business are quite unsuitable for a business in an agricultural district.

I hope every town in the kingdom will organize, and be prepared for the assault on the trade which will probably be made next session; and also consider well who are to be returned to the next Council to represent their interests.

If the Government are anxious to make an alteration in the law, the best alteration they could make would be to bring in an Act to separate entirely the practice of pharmacy from the practice of medicine,—that is, that all medicines shall be prepared and dispensed by educated chemists, and that the prescribing of remedies and the art of surgery shall be confined entirely to medical men.

If the Council of the Pharmaceutical Society were to devote more of their time and of their funds to establish provincial schools of pharmacy, to improve the education and status of the country members, their time and their means would be better employed than they hitherto have been. The country members contribute a very large proportion of the income of the Society, and a very small amount has been expended for the benefit of Pharmacy in the provinces. Neither have the country members been indifferent to the claims of the Benevolent Fund, if other towns have contributed in the same proportion as Hull has. I trust the Council, for the future, will endeavour to promote harmony between town and country, and that they will also have the pluck to refuse to be dictated to or led by the nose by any medical man. The education which the present generation of chemists must receive, and the examinations which they must pass, ought to protect them from such interference, and fit them to make suitable rules for the management of their business.

Atkinson Pickering.

Hull, August 14th, 1871.

Sir,—I have but this day returned home, having spent the last fortnight in regions inaccessible even to the Pharmaceutical Journal. I have thus but just seen Mr. Sandford's letter in the impression of the 5th inst., and I have thus also lost the proper moment for replying to an opponent's letter. There are, however, two points in it to which I wish to refer, even though somewhat after date.

Mr. Sandford asks the question, "Does not Mr. Schacht know that even in his own district a score of persons dealing in poisons may be found who take no precaution whatever?" To this I wish to answer that I do *not* know it, and that I should like to be informed if Mr. Sandford knows it, or upon what authority he makes the insinuation.

In another part of his letter Mr. Sandford refers to my charge of "treason" against certain "good men and true," who he hopes "will still command the confidence and goodwill of their fellow-members." To this I wish to say that as regards "goodwill," no one is more sincerely capable of endorsing Mr. Sandford's hopes than myself. My charge is exclusively a political charge. I have no doubt many of those whose conduct in this matter appears to me to be "treasonable" believe themselves to be patriots, and all such men have my personal good-will, now as ever, though, for the time at least, they have utterly lost my political confidence.

Only one word more. I regret this controversy as much as any one, but I refuse to accept the responsibility of the agitation. They are responsible who seek to impose a law upon the trade, five-sixths of which (as Mr. Betty shows) appear to be opposed to it. Under such circumstances agitation must follow, and, as it seems to me, must continue so long as the threat to persevere in the attempt is continued, and so long as it is human nature that five men should decline to lie down and allow one man to walk over their bodies.

G. F. Schacht.

Clifton, August 17th, 1871.

Plans for the Prevention of Accidental Poisoning.

Sir,—Week after week we are continually reading some new suggestion with regard to the above, until at last, from their multiplicity, they are becoming positively sickening; and more than this, they have a bad influence on the "rising generation" of pharmaceutists, because they tend to make us lose confidence in ourselves. What may be the use of the examinations of the Pharmaceutical Society if they are not to get a superior class of men into the trade, men who fully appreciate and feel the responsibility of their situation? and what may be the use of mechanical aid to men of this class? I never see a suggestion for the prevention of accidental poisoning but that I feel thankful that the general public do not get access to our trade journals and see all these "bright ideas" for the prevention of poisoning, for they would most certainly think we were all "losing our heads."

Sometimes I almost fancy that your correspondents must be joking when they propose such things as bells or galvanic apparatus to be attached to the bottles, for they could never have thought on the practicability of the schemes they suggested, if they did I am pretty sure they would never have recommended them.

I don't believe that any mechanical arrangement that may be invented will be any sort of a safeguard after the novelty of the affair has worn away. For instance, supposing something was adopted which was intended to attract your notice by sound? What would be the result? Why, simply the same as taking up your abode near a railway station,—for the first few nights you cannot sleep with the noise, but soon you get used to it, until at length that very noise acts as a sort of lullaby, and you would find it hard to go to sleep without it. And so it would be with anything in the way of sound that could be adopted,—it would in time attract no notice whatever. And the same rule would apply if we trusted to the sense of touch, or any other sense, except the eye and the brain. I am sure it is quite time to say "good-bye" to all these absurd suggestions, or else we shall be running our heads against a post, if we have not done so already. What a true fable is that of the frogs who cried out for a king! Every one knows the result of their pleadings; and if our trade at present does not bear a close resemblance to the frogs, nothing in this changeable world ever did. We cried out for government; we have obtained it in the Pharmaceutical Society. Yet still we are not happy. We are grumbling again, and if we don't mind we shall get fettered by a government of another sort; and who knows what the result would then be? We have narrowly escaped this latter predicament, and, unless some agreement is made between ourselves before next session commences, why then look out for storms, for we shall then surely find ourselves "out of the frying-pan into the fire."

C. B. A.

Penzance, August 22nd, 1871.

Poison Bottles.

Sir,—Your correspondent "Scotus," in my opinion, just adds another difficulty in place of removing one, in regard to the keeping of poison bottles. The expense necessary to purchase several dozens of bayonet-catch stoppered bottles would prove an insuperable objection to many hundreds in the trade.

In regard to the india-rubber capsules he is mistaken as to the necessity to use both hands. Although I deprecate the haste he alludes to in dispensing prescriptions, and would always prefer the dispensers in my pharmacy placing bottles containing dangerous drugs fairly on the counter before them; yet if it is imperative to dispense against time, let the rubber cap be fixed to the stopper, by wrapping a bit of coarse adhesive rubber tape round the stopper, and allow the lower edge or ring of the cap to rest on the rim of the bottle, in place of over it, when the stopper can be as easily removed and replaced with one hand as any stopper not so protected.

M. P. S.

X. Y. Z. is recommended to communicate with the Registrar.

"*Theta*" writes to us, urging the Council to permit "Modified men," on passing the local Preliminary examination, the same privilege of presenting themselves for the Major examination as though they had passed the Minor. He had better make that application to the Council; we cannot see that we should aid his views by publishing his letter.

Communications, Letters, etc., have been received from Mr. P. Miller, Mr. F. Pattison, Mr. R. Carter Moffat, Mr. S. H. D. Sheppard, Mr. Crafton, Mr. Bingley, Mr. J. Parrott, W. D. S., C. B. A., A. A., "Sulphur," "Aquila."

VESICATING INSECTS.

BY M. C. COOKE, M.A.

(*Continued from page 142.*)

Part III. European and African Mylabridæ.

Having already enumerated the Asiatic species, more or less economized as vesicants, it remains to give some account of the European and African species. Of the 275 species already known, at least 160 are African, so that Africa may be regarded as the head-quarters of the genus, but we are very deficient of information as to the extent to which any of them are employed as vesicants. Only three species have been recorded in the New World, one of these is certainly a *Lytta*, and both the others are very doubtful. It is probable that no true *Mylabris* is found in America.

Floral Mylabris, *Mylabris floralis*, Pall.; hairy, black; elytra blue-black, with two yellow bands, and two spots, of which one is at the base, the other at the apex.—Pall. Icon. t. H. f. e. 8; Schæff. Icon. t. 151. f. 3. *Mylabris Füsselini*, Biz. Fn. G. xxx. 18; Bellb. Mon. t. ii. f. 12, 13. *M. variabilis*, Tausch. Mem. Mosc. iii. t. 10. f. 5. *M. fasciatus*, Füssel. Verz. p. 20. 398. t. i. f. 1 *c*.

Head hairy, black, punctate. Thorax scarcely longer than broad, black with black hairs, punctate. Scutellum black, hairy, punctate. Elytra three times as long as broad, rugoso-punctate, bands and spots evidently punctate, with scarcely the rudiments of elevated longitudinal lines, subvillous, hairs at the base longer and blue-black; a solitary spot by the scutellum, two dentate, wavy bands, one above, the other below the middle, and one spot at the apex; all the bands and spots yellow. Wings hyaline, tawny. Breast and abdomen rugoso-punctate, black, rather shining, hairy. Feet black, hairy.

Native of Germany, Switzerland and other parts of Europe.

It is stated in Christison's 'Dispensatory,' and some other works, that this is employed as a vesicant in some parts of Europe, under the name of *Mylabris Füsselini*.

Twelve-spot Mylabris, *Mylabris duodecimpunctata*, Oliv.; hairy, black; elytra brick-red, with six black points in pairs.—Tausch. Mem. Mosc. iii. t. 10. f. 10; Oliv. Ency. Meth. *Mylabris crocata*, Oliv. Ent. iii. t. 2. f 23; Billb. Mon. t. 7. f. 8. *M. cyanescens*, Illig. *Meloe crocata*, Pall. Icon. p. 87. t. E. *Lytta lutea*, Pall. Iter. p. 222.

Head hairy, black, punctate. Thorax a little longer than broad, hairy, black, punctate. Scutellum black. Elytra three times as long as broad, rugose, marginate, with scarce the rudiments of elevated lines, yellowish, with six black points in pairs, of which two are before the middle, two about the middle, the fifth behind the middle, at the suture, and the sixth near the apex. Breast and abdomen black, hairy, punctate. Feet black, hairy.

Native of Hungary, Russia, France, etc.

This species is misquoted by Moquin-Tandon (Med. Zool. p. 135) as *M. cyanescens*, where it is stated to have been recommended by M. Farines, a pharmaceutist of Perpignan. In Gemminger and Herold's Catalogue, doubtless on the authority of Marseul, the *M. cyanescens* of Illiger is quoted as synonymous with the *M. crocata* and the *M. duodecimpunctata* of Olivier.

Variable Mylabris, *Mylabris variabilis*, Pall.; villous; black; elytra shining black, with three ochraceous bands, the first interrupted, and the upper margin coloured.—Pall. Ic. p. 81. t. E. f. 7; Oliv. iii. p. 10. t. 2. f. 14 *b*; Billb. Mon. t. 3. f. 3. *Meloe fasciatus*, Füssel. Verz. p. 20. T. f. 1 *c*.

Head black, hairy, punctate. Thorax scarcely longer than broad, black. Scutellum black, hairy. Elytra three times as long as broad, shining black, somewhat hairy, hairs very short and black, with three ochraceous bands, the first at the shoulder interrupted, the second and third waved, the black apex also broad with the margin yellowish or ochraceous, roughly punctate, with four elevated longitudinal lines. Wings hyaline, tawny at the apex. Breast and abdomen black, punctate, hairy. Feet black, hairy.

Native of Russia, Germany, and Switzerland. Included by Moquin-Tandon with vesicants on the authority of Dr. Bretonneau (Annales des Sc. Nat. xiii. 1828. p. 78).

Spotted Mylabris, *Mylabris maculata*, Oliv.; black; elytra rufous, with two black spots at the base, and posteriorly two broad, black, somewhat interrupted bands.—Oliv. Ent. iii. 47. t. i. f. 9; Billb. Mon. t. 6. f. 10–14; Tausch. Mem. Mosc. t. x. f. 7. *M. bimaculata*, Oliv. Ency. Meth. viii. p. 93; Jacq. Duv. Gen. Col. iii. t. 93. f. 463.

Smaller than *M. pustulata*. The body is generally black, the elytra are rufous, marked towards the base with two black spots, at the middle with a broad band, nearly interrupted at the suture and narrowed towards the margin; near the apex another band, equally black, slightly dentate.

Native of Russia, Egypt and the East.

This species is stated by Gervais and Van Beneden (Med. Zool.) to be employed in Greece.

Olive-tree Mylabris, *Mylabris Oleæ*, Cast.; black; elytra brick-red; apex and two bands black, the foremost abbreviated laterally, the second entire, the margin not sinuated.—Cast. Hist. Nat. ii. 1840, p. 269; Erichs. Wagn. Reis. iii. 1841. p. 185. t. 8; Lucas, Exp. Alg. p. 387.

Antennæ black. Body black, rather shining. Head as broad as the thorax, closely punctate. Thorax laterally slightly rounded, punctate, subrugulose. Elytra smooth, densely and finely punctate, brick-red, with three black bands, the first scarcely touching the margin, the second in the middle of the elytra, the third apical, all with their margins nearly entire, the space before and behind the middle band nearly equal, the basal not more than half as broad. Length 10–12 lines.

This species is a native of Algeria, Tangiers and Morocco. M. Guérin-Méneville has named it as a vesicating insect, on whose authority it is cited by Moquin-Tandon (Med. Zool. p. 135). It is a large species, being equal to the majority of specimens of *M. phalerata*.

In Mozambique, Peters. (Reise, 1862) enumerates and describes eleven species, of which it is hinted that some are employed as vescants. Those named are *M. catenata*, *M. dicincta*, *M. pruinosa*, *M. ruficrus*, *M. serricornis*, *M. tettensis*, *M. tricolor*, *M. trifurca*, *M. tripartita*, *M. tristigma*, *M. lanuginosa*, and the *M. Burmeisteri* of Bertolini.

NOTE ON TINCTURE OF KINO.

BY A. F. HASELDEN, F.L.S.

The observations of Mr. J. W. Wood in the Pharmaceutical Journal, 19th August, 1871, upon the tincture of kino, U. S. Pharmacopœia, are worthy of recognition and consideration. The inconveniences arising from the gelatinizing tendency of the tincture are equally applicable to the form of the P.B. As a rule, tincture of kino is not in constant demand, but it is frequently ordered in combination with other remedies during a prevalence of diarrhœa, more especially at this season of the year, and many practitioners prefer it to catechu. Tincture of kino is also used as an adjunct to mouth-washes, and any method of making or keeping it so that it shall remain unaltered will be a desirable acquisition.

For some years past I have preserved tincture of kino from gelatinizing by keeping it in bottles holding two ounces only. Once commenced, this quantity is soon consumed, and there is no fear of a change taking place before so small a bottle is emptied. A few days ago I used the last of some prepared in 1869 stored in this manner. Four ounces also in a bottle kept filled did not gelatinize during the same period of time; but I doubt if this would be constant, as I have never succeeded in keeping a larger quantity, especially when the bottle was only partly filled. The addition of glycerine, as suggested by Mr. J. W. Wood, cannot, I think, be objectionable, and for other than the Pharmacopœia tincture I shall be tempted to try it, and hope to obtain an equally desirable result.

LÜNEBURGITE.

BY C. NÖLLNER.

Lüneburg, in Hanover, has for centuries been known for its manufacture of salt by evaporation. Dr. Volger has lately sunk a shaft to reach the deposits of rock-salt and possibly of potash-salts, and as Mr. Nöllner has analysed the minerals brought to light, he gives his opinion on the formation of saline deposits in general. He takes it for granted that the deposits at Stassfurt and other places, have been formed by the evaporation of sea-water. In this process chloride of sodium and gypsum separated first, after that the sulphates, then the chlorides of the alkalies, and, lastly, the deliquescent compounds of chloride of calcium and magnesium. Together with the last layer of chlorides other compounds separated, which were formed by decomposition in such manner that the deliquescent chlorides could give rise to but little soluble salts. Foremost among this class stand the boracites, which always contain chlorides, because every crystal includes some of the surrounding mother-lye.

Again, the lower strata of rock-salt contain gypsum with an equivalent of water, but the upper deliquescent chlorides contain anhydride, because the *concentrated* solutions of $CaCl + MgCl$ required all the water. In like manner artificial boracite, soluble to the extent of only 3 per cent., separates from the last mother-lyes in saltpetre refining; whereas, if it had been ready found from the beginning, it would have separated long before the potash saltpetre. For the same reason such saltpetre, containing borate of magnesia, with often 18 per cent. of chlorine, becomes richer in chlorine the oftener it is washed. Not only boracic acid, but also phosphoric acid, is found in these salts separated from sea-water, especially in Stassfurtite and in the boracites just mentioned, but most of all in the mineral which has been discovered at Lüneburg, and which, therefore, has been named Lüneburgite. Now, if the products of sea-water, formed by evaporation, contain phosphoric acid, boracic acid and fluorine, it stands to reason that these substances must originally have been in the sea-water; this had never yet been ascertained, but these substances are necessary for the formation of fish-bones, which can only be produced from the sea-water, as fish and their food live in the water.

Mr. Nöllner then dwells on the question of the evaporation of sea-water, but this is only of local interest.

The mineral was found to have the composition, $2MgO.HOPO_5 + MgO.BO_3 + 7HO$,

being MgO . . .	25·10	per cent.
PO_5 . . .	29·83	"
BO_3 . . .	14·82	"
HO	30·25	"
	100·00	

—*Buchner's Repert. für Pharm.* viii. p. 484.

HISTORICAL OUTLINES OF PHARMACY IN SPAIN.

BY DR. T. B. ULLERSPERGER, OF MUNICH.

In tracing back the history of Spanish pharmacy to its earliest infancy we must go to the general history of the profession, which records the gradual rise and development of the craft. The knowledge and experience of the ancient Greeks were personified by them; they identified the traditions of former times with a Melampus, a Chiron, or Æsculapius; philosophers and healers at that time, the true and only inquirers of nature, were the representatives of pharmacy; Hippocrates, Aristotle and the Esculapians were, to a certain degree, pharmacognosts. Pedanius Dioscorides appeared as a pharmaceutical writer; his works, to which at a later time the 'Alexipharmaca' was added, were made widely known by Mathioli. Nero's physician, Andromachus, was the first to take the title of archiates, or chief physician, and he gave his name to a nostrum, which even at the present day is largely sold in Venice and Madrid, viz. the theriaca Andromacha. Galen concentrated into practical application all the experience hitherto gained. The alchemy of the ancient Arabs, with all its transmissions from the magicians, had already participated in medicine, and the introduction of remedies from the mineral, animal and vegetable kingdoms became more sharply organized. But much superstition was mixed up with the use of plants, and the disgusting administration of excrements was pushed forward, and the prescription of precious stones was carried out to a ridiculous extent. This stage in our history is generally known under the name of the Galeno-Arabic period; the African Arabs of the Alexandrian school, trained in the remnants of Ptolemaic doctrines, in conjunction with Jewish healers and learned rabbis, carried much relating to remedies and their preparation from one shore of the Mediterranean to the other.

And here commences the true special history of Spanish pharmacy, still intimately united to the art of healing. We now meet with a very peculiar position of affairs. The Arabs had conquered part of Spain; Hispania had become a Roman province; Arabs and Romans predominated alternately; Arabs and Spaniards united to Mozarabs. The remnants of mysticism, transferred from the Greeks to the Romans, superstition, the self-illusion and deception of the magicians and Arabic alchemists, had to be destroyed; the best medical schools were filled by Arabs, following the Arabo-Greek system; Hippocrates' system, modified by a little Galeno-Arabism, prevailed in medicine. From the ninth to the eleventh century the Arabian schools flourished, the Arabian physicians considerably increased the number of remedies, and excelled in most complicated prescriptions. Galen's theory of putrefaction, originally Aristotle's idea, necessarily domineered over the whole of medicine. But with the expulsion of the Moors from Spain, under Ferdinand the Catholic and his queen Isabella, the influence of the Arabs and the Spanish Moors gradually died away, although it can be traced to the sixteenth century, when the celebrated physician of Philip II., Franz Valles of Covarubias, formerly professor at the University of Alcala de Henares, became one of its most strenuous supporters. At the time of the Saracens pharmacy became separated from the study of medicine in the renowned school of Alexandria. The Valentians and Catalans were amongst the first European people who fostered pharmacy. The enlargement of the materia medica,—beginning from the time of Alphonse the Wise, 1252, and to which the Crusades assisted,—furnished many subjects for investigation; chemistry gained more positive ground, it became incorporated into pharmacy, and the union between the latter and the healing art became more and more intimate.

This historical state of things no doubt had its origin in the circumstance that the most celebrated magicians and alchemists were of Arabian origin, while the most renowned physicians were either Jews or Arabs or Moorish Spaniards. The great acquisitions reserved for future centuries were the gradual amalgamation of a certain knowledge of remedies with technical pharmacy and the enrichment of the materia medica by chemical and pharmaceutical preparations. In this respect the time of the Abasides of the Orient stands out most praiseworthy. Curt Sprengel's 'Arabum Res Herbaria' is our great authority of the Arabic influence; also the works of Monte Cassino, who had lived for forty years among the Arabs, and who in his book 'De Gradibus,' 1536, recorded all Arabian remedies. The importation of many new drugs from recently discovered parts of the globe, and the foundation of botanical gardens, are proofs of special advancement. Among the most important discoveries of new drugs that of the cinchona bark in 1638 stands foremost, and it is well known that the Spaniards were the first to import it into Europe.

The first botanical garden was founded under Philip II. J. Pedro Esteve investigated the plants of the kingdom of Valencia; and Don Juan Fragoso, of Toledo, chirurgeon to the same king, travelled for the same purpose with Don Francisco Hermandez through the province of Seville. The Spaniards claim the discovery of making sea water palatable by distillation in the sixteenth century. Dr. Andrés Laguna wrote in 1566:—"Hacese el agua marina dulce ò a lo menos salobre y potable colandola por arena, destilandola en alambiques," etc. Towards the end of the fifteenth century the Spaniards, who figure prominently in the history of syphilis, assisted in the introduction of mercury and of the various ligna.

The bath forms a peculiar speciality in Spain. The Romans had popularized the use of baths in this province of theirs; they erected solid and spacious buildings for the purpose, the remains of which still exist. The Arabs adopted the custom; but the mischief created by the meeting of the two sexes induced Alonso VI. to prohibit the use of public baths and to destroy the buildings. Until the eighteenth century baths and mineral springs have been much neglected, which is the more surprising as the peninsula is peculiarly rich in medicinal springs. More recently this great mistake has been somewhat rectified, but analyses of many important springs are still wanting. Many foreign and native mineral waters are sold by pharmacists in Madrid and other towns.

(*To be continued.*)

THE HONEY TRADE.

BY P. L. SIMMONDS.

(*Continued from page* 168.)

Considerable quantities of honey are produced by the wild bees in the woods of North America. Bee-hunting is a most fascinating pursuit in the backwoods; the returning bee laden with sweets is watched to its home, and 150 lb. of honey are sometimes found in a single tree. The bee is a more adventurous colonist than man, and is always the precursor of cultivation in the Transatlantic forests. The keeping of bees is an object of domestic attention also in Canada, where some 10,000 or 15,000 hives indicate the produce of honey and wax. In Australia the natives are also very skilful in bee-hunting, and they adopt the following ingenious plan to discover their hives. A party of ten or twelve of them having caught an Australian bee, an insect not much larger than our common fly, attach to its body, with a gum that exudes from the mimosa, a little light white down, taken from the eagle or ibis. This is done as much for the purpose of causing the bee to fly slowly as to make the object as large and white as possible; they then, with a simultaneous shout, start off, running to and fro, following the movements of the bee for more than a mile, until the insect lights on its hive in the hollow branch of a gum-tree. In this manner the blacks collect abundance of honey, and the Australian honey greatly excels our finest heath honey.

The climate of Tasmania is most favourable for bees. The flowers of the eucalypti and mimosa furnish food for them, and the honey sent to the different European Exhibitions was much admired. In some parts of the colony, as at Perth, Bothwell, Ross, etc., old tea-chests and boxes are used for beehives and honey is procured by the ton. It is sold in the interior from 4*d*. to 6*d*. a pound, and is used by the settlers either in comb, or as mead or in the manufacture of beer. Swarms of bees which have escaped take possession of hollow trees; occasionally more than 100 lb. of honey are taken from a hole in a gum-tree.

The Arabs collect the bees in the bark of the cork-tree, formed into a cylinder, which they smear with honey to entice the bees to enter; they then close up the extremities, leaving only a small opening as a passage for the swarm; these tubes are extended lengthways on the ground and surrounded with thick bushes. It is almost incredible how much honey and wax they procure from them; the first serves them for food, and the latter is an article of commerce.

The *Apis fasciata* of Latreille appears to have been domesticated in Egypt ages before the hive bee of Europe was known. Niebuhr informs us it is extensively cultivated there at present, and that he met on the Nile, below Mansura, a convoy of 4000 hives, which were being transported from a region where the flowers had passed to one where the spring was later. The domesticated bee of Egypt affords of honey no very limited supply, but it is rather to the wild species of the same continent, inhabiting the endless forests, that the greater proportion of honey is derived, the quantity in some regions being remarkably abundant; so much so that various tribes pay their yearly tribute with it. Sir J. E. Alexander, in his expedition of discovery into the interior of Africa, informs us that beeswax on the Orange river could be procured in very great abundance. A Namaqua, who had a waggon, assured him (and he had no reason to doubt his word) that on a honey hunt he had filled his waggon with skin-sacks of honey alone, and the side planks in two or three days. It is to be regretted that the name of the bee is not noticed. In 1830 no less than 242 tons of beeswax, worth £100 per ton, was exported from the Gambia, and it appears that in the Mandingo country honey is retailed at 2*s*. 6*d*. per gallon. A considerable quantity of wax is also imported from the Gold Coast. The wax is sometimes attacked by the larvæ of a species of tinea, and the weight consequently greatly diminished: this robbery might, no doubt, easily be prevented.

Mr. W. Tegetmeier, at his apiary, Muswell Hill, has introduced the *Apis ligustica*, or Ligurian bee, an abundant honey collector, which has also been introduced successfully into Germany. The principal species of bees kept for domestic purposes are the following:—*Apis mellifica*, Linn., or the common hive bee of Europe, and which has also been introduced into the United States of America and New Zealand; *A. ligustica*, Spinola, kept in some parts of Italy; *A. fasciata*, Latr. in Egypt, and in some parts of Asia Minor; *A. unicolor*, Fab. in Madagascar; *A. indica*, Linn. at Bengal; *A. Adansonii*, Latr., at Senegal.

The production of honey and wax in Austria, according to the imperial statistical bureau, was in 1854, 547,700 cwt. of honey, and 54,770 cwt. of wax, of the value of about £1,000,000, but as this includes only the produce which enters into commerce, and four out of every five bee-keepers consume their own production, Austria may fairly be said to realize annually £3,000,000 from bee-culture. In the ten years ending with 1859, the imports of honey and honey-water into Austria have ranged from 3000 to 25,000 cwt. per annum, of which about 2000 cwt. were re-exported. Of wax, in the same period, the imports averaged about 5000 or 6000 cwt., of which about 2000 cwt. were re-exported. The total number of bee-hives in Austria in 1854 was returned at 2,733,000, giving an average of 270 to the square mile, and producing for the same average area 58 cwt. of honey, and 6 of wax, worth 945 florins. The rearing of bees is carried on most extensively in the Vayvode, and the Temesia, the Banat, Croatia, Slavonia and Transylvania, on the frontier of Galicia, in Styria, Carinthia and Carniola. In the other provinces this trade is of little consequence or extent.

In the States of the Zollverein, about 7000 or 8000 cwt. of wax are imported annually, of which about 2000 cwt. are re-exported. The import of honey is not specifically mentioned in the tariff; but considering the area, population and industry, the value of the honey and wax produced in the States may be estimated in round numbers at £2,000,000 in value, and with that imported at about £2,500,000. In the Grand Duchy of Baden, there were returned 49,146 hives in 1855, and 75,111 in 1861. In Würtemberg there are about 100,000 hives; but this number might be doubled, if care were taken to provide at hand those plants from which the bees derive their honey, and which abound in the forests, the meadows and the fields of colza, etc. These different plants form a rich spoil, from which this comparatively new industry might derive great advantage. Nature and art mutually combine to produce the different kinds of honey and wax, which afford a large profit to the country. The rearing of bees is extensively carried on in the several parts of European Russia, particularly in the central and southern governments, as well as in the Polish, and in Transcaucasian provinces. This insect acclimatizes up to a very high latitude, even in Siberia. It was long thought that the climate of the latter country was utterly unsuitable for the rearing of bees; but experiments made at the commencement of the present century in the governments of Tomsk, Omsk, and Jenisseisk, have proved the contrary. It has greatly suffered, however, in some provinces, from the destruction of the forests; for the bee prefers well-wooded districts, where it is protected from the wind. The honey procured from the linden-tree (*Tilia europæa*) is only obtained at the little town of Kowna, on the river Niemen, in Lithuania, which is surrounded by an extensive forest of these trees, and where the rearing occupies the principal attention of the inhabitants. The Jews of Poland furnish a close imitation of this honey, by bleaching the common kinds in the open air during frosty weather.

(*To be continued.*)

ACTION OF HEAT ON PROTOPLASMIC LIFE.

BY F. CRACE-CALVERT, F.R.S.

Those investigators of germ-life who favour the theory of spontaneous generation have assumed that a temperature of 212° Fahr., or the boiling-point of the fluid which they experimented upon, was sufficient to destroy all protoplasmic life, and that the life they subsequently observed in these fluids was developed from non-living matter.

I therefore made several series of experiments, in the hope that they might throw some light on the subject.

The first series was made with a sugar solution, the second with an infusion of hay, the third with solution of gelatine, and the fourth with water that had been in contact with putrid meat. The hay and putrid-meat solutions were taken because they had often been used by other investigators; sugar was employed, being a well-defined organic compound free from nitrogen, which can easily be obtained in a state of purity; and gelatine was used as a nitrogenized body which can be obtained pure and is not coagulated by heat.

To carry out the experiments I prepared a series of small tubes made of very thick and well-annealed glass, each tube about four centimetres in length, and having a bore of five millimetres. The fluid to be operated upon was introduced into them, and left exposed to the atmosphere for sufficient length of time for germ-life to be largely developed. Each tube was then hermetically sealed and wrapped in wire gauze, to prevent any accident to the operator in case of the bursting of any of the tubes. They were then placed in an oil-bath, and gradually heated to the required temperature, at which they were maintained for half an hour.

Sugar Solution.—A solution of sugar was prepared by dissolving 1 part of sugar in 10 part of water. This solution was made with common water, and exposed all night to the atmosphere, so that life might inpregnate it. The fluid was prepared on the 1st of November, 1870, introduced into tubes on the 2nd, and allowed to remain five days. On the 7th of November twelve tubes were kept without being heated, twelve were heated to 200° F., twelve to 300° F., and twelve to 400° F.

The contents of the tubes were microscopically examined on the 1st of December, twenty-four days after heating.

Sugar Solution not heated.—There were about 30 animalcules under each field of the microscope, principally *small black vibrios*, 2 or 3 microzymes swimming slowly about, 3 or 4 *ordinary swimming vibrios*, and a few bacteria.

Heated for half an hour at 212° *F.*—A great portion of the life had disappeared, no animalcules were swimming; still this temperature had not completely destroyed life. 4 or 5 *small black vibrios* were observed moving energetically to and fro; 2 or 3 *ordinary vibrios* were also observed moving energetically in the same position of the field, that is, without swimming about.

Heated for half an hour at 300° *F.*—The sugar was slightly charred, but the life was not entirely destroyed, as 1 or 2 *ordinary vibrios* and 1 or 2 *small black vibrios* were observed in motion under the field of the microscope.

Heated for half an hour at 400° *F.*—The sugar was almost entirely decomposed; no trace of life was observed.

Heated for half an hour at 500° *F.*—No life observed.

Remarks.—The black vibrios here referred to are far more opaque than the other varieties of vibrios, and are the most important of all, as I have found them to resist not only very high temperatures, but all chemical solutions. I shall, in my paper on putrefaction and the action of antiseptics, describe the various vibrios and give drawings of them.

Hay Infusion.—An infusion of hay was made by macerating it in common water for one hour, then filtering the liquor, and leaving it exposed to the atmosphere all night, when it was sealed in the small tubes, twelve of which were used for each experiment. The infusion was made on the 4th of November, sealed in tubes on the 5th, and heated on the 7th.

The results were examined on the 1st of December, 1870, twenty-four days after being heated.

Hay infusion not heated.—Fungus matter was observed growing on the surface of the fluids in two of the tubes. On subjecting the contents of some of the tubes to examination, from 20 to 25 animalcules were observed under each field of the microscope. This kind of life resembled small dots moving energetically to and fro; 1 or 2 ordinary vibrios were also present.

Heated for half an hour at 212° *F.*—No fungus matter was noticed on the surface in any of the tubes. A few small black vibrios present in the original solution were also present in this.

Heated for half an hour at 300° *F.*—No fungus matter present, but some of the small black vibrios were still present, although in less numbers.

Heated for half an hour at 400° *F.*—No fungus matter observed. The fluid was filled with irregular masses of coagulated matter, and life had disappeared.

Heated for half an hour at 500° *F.*—No life present.

Gelatine Solution.—A solution of gelatine, prepared of such strength that it remained liquid on cooling, was exposed for twenty-four hours to the atmosphere. It was then introduced into the small tubes, and the tubes sealed. The solution was made on the 4th of November, the tubes sealed on the 5th, and subjected to the different temperatures on the 7th.

The fluids were examined on the 1st of December, 1870, twenty-four days after being heated.

Gelatine Solution not Heated.—There were seven or eight animalcules under each field, five or six of which were quite different to anything observed in the other fluids. They had long thin bodies, swimming with a peristaltic motion. One or two ordinary swimming vibrios were also present; but the small black vibrios were absent.

Gelatine Solution Heated for half an hour at 100° *F.*—Life seemed to have only slightly decreased, and none of the animalcules were swimming. The peculiar animalcule mentioned in the previous paragraph appeared to retain still its peristaltic motion, but not sufficient power to move across the field; a few ordinary vibrios being also observed moving to and fro.

Heated for half an hour at 212° *F.*—A very decided diminution in the quantity of life present was noticeable.

Heated for half an hour at 300° *F.*—No life present.

Heated for half an hour at 400° *F.*—No life present.

Putrid Meat Fluid.—Water was placed in an open vessel, and a piece of meat suspended in it until it became putrid and contaminated with myriads of animalcules. This fluid was placed in the usual tubes, which were sealed on the 7th of November, and heated on the same day.

The contents of the tubes were subjected to examination on the 1st of December, or twenty-four days after having been heated.

Not Heated.—A large quantity of life was present, namely, microzyma and several distinct species of vibrios, among which were a number of the small black ones frequently mentioned.

Heated for half an hour at 100° *F.*—This temperature had but slightly affected the life present, the animalcules being as numerous as in the liquid not heated, and moving as usual. However, one species of very long vibrios appeared to be considerably affected, as they were much more languid in their movements.

Heated for half an hour at 212° *F.*—This liquor differed from all the others in being turbid and coagulated. Life was still present; and although heat had deprived the animalcules of the power of locomotion, still they retained a sufficient amount of vital force to place it beyond a doubt that life was not destroyed.

Heated for half an hour at 300° *F.*—The liquid was quite clear, the albumen (which is coagulated at 200°) appearing to be redissolved. A large quantity of the life in the fluid was destroyed, but some vibrios still remained, the small black ones being the most numerous.

Heated for half an hour at 400° *F.*—All life had disappeared.

Heated for half an hour at 500° *F.*—All life had disappeared.

The results recorded above show that protoplasmic life is but slightly affected by a temperature of 212° F., and that, even at a temperature of 300° F., it is not entirely destroyed, excepting in the case of gelatine. In all the other fluids a temperature of 400° F. is necessary to completely destroy the life. These experiments, therefore, clearly show that the life found by previous experimenters in fluids which have been submitted to heat was not due to heterogenesis, but to life which had remained in the fluids, as I have seen no experiment reported where the temperature to which the fluids were exposed exceeded 300° F.*

I am the more justified in making this statement, as I have repeatedly examined the contents of tubes which had been submitted to a temperature of 400° F., both immediately after cooling and at all periods up to thirty days, and was unable in any instance to detect the slightest trace of life.

This important result corroborates those recorded in my previous paper, and proves that the spontaneous-generation theory is not yet by any means established.

It occurred to me that it might be interesting to examine the influence on pure albumen of the putrid-meat fluids that had been heated, and note whether they still possessed the property of propagating life. A solution was prepared by mixing the albumen of a new-laid egg with pure distilled water free from life (prepared as described in another paper). Equal volumes of this solution were placed in six small test-tubes, which had

* It is with pleasure that I find these experiments to confirm the suggestion of Dr. Beale, in his work entitled 'Disease-Germs, their supposed Origin,' p. 50 (which I read a few weeks ago), that "living forms might live though exposed, under certain conditions, to a temperature of 350° F."

been cleaned with hot vitriol and well washed with pure water. To one tube two drops were added of the putrid meat solution that had been heated to 100° F., to a second two drops of that heated to 212° F., to a third two drops of that heated to 300° F., to a fourth an equal bulk of fluid heated to 400° F., and to a fifth the same quantity heated at 500° F. In the sixth the albuminous solution, without anything added, was kept for comparison.

The tubes were sealed and kept from the 1st of February to the 9th.

RESULTS OF EXAMINATION.

Albumen Solution.—In each drop two or three small black vibrios, moving to and fro.

Albumen Solution, with Putrid Meat Liquor, heated to 100° F.—Abundance of life.

Albumen Solution, with Putrid Meat Liquor, heated to 212° F.—Abundance of life.

Albumen Solution, with Putrid Meat Liquor, heated to 300° F.—Much less life than in the two fluids previously examined.

Albumen Solution, with Putrid Meat Liquor, heated to 400° F.—In each drop two or three small black vibrios, moving to and fro.

Albumen Solution, with Putrid Meat Liquor, heated to 500° F.—In each drop two or three small black vibrios, moving to and fro.

These results clearly show that, at the temperatures of 100°, 212°, and 300° F., life and its germs had not been destroyed, whilst at 400° F. they had; for the results of the examination were in this case exactly identical with those of the albumen solution itself; and the life found was doubtless introduced in the preparation of the solution, and was not due to any life having remained in the fluids that had been heated.

Although perfectly aware of the interesting researches of Professor Melsens, proving that the most intense cold does not destroy the active power of vaccine lymph, still I thought it desirable to ascertain the effect of a temperature of 15° F. on well-developed germ-life, similar to that which had been subjected to the action of heat.

Some putrid meat liquor, therefore, containing a large quantity of microzyma and vibrios, was subjected for twenty hours to the influence of a temperature ranging between the freezing-point of water and 17° below that point, when the ice was melted and the liquor examined. The animalcules retained their vitality, but appeared very languid, and their power of locomotion was greatly decreased.

Two hours after melting the ice, the liquor was again examined, when the animalcules appeared to be as energetic as before.

AMBER.

A very large proportion of the amber appearing in the various markets of the world is supplied by the province of Prussia, including the neighbouring district of Memel. The amber trade in this district is entirely in the hands of one firm, and as their transactions are kept very secret, it is difficult to ascertain its exact extent. The following particulars, which are gleaned from a report by Mr. Ward, her Majesty's Vice-Consul at Memel, are not without interest:—

In the western portion of the province of Prussia, amber is found not only on the seashore, but also in the mountainous ranges of the interior; excepting, however, in rare cases of its appearance in so-called "nests" amber is only to be met with in isolated pieces in the latter localities, so that the profit arising from the amber diggings amongst the hills is but a very moderate one, and may be estimated at about double the amount paid by the proprietors for the wages of the diggers. In East Prussia, however, and especially in that part called the Samland, amber is more abundant, and during the prevalence of certain winds, is frequently thrown upon the shore by the sea in large quantities; it is collected there, as well as fished for in the surf; it is also dug out of the sand-hillocks running along the seacoast. In these sand-hillocks regular beds of amber are found enclosed in a soil of blue clay, which is to be met with at an average depth of about a hundred feet, in a thickness of twenty-five to thirty feet. It is stated that out of some diggings established in those parts, 4,500 lb. of amber were raised in the course of four months of the year 1869. Diggings of this kind exist at present in various spots of the Samland, more especially at Wangen, Sassan, Groskuhren Kleinkuhren, Kraxtepellen, Kreislacken and Hubnicken. Besides these works, there are other establishments at Brusterort, where amber is obtained by divers from the bottom of the sea, and at Schwarzort (near Memel) where it is raised by dredging for it at the bottom of the Curish Haff; the dredging establishment last-mentioned has been noticed at length in my Trade Report for the year 1866; its importance and size has of late years increased considerably, and at present about 80,000 lb. of amber are annually obtained by it.

The total amount of amber obtained during the year 1869 in all parts of the province of Prussia by the various means of collection, is estimated at about 150,000 lb., the value of which may be taken at 550,000 Prussian dollars. The quantity collected (by fishing for it) in the sea and upon the shore, is about equal to that raised by the digging and dredging works.

According to the opinion of competent persons, the produce of the diggings could be increased considerably by working them upon a regular mining system. Apart from the fact that no certain knowledge has hitherto been arrived at as to the actual extent of the amber fields in the blue clay, and these fields exist most probably not only in the vicinity of the seacoast, but also in the interior of the Samland, and even beyond that district and the frontiers of Eastern Prussia, it is most likely that below the stratum of clay to which the diggings are at present confined, there are other strata in which amber would be met with. This supposition is based upon the circumstance that considerable quantities of amber have been found amongst the soil washed away by the sea during heavy gales, from those portions of the coastal sand hills which lie below the layer of blue clay first alluded to.

The prices of the principal kinds of amber, as stated by an Official Report, vary according to the size, ranging from twenty-two Prussian dollars per lb. where the pieces run about nine to the pound to four dollars where the pound requires one hundred pieces or more. The prices of larger (so-called cabinet) pieces are subject to great fluctuations, and are fixed by the increase or decrease of demand from the East; the prices of the commoner kinds seldom vary more than about 10 per cent.

The chief seat of the retail amber trade is Dantzig; the wholesale trade is at present in the hands of only two or three firms in the province of Prussia. The working of the Prussian amber into mouthpieces, beads, etc., is likewise carried on chiefly at Dantzig, but also in all large cities; of late a manufactory of amber wares has been established at Polangen, a small Russian town near Memel, and it is intended to open similar works at Königsberg, Moscow, and at New York.

Sponges abound on the east coast of Crete, but the natives do not dive for them. This hazardous calling is pursued by Greeks from the islands of Symi, Calymno, and Khalki, who come yearly in numerous small craft, and purchase licences to fish for sponges. These duties are farmed, and the actual farmer is a Frenchman, who also fishes on his own account, and makes use of a small steamer and diving-bell to facilitate his operations.—*Consul's Report.*

The Pharmaceutical Journal.

SATURDAY, SEPTEMBER 2, 1871.

Communications for this Journal, and books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*

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THE POISON REGULATIONS CONTROVERSY.

THOUGH it is now some months ago since the late PRESIDENT expressed in anticipation his delight at the prospect that the pages of this Journal would be no longer encumbered by controversy on Poison Regulations to the exclusion of more valuable matter, and that contention in the pharmaceutical body would cease, still these desirable results have not been attained. Our columns instead of flowing with the milk and honey of pure pharmacy have been swamped with *débris* brought down by the poison-flood of the past six months. We have not even been able to avoid contributing editorially to the accumulation, and although correspondents declare themselves thoroughly tired of the controversy they still go on with it.

In addition to the letters which appear this week, we have received several others on the same subject which we refrain from publishing, partly because the writers in some instances request an exercise of editorial discretion, and partly because the other letters throw no new light on the subject.

While referring to this controversy, we will repeat the suggestion already offered last month, that the time for discussion is past, and we will now add the expression of our hope that the energies of pharmaceutists will be directed to other subjects, for the evening meetings of the approaching session will raise a demand for papers which can only be satisfied by them.

Before, however, dismissing the subject of poison regulations, we must mention that the proceedings relating to some recent cases of poisoning are striking illustrations of a very general ignorance of existing laws and regulations, not only among the public, but among magistrates, coroners, and the press. In one instance, a coroner expressed a hope that the next session of Parliament would produce an Act compelling druggists to label bottles in which they sold poison, and another suggests that arsenic should be sold coloured. These and analogous cases to which we have already referred seem to show that the public mind is foggy in regard to the measures by which protection against accidental poisoning is sought to be attained.

In addition to this, it would not be difficult to extract from recent cases of poisoning much evidence in support of the opinion long since expressed by one of the seniors of British pharmacy, that legislative protection against accidental poisoning is an impossibility.

ACCLIMATIZATION OF PLANTS.

THE introduction into our colonial botanic gardens of various economic plants has proved that many of them could be readily acclimatized, and so become valuable additions to the vegetable productions of their adopted land. We learn that in the Botanic Garden of Adelaide, South Australia, many foreign medicinal plants have been introduced, and are growing so well that there is now no doubt as to their adaptability for cultivation in that colony. Dr. SCHOMBURGK, the director of the Garden, says the demands by invalids for one or other of these herbs becomes more and more frequent.

The Madder (*Rubia tinctoria*) also grows so vigorously that, if it were not checked, it would spread in all directions and become a nuisance. Here, then, are instances of successful acclimatization of really useful plants. In France thousands of acres of land are devoted to the cultivation of Madder, and large profits are realized. We are all aware that it is one of the most important dye-plants known in commerce, so that, notwithstanding the heavy expense of freight owing to the great distance from Australia to Europe, it would no doubt prove a profitable crop for cultivation in Australia. Moreover the plant appears to require little or no attention during the progress of its growth.

PROFESSOR STOKES in his Presidential Address, delivered before the British Association, at Exeter, in 1869, referred to the artificial formation by MM. GRAEBE and LIEBERMANN of alizarine, one of the colouring principles of madder. Assuming that it might be possible to produce it at a sufficiently cheap rate, he instanced it as an example of the way in which the philosopher, quietly working in his laboratory, may obtain results which revolutionize the industry of nations, and also speculated upon the number of acres hitherto employed in madder cultivation that would be set free for the production of food or some other substance useful to man. Already there seems to be some verification of the soundness of his conjectures, for her Majesty's Consul in Cyprus reports that last year the demand for madder-roots grown in the island was limited with a corresponding fall of prices, and that this result is attributed by some persons to the influence of the discovery above mentioned. He adds, "Such a result, however beneficial to the world in general, would entail great loss to the owners of madder ground in Cyprus, which sells at as much as £70 an acre, while common grain-land can be had at £2 an acre."

The influence of forests upon the climate of a country, and the relation of the vegetation to the local peculiarities of a district, has often been observed. A fresh illustration is to be found in the Italian province of Oneglia, where for the last two years the olive crop has suffered from drought. It has been noticed that in recent years the rain that has fallen on this coast has been much less in quantity than formerly; and olive plantations, which were considered safe and lucrative property, are now looked upon as a bad speculation. The want of rain is generally attributed to the reckless way in which the mountains above the oil range have, especially of late years, been cleared of the forests which clothed them. From time immemorial the wood has been cut without any system of replantation; but, until about twenty years ago, there being no very great demand, and the mountains being utterly without roads, the quantity brought down to the coast was not large. Since that time the country has been opened up to a certain degree by roads, there has been an enormously increased demand for beech and oak for shipbuilding and chestnut for housebuilding, and some of the woods have been absolutely swept away without a tree being left. A society has been formed, having for its object to stop these reckless clearances, and to induce proprietors to replace, by degrees, the timber in those positions which do not allow of tillage.

Her Majesty's Consul at Santa Martha, New Granada, reports that although the cinchona bark shipped at that sea-port, and brought from the states of Tolima, Boyacá and Cundinamarca, is not so highly appreciated in European markets as that from the state of Cauca, known as Pitayo bark, and exported through the port of Buenaventura, yet its quality has of late greatly improved. The quantity exported from Santa Martha in 1869—amounting to upwards of 12,000 serons—was greatly in excess of any previous year, and nearly four-fifths of it was sent to England.

The cinnabar mines discovered in Borneo are now being worked by the Borneo Company. Retorts were erected last year, and a fair quantity of quicksilver obtained. The great difficulty of transport, however, enhances the cost of working very considerably. The antimony mines are also reported to be yielding good ore in fair quantities.

An association has been organized at Washington under the name of the Columbia Pharmaceutical Association. Some of the principal pharmacists of the city have taken an active part in its institution.

Proceedings of Scientific Societies.

BRITISH PHARMACEUTICAL CONFERENCE.

Tuesday Afternoon, August 1.

The Conference resumed at two o'clock; Mr. Stoddart, President, in the chair.

Dr. Attfield read the following paper:—

The Compound Iron Mixture of the Pharmacopœia.

BY C. A. STAPLES.

This has always been a favourite medicine, and, when carefully prepared, is perhaps one of the safest and most efficacious of the tonic chalybeate emmenagogues, and, consequently, it is the one most frequently prescribed, but it has always been exposed to the great objection that its extemporaneous preparation takes considerable time, and it cannot be kept ready for use as its character soon changes,—a few hours making a perceptible difference in its appearance, even if it does not in its medicinal efficacy. To remedy this defect, I endeavoured to prepare it in a concentrated form in two bottles. After a few experiments, I adopted the following formula, which I have used for a number of years, and the result has been so satisfactory as to leave nothing to be desired:—

℞. Gum. Myrrh. ℥ij
Potas. Carb. ʒj
Sp. Myrist. ℥viij
Aq. Rosæ ad ℥xx.

The myrrh should be very carefully selected,—clean pale pieces, presenting an opaque fracture being the best. Beat it as fine as possible in a large mortar, then add the carbonate of potash with a little rose-water and grind it to a smooth paste, gradually add about half a pint of rose-water to make a fine emulsion, add the spirit of nutmeg and as much more rose-water as will make it twenty ounces; preserve it in a stoppered bottle, labelled "Concentrated Myrrh Emulsion pro Mist. Ferri Co. ʒj to ℥j."

For the other bottle, boil 2 fluid ounces of distilled water in a glass flask; add ℥j of sulphate of iron, pure and free from oxide, dissolve and filter it into a 6-ounce bottle and fill it up with simple syrup, label it "Syrup of Sulphate of Iron gr. j in ♏vj, or ♏xv to each ounce of Mist. Ferri Co."

These preparations will be found very convenient; as for each ounce of the mixture, you have merely to measure ʒj of the emulsion and ♏xv of the syrup, dilute each with a portion of rose-water, mix and fill the bottle with rose-water, and mist. ferri co. of excellent quality is made in a few seconds.

Both preparations keep well; the quantity of spirit in the emulsion preserves it from decomposition, and it rather improves by keeping; and the syrup will be found to keep free from oxide, which the crystals rarely are, however pure they may appear to be; it may also be used for dispensing sulphate of iron in other mixtures, where the sugar is not an objection, for this purpose I make the above solution of ℥j of sulphate into an 8-ounce bottle of syrup, this gives one part of sulphate in eight measures of syrup, which I find more convenient for general dispensing, but it contains too much sugar for the mist. ferri co. as directed in the present edition of the Pharmacopœia.

The Chairman said that the quantities seemed to be very handy, and he believed it made a very good mixture.

Mr. Horncastle said he would like to know whether the emulsion formed in this way was as good as otherwise. He had not been so well satisfied with the appearance of the emulsion as when it was prepared at the time. He had found that sulphate of iron might be preserved with the greatest ease by avoiding putting it in a bottle. If it is put in a proper box, it might be kept in perfection for an unlimited period.

Mr. SCHACHT said that Mr. Horncastle had spoken of the difficulty of keeping the sulphate of iron free from change, and that it was less likely to change if kept in a box than in a bottle. That was a new idea, and he could scarcely have expected the result; but, of course, there was the well-known fact, practically more interesting, that a little piece of camphor put into the bottle prevented the change. He noticed that it had that effect; and if it was the case that a little bit of camphor prevented any change, it must be some chemical influence, and he should like to know if any gentleman could give an explanation of that which was a great mystery.

Mr. MATTHEWS said that as to keeping sulphate of iron in a box, he had not done so, but he had kept chemically pure sulphate of iron in a loosely-corked bottle, and it did not suffer any change in the course of five or six years. The cork had not been changed. He had not tasted it, but the colour was as good as when he received it.

Mr. WILLIAMS said he found that the crystals would keep for a considerable period when they were solid. There were certain kinds of sulphate of iron that would keep, and it was because of the density and solidity of the crystals, and did not depend upon the impurity of the metal.

Professor ATTFIELD said that many specimens of sulphate of iron made by the students came under his notice every year, and he found that when a solution gave single crystals those single crystals were always hard, and some that had no interstices between the plates would keep remarkably well. It was a fact, that the single crystals, the hard crystals, kept perfectly well; but with the masses of sulphate of iron they did not keep.

Mr. HORNCASTLE said that this subject had occupied his attention for some years, and he believed the presence of water, which was enclosed within the masses of crystals, was the source of difficulty.

Mr. ROBBINS was of opinion that the keeping qualities of the crystals depended on their hardness and freedom from water, mechanically retained in thin interstices; and mentioned as an example that he had a natural crystal of large size, which was kept in a glass case for some years, showing scarcely a trace of oxidation.

REPORT ON THE PERMANGANATE OF POTASSIUM OF PHARMACY.

BY ALFRED H. ALLEN, F.C.S.,

Lecturer on Chemistry at the Sheffield School of Medicine, etc.

Permanganate of potassium occurs in the form of prismatic crystals, so deep in colour as to appear black, with brilliant coloured reflections. The crystals are anhydrous, permanent in the air, and soluble in about sixteen parts of cold water. The solution is neutral to test paper and a most powerful oxidizing agent, organic matter being rapidly turned brown by the reduced salt.

The amount of real permanganate was estimated by dissolving the salt in 500 parts of distilled water, and deoxidizing it by an accurately measured quantity of oxalic acid solution of known strength, the liquid being acidified with sulphuric acid. This is the ordinary method of determining the strength of solutions of permanganate, and is rapid and accurate.

The oxalic acid solution at first employed contained 63 grammes of the crystallized acid in 1000 grammes of distilled water. In the latter experiments a solution of half this strength was used.

Five atoms of oxalic acid are deoxidized by two atoms of permanganate, therefore 630 parts $H_2C_2O_4 + 2aq. = 316$ parts $KMnO_4 = 80$ parts available oxygen.

No. 1 was a sample of crystallized permanganate of potassium obtained in Sheffield. It was dissolved in 500 parts of water, and decolorized with the standard oxalic acid, of which 10 c. c. were oxidized by 163 c. c. of the permanganate. These numbers correspond to a percentage of 96·93 of pure permanganate.

No. 2 sample was bought in Newcastle-upon-Tyne. The crystals were larger than those composing No. 1, and it was chosen as the best of several specimens. The mean result of the analyses showed a percentage of potassium permanganate of 98·87.

No. 3 had been in the possession of the author nine or ten years, and was purchased in London. It contained 93·55 per cent. of real permanganate.

Following are the tabulated results of the examination of the above three samples:—

	No. 1. Per cent.	No. 2. Per cent.	No. 3. Per cent.
Real $KMnO_4$	96·93	98·87	93·55
Available Oxygen . . .	24·54	25·03	23·69

All three samples contained traces of sulphate, but no chloride. On solution in water they left a small quantity of a heavy, dark-coloured residue. That from No. 3, which was largest in quantity, dissolved in oxalic acid with effervescence, and the solution, rendered alkaline with ammonia, gave a brownish precipitate with potassium ferricyanide, proving the residue to have been manganese dioxide. The residues from Nos. 1 and 2 seemed similar.

The liquor potassæ permanganatis of the British Pharmacopœia contains 80 grains of the salt to the pint of water =

$KMnO_4 = 0·9143$ per cent.
$= 9·143$ grammes per litre.
= Available Oxygen 2·315 „ „

A sample of Condy's Crimson Disinfecting Fluid had an oxidizing power equal to—

$KMnO_4$ 1·550 per cent.
$= 15·50$ grammes per litre.
= Available Oxygen 3·921 „ „

A specimen of Condy's Green Fluid had almost as great an oxidizing power as the crimson. The active oxygen of an equal number of atoms of manganate and permanganate is as 4 : 5, and the atomic weight of the former salt being higher, gives the calculated amount of manganate of potassium in the green fluid as—

$K_2MnO_4 = 24·0$ grammes per litre.
= Available Oxygen 3·883 „ „

The oxidizing power of the green fluid is not entirely due to manganate, as a small but variable amount of permanganate is always present. This may be detected by precipitating the manganate with barium chloride and filtering through asbestos, when the crimson colour of the permanganate becomes apparent.

A qualitative analysis proved the crimson fluid to contain much sulphate, evidently due to the sulphuric acid employed to neutralize the excess of alkali in the crude product. The green fluid was strongly alkaline, the crimson nearly neutral. In other respects they were similar.

It was not thought requisite to examine a larger number of specimens of permanganate, as inquiry proved it to be of limited application in pharmacy, and the above results showed that *the crystallized salt was practically pure.*

Dr. ATTFIELD read a paper on—

USE OF BLISTERING FLIES IN HYDROPHOBIA.

BY HENRY GROVES, OF FLORENCE.

The paper on Chinese blistering-flies by Dr. F. Porter Smith, recently published in the *Medical Times and Gazette*, mentions the employment by Chinese practitioners of blistering insects in cases of hydrophobia; and as I am not aware of the remedy being similarly used in

Great Britain, it seemed to me that further attention should be paid by qualified men to a medicine which has a certain repute in several parts of Europe for curing the bites of mad animals. Dr. Grisanowski, of this city, kindly informed me of its use in Russia and France, and has supplied me with information on the subject. It appears that about thirteen or fourteen years ago a certain Nikititsch Levachoff, of Peklitz (Government of Riazan, Russia), created a sensation by his cure of hydrophobia. His arcanum was supposed to be the *Cetonia aurata*, or rose beetle. The monks of Phaneromenos, near Eleusis, Greece, use the insect *Mylabris bimaculata*, with equal parts of the leaves of *Cynanchum excelsum*, in doses of 15 grains of the mixed powder; at the same time they cauterize the wound with boiling oil. The physician of the late King Otho, of Greece, often gave half-grain doses of cantharides, until symptoms of incipient gastro-enteritis declared themselves. Here in Tuscany there are one or two persons who are reputed to be able to treat successfully the bites of mad animals by means of a nostrum whose basis is supposed to be cantharides, or other insects with blistering properties; and it appears that their efforts are not unavailing, inasmuch as a medical man, to my knowledge, was convinced of the efficacy of the remedy, and caused a number of bottles to be prepared by one possessing the secret, and forwarded them, with a memoir, to the Academy of Medicine at Paris. As the box containing the remedy must have arrived at its destination but a short time before the breaking out of the recent war, it is probable that the whole matter has been set aside and forgotten. Speaking of the remedy to the physician, I suggested to him that it contained cantharides, to which he assented, or supposed that at least some blistering fly entered into the composition; and it then occurred to me that I had once copied an ancient recipe for hydrophobia, and that out of curiosity I had retained a copy for myself. Probably the two compounds are identical. The formula in my possession was represented as a secret left by S. Donnino to the family of Boccaccio, and is represented by the following translation:—

Secret for Curing the Bites of Mad Dogs.

Take of cloves, grains 54
cinnamon, grains 54
pepper, 1 drachm and grains 36
cantharides, grains 27. Mix.

Dose according to age:—
From 25 years and upwards, grains 26
For 12 years, grains 19
10 years, grains 14
4 years, grains $6\frac{1}{2}$
2 years, grains $3\frac{1}{2}$

It may be taken from the day of the bite up to twenty-five days after. The remedy must not be administered to pregnant women. It is to be taken in one dose according to age, as marked above, in wine, broth or water, according to the taste of the sick person. It must be administered fasting, and the patient should not eat anything for at least four hours, and during this time should take a great deal of exercise, in order that the remedy should act the more. The patient will suffer strong pains in the head and kidneys, besides other inconveniences; even to the passing of bloody urine, should the dog have been really mad, and the blood have commenced to be contaminated. If at the height of the pain the patient would like to drink a glass of Nocera or Lettuccio water, it will serve him as a relief.

Remarks.—Tuscan grains have the value of 5 centigrams; consequently are less than the grain employed in Great Britain, Germany, etc. Nocera water is derived from a source in the Central Apennines, and Lettuccio water is the produce of one of the springs at Montecalino in Tuscany. It has laxative properties, and is less nauseous than many other purgative waters.

The *Cantharis vesicatoria* is found in several parts of Tuscany, its chief source being the Val di Chiana, where the peasants collect it by spreading cloths under the trees morning and evening, and shaking the insect out of the branches. The months of May and June are those in which the gathering takes place, and the fly prefers the Olive-tree to the Poplar and Ash, which they also frequent. They are killed by being plunged into weak vinegar, or by being held over the steam of the same. Afterwards they are dried as rapidly as possible in the sun, and are frequently turned over by a thickly gloved hand, or by other means.

The Chairman said that if he were bitten by a mad dog, he would not like to trust to the remedy here proposed.

Dr. Attfield read a paper on—

Solutions.

BY T. B. GROVES, F.C.S.

A short discussion that ensued on the reading, before the Pharmaceutical Conference at Liverpool, of Mr. Rimmington's paper on "The Specific Gravity and the Actual Weight of Certain Volume Measures of Various Liquid Preparations," set me inquiring on the subject of the volume occupied by salts when dissolved in water.

The statement credited to the President by the reporter of the Pharmaceutical Journal is to this effect, "That the contents per oz. were coincident with the specific gravity; for instance, lemon-juice having a sp. gr. 1·040 would contain 40 grs. of citric acid per oz., and so on, except in such cases as alum and sulphate of soda, where there is much water of crystallization. In those cases it would be half, or 20 grs. per oz."

Mr. Reynolds followed with the remark, that the same rule applied to sugar in diabetic urine, but properly qualified the assertion by the phrase "roughly speaking."

In the cases of both lemon-juice and urine, the estimation by that method must necessarily be exceedingly rough, as the variations in the proportions of other constituents affecting the specific gravity of the fluids are left out of the question entirely.

Although I have no new experiments to offer, I shall, I think, be doing some service, if I recapitulate shortly the facts I have ascertained in the course of my recent reading on this subject. It will, at least, serve to caution some who otherwise would be inclined to place too implicit reliance on the "rough methods," already referred to.

Dalton, during the latter part of his life, occupied himself with the question of solution, and derived from his experiments this supposed law, "that when a body dissolves, it will only increase the volume of the solvent in proportion to the water of crystallization it contains." His method of research involved the use of two measuring vessels, and pouring backwards and forwards, in fact, was quite incapable of giving accurate results.

This, as well as the want of general applicability of his laws, was pointed out by Hilton, whose voluneno-meter, consisting of a glass flask with a long, narrow, graduated neck, enabled the experimenter to approach more nearly to accuracy of determination. He found that whilst the theory approached correctness in the cases of desiccated sulphate of magnesia and carbonate of soda, it completely broke down in the cases of the naturally anhydrous salts, nitrate of potash, sulphate of potash, etc.

Walker found, to his astonishment, sometimes an expansion, sometimes a contraction of the whole volume of salt and water, according to the nature of the salt employed, and the strength and temperature of the solution. However, he does not appear to have commenced with very clear notions, for after repeatedly employing the terms "bulk" and "volume," he goes on to say, "I next proceeded to determine if the increase of volume had any relation to the specific gravity of the different substances, or if, when a known weight of salt was dissolved in water, the increase of volume was in proportion to the volume, as indicated by the specific gravity, and if so, the salt would dissolve without either expansion or contraction." Did he really expect an ounce of sulphate of magnesia, for instance, to occupy the same space as an ounce of water!

This method involved the use of a volumenometer. The one employed was not so well adapted for the attainment of accurate results as that of some other experimenters, but was, on the whole, far superior to that of Dalton.

Nitrate of potash was the first salt employed in testing the value of his new idea. The specific gravity of nitrate of potash being, according to his determinations, 2·074, one hundred grains of the salt would occupy the space of 48·21 grains of pure water. The calculated specific gravity would therefore be found thus,—100 grs. of salt being dissolved in 500 grs. distilled water—

$$\frac{100 + 500}{48{\cdot}21 + 500} = \frac{600}{548{\cdot}21} = 1{\cdot}0944.$$

But the specific gravity ascertained by experiment was 1·1100, showing, according to him, a condensation amounting to 6·22 grain measures.

I certainly cannot deduce this amount from the data given, but make it 7·7 gr. m. However, the principle being established, it becomes possible when the ratio of condensation of a salt is known, to calculate the specific gravity of a solution within certain limits of accuracy—those limits being defined by temperature and degree of dilution.

The effect of dilution as exemplified in the case of a saturated solution of nitrate of soda is shown to be the following:—

If to 430 gr. m. of a saturated solution 60 gr. m. of water be added, the mass will suffer a decrease of volume of 1 gr. m. Sulphate of magnesia behaves in the same manner, and to the same degree. Nitrate of potash suffers a diminution of ·5 gr. m., muriate of ammonia ·25 gr. m. under the same circumstances.

From a long and laborious paper by Messrs. Playfair and Joule, describing a series of experiments undertaken in order to ascertain whether there really existed any similarity between solid and gaseous combinations, in respect of the law of equal or multiple proportions observed first by Gay-Lussac in the case of gases,—I propose to select those facts only that seem to have some pharmaceutical interest, and are possibly capable of practical application, omitting reference to the theoretical deductions therefrom further than to say that they have since been roughly handled by Professor Marignac, of Geneva, whose criticisms appear to me to well deserve consideration.

The volumenometer employed differed from that used by Holker, in that it had a tubulure in its side for introduction of salt, fitted with a ground-glass stopper. This admitted of the stem being of smaller diameter, and enabled the experiments to be attended with greater accuracy.

Unfortunately, however, the experimenters, whilst acknowledging the disturbing effects of temperature and dilution, seem to have adopted no systematic method of procedure as to the one or the other, unless it be true that the particular temperatures and dilutions adopted were selected because the results so obtained accorded best with certain theories sought to be established. This Professor Marignac evidently points at, though he does not actually affirm it.

I may mention the case of sugar as being especially interesting to the pharmaceutist. The volume occupied by an equivalent of this substance = 172 grs., varies according to dilution between 99·00 and 108·06 grm., as follows:—

Ratio of Sugar and Water.	Temp.	Vol. in gr. m. of 172 gr. Sugar.
1 : 20	60	99·00
1 : 10	52	105·09
1 : 1	52	107·01
3 : 1	52	108·06

The temperatures here even are not uniform. I may observe that when the ratio is 1 : 1, the sugar occupies a volume very nearly co-incident with that due to its specific gravity 1·606.

The investigation included the determination of a vast number of specific gravities and solution volumes of salts of every description. In compiling the following table I have selected a few only of special interest, considered pharmaceutically. The specific gravities are, in general, not those of Playfair and Joule, but those obtained by H. Buignet through the use of the Air Volumenometer invented by Regnault; and therefore, I consider, more worthy of acceptance. The term "specific gravity in solution," I employ simply to designate the weight of the solvend in air divided by the space it occupies in the solvent:—

Name of Salt.	Sp. Gr. in Air.	Sp. Gr. in Watery Solution.
Sulphate of Copper	2·302	2·77
" Soda	1·471	1·76
Biborate "	1·692	2·085
Chloride of Calcium	1·68	1·98
Potash Alum	1·757	2·135
Ammonia	1·653	2·00
Carbonate of Soda	1·463	1·58
Sulphate of Magnesia	1·675	1·96
" Iron	1·902	2·22
Nitrate of Potash	2·126	2·80
" Soda	2·265	3·22
Chloride of Potassium	1·986	2·80
" Ammonium . . .	1·55	1·50
Bromide of Potassium	2·65	4·10
Iodide "	2·97	3·77
Chloride of Sodium	2·145	3·21
" Barium	3·081	4·42
Chromate of Potash	2·68	5·60
Bichromate "	2·624	3·35
Carbonate "	2·10	7·54
Bicarbonate "	2·18	3·00
" Soda	2·165	4·70
Oxalate of Ammonia	1·47	2·00
Sugar	1·606	1·608

Bearing in mind the irregularity that seems to attend all bodies, and mixtures of bodies, on the verge of change of state, and, therefore, confining oneself to solutions of mean condition, neither extremely strong nor excessively weak, it is possible by means of this table to ascertain beforehand, with tolerable accuracy, the effect of mixing definite quantities of a salt and water, and *vice versâ* of determining the proportions of both salt and water necessary to produce a given specific gravity. Thus taking the case of sugar,—what will be the specific gravity of a solution containing equal parts of sugar and water? The volume of the water will, of course, be 1, the volume of the sugar $\frac{1}{1{\cdot}608}$, the total volume being 1·6218. Dividing the total weight = 2 by this, we get the specific gravity = 1·23. According to the table in Watts' 'Dictionary,' the specific gravity of a solution containing 50 per cent. of sugar is 1·2166 at the temperature 63·5°. Proceeding in the same way with chloride of sodium, we get for a solution containing 20 per cent. of salt the theoretical number 1·159, the experimental number being 1·1511.

Sulphate of magnesia gives for a 30 per cent. solution

1·172 theoretically, 1·1536 experimentally, the temperature in the latter case being 72·4° instead of 60°, which accounts, doubtless, for the comparatively large discrepancy. A solution of specific gravity 1·72 would, at that temperature, contain 33·5 per cent. of salt.

To determine the necessary proportions of salt, or other soluble substance, and water in order to produce a given specific gravity is not quite so simple. In order to avoid having two unknown quantities, we will assume the quantity of water to be known. Let it be 10. It is required to ascertain the quantity of sugar necessary to produce with that amount of water a syrup having the specific gravity 1·20. The specific gravity of the water is, of course, 1·00: the specific gravity in watery solution of sugar 1·608. The symbol x represents the unknown quantity we have to ascertain. Then

$$\frac{10}{1} + \frac{x}{1 \cdot 608} = \frac{10 + x}{1 \cdot 2} = 7 \cdot 89$$

i. e. to produce a syrup of specific gravity 1·20, 7·89 parts of sugar must be added to every 10 parts of water. Such a syrup ought theoretically to contain 44·1 per cent. at 60°. According to the table in Watts' 'Dictionary,' a syrup of specific gravity 1·2057 at the temperature 63·5 should contain 45 per cent. of cane sugar.

The theoretical considerations involved in the phenomena of solution are so numerous and interesting, that I propose some day to resume the subject I have now merely scratched on the surface, as it were; in which case I will ask again to be permitted to bring the subject before the notice of the Pharmaceutical Conference.

The Chairman said that this was a very interesting paper, and confirmed some of the views he held on the same subject.

Preservation of Meat.

Dr. Paul, F.C.S., said he was surprised to find himself put down as announced to read a paper on the preservation of meat. He had no intention of doing so, and all he had to give was a merely verbal narrative as to a new method of dealing with meat, which he had recently had an opportunity of studying. Every one present would be aware that in the only successful mode of dealing with South American meat,—in the preparation of Liebig's extract,—the great mass of the feeding portion of the meat was wasted; in fact, instead of producing food, they merely produced a material which was a kind of stimulant, the whole of the fibrine and albumen being lost. Some experiments had been made by the inventor of a process to which he would now refer, with the object of drying the meat by pressure; and he had found, what a great many other people had found who had endeavoured to express from any organized structure the water or liquid it contained, that he could only succeed very imperfectly. However, Mr. Henley, the inventor of this method, had, by submitting meat to hydraulic pressure, succeeded in removing from it about one-half of the juice contained in the tissue. That juice was a liquid containing the constituents of the ordinary extract of meat made on Liebig's plan of infusing the meat in water, and it also contained all the soluble albumen. Its specific gravity, as it ran from the hydraulic press, was about 1030, and it yielded on evaporation about 8 per cent. of a perfectly dry residue. Of that residue, five parts out of the eight were albumen; and if the juice were heated up to about 100°, to coagulate the albumen, they got a pale liquid which might be boiled down, and then gave as residue the ordinary extract of meat. Another plan of dealing with this expressed juice was to evaporate it at such a heat as would not coagulate the albumen, and adding a small quantity of gelatine: it could then be converted into portable soup, put into bladders and preserved in that condition for a great length of time. But the principal object of the process was to deal with the residual pressed meat, from which half the juice and half the water had been expressed, and also about half the soluble albumen and other constituents contained in the ordinary extract of meat, so that the residual pressed meat was actually richer in nutritive constituents than the original meat. If this pressed meat were submitted to further drying by heat, it might be reduced to a state in which it would contain about 10 per cent. of moisture, and meat in that state would keep for almost any length of time. He had hoped that he might have had some samples sent down in order to let the members see what could be done with these products. There were three products—the dry beef, the prepared beef-juice and the ordinary Liebig's extract.

The Chairman said he thought that the system of preserving meat explained by Dr. Paul, if it would really keep a long time, was likely to be a very valuable one. It was supposed that Liebig's extract, of which so much was sold, was really a feeding commodity, whereas it was not so, but it acted as theine acted in tea,—it prevented waste of tissue, and consequently was rather stimulating than nutritious. But in the plan referred to by Dr. Paul, where you have still 50 per cent. of the *extractum carnis*, combined with all the nutritive ingredients of the meat, the product has more the character of a true animal food.

Mr. Hanbury (London) said that this reminded him of a subject which was brought up at a meeting of the Royal Society of London a few weeks ago, when Dr. Simpson took occasion to remark that at a large London hospital with which he was connected the beef tea was prepared so as to contain almost the whole of the solid matter of the meat. The beef was first infused, and then the meat that had been used the previous day, and from which the infusion had been strained off, was reduced to a sort of pulpy state, and mixed with the fresh infusion. It was stated that this plan produced most excellent results, and it had been in vogue for some years, to the general satisfaction of the medical officers and of the patients.

Mr. Deane (London) said he had had some experience in regard to Liebig's extract of meat. He found that after separating the matter which was soluble in water at a temperature which would coagulate the albumen, the residue was left in a very insoluble and indigestible state. He had come to the conclusion that meat fibre that had been deprived of the phosphates and chlorides that were held in the juice of the meat among the fibres could be of no manner of use, and he should therefore infer that the meat prepared by pressure, from which half the soluble salts had been removed, would be a very indigestible substance. Liebig's extract was a restorative under certain conditions, but it would be a mistako to suppose that it possessed all the nourishment of the meat from which it had been taken. When any of them found themselves exhausted, it was because the muscular system was deprived of some of its constituents, and it was a remarkable fact that when a person was so exhausted, if he got a small quantity of Liebig's extract, say half a dram in hot water, in the course of ten minutes a wonderful restoration took place. He had a suspicion that if they had the pressed meat referred to, with half of the matter removed, it would be ill for weak stomachs like his own, which required a little more of the extract. These were the chief points which he had to mention. He had paid a great deal of attention to the process, and he had instructed a gentleman who went out to the Australian Meat Company as to the proper method of preparing the extract. That gentleman went and carried out his (Mr. Deane's) instructions very generally, and the result had been very successful. In regard to cooking, there was no necessity for boiling meat or fish rapidly; for if a little time were allowed there would be better results.

Mr. Savage (Brighton) said that this subject had been under consideration for the Sussex County Hospital. The extract of meat had been used there, and it seemed to answer uncommonly well.

Professor ALLEN said he could endorse the remarks that had been made as to Liebig's extract being a stimulant. He had taken it in a glass of wine and it had a restorative effect. Some people objected to the flavour of it, and some said it had a burnt taste. He could not say that it had that taste; but he used plenty of pepper with it. He thought that the preparation of meat sold by Fortnum and Mason, Piccadilly, was uniformly prepared. It was in the form of a sausage, which was enough to make a basin of soup.

Mr. ATKINS said he had recently observed one or two striking cases of the nutritive quality of Liebig's extract. He had found that slices of toast covered with Liebig's extract were more effectual as a restorative than anything else he was aware of. He would like to know whether the opposition of the faculty to Liebig's extract was gradually yielding. There was an opinion among medical men that it was deficient in some of the important qualities required in beef-tea.

Mr. MACKAY (Edinburgh) said he could bear testimony to the value of Liebig's extract when made into beef-tea. Several very striking instances of its value had come under his own observation; and, at this moment, there were two persons he had in view who had derived great benefit from it. One was a lady advanced in life, and the other a young man, both given up by their medical men, and they were about to sink from sheer want of nourishment. They had taken a dislike to everything that was named to them, and at length it was suggested to them that they should take Liebig's extract, from which they got the greatest advantage. He had often heard medical men speak of the stimulating and nourishing effects of the extract. He had known cases of gentlemen who were out on the moors, and by spreading a biscuit or toast with the extract, it had enabled them to go through almost any amount of fatigue.

Professor WRIGHT said that the prevailing opinion was that the extract did not do so much to prevent muscular waste as to enable the digestive organs to act more perfectly on the food materials and cause less waste than would be the case were the semi-alkaloids not present.

Mr. COLLINS (London) said that a friend of his travelling in South America never went out without Liebig's extract; and when he was exploring there was nothing which gave him so much strength. He was sometimes days without any other food whatever.

Mr. SCHWEITZER (Brighton) said he had made some beef powder. It had the same appearance as coagulated albumen, and nothing would soften it.

Dr. PAUL then replied. He said that as to the preparation of Fortnum and Mason, he believed it was a kind of portable soup, made by partial evaporation of beef juice and the addition of a little gelatine. It was not his intention to speak of meat extract as a stimulant. Taking small quantities of extract of meat when a person was working hard might for a time sustain him, but that was no proof that it was food. He might be living on his own body. It was true that the pressed meat was not to be compared with a fresh beefsteak, but that was not the question at all. All meat-preserving methods were intended to utilize a quantity of meat that would not otherwise be used. It had been pointed out by Liebig that one of the greatest defects in preparing his extract was that it left the great mass of the animal utterly worthless. It required thirty pounds of beef on the average, and of the better parts, to produce one pound of the extract, and the other twenty-nine pounds were entirely waste. The real way of considering the method he had brought under their notice was to compare it with the other methods intended to attain a similar result. It might well be that since the pressed meat contained less of the juices than fresh meat, it might be less digestible and less valuable as food, but that was still more the case with salt junk. He thought that this new method of dealing with meat was one worth attention and observation, whatever might be the actual nature of the results.

PROTECTION TO BOTTLERS.

Mr. BAILDON (Edinburgh) then exhibited a guard to be put upon bottles, for the protection of men engaged in bottling aerated waters. He had no doubt this ingenious contrivance by Mr. Fraser would be interesting. It was a very efficient protection to the bottlers, who often had their hands and arms severely cut. He had had practical experience of the plan himself, and he could say that it was very simple and afforded very efficient protection.

The Conference adjourned at four o'clock, to meet next day at eleven.

Wednesday, August 2.

The Conference met on Wednesday morning at eleven o'clock; Mr. STODDART presiding.

Mr. HANBURY read a paper on—

THE CRYSTALLINE PRINCIPLES IN ALOES.

BY DR. F. A. FLÜCKIGER,

Professor of Pharmacy and Pharmacognosy in the University of Bern.

A large sample of *Natal Aloes*, a variety of the drug remarkable for its opacity and pale tint has been presented to me by my friend Daniel Hanbury. Thin fragments of it are so little translucent as to show but a faint brown colour. The fracture of large lumps exhibits a dense conchoidal surface of a dull greyish brown or drab, marked with a few yellowish veins, and quite devoid of the brilliant vitreous gloss exhibited by newly broken Cape aloes.

Fragments freely moistened with spirit of wine, when examined microscopically especially in polarized light, are seen to consist of numerous crystals imbedded in a yellowish amorphous mass which is readily soluble. Mr. Hanbury first observed that the crystals on the other hand are but sparingly soluble and that when the crude drug is treated with spirit of wine they separate as an almost whitish deposit; he consequently suggested they might be something different from aloïn. These crystals as they occur in Natal Aloes, are not well defined; most of them are thin, short prisms, sometimes tufted, as in aloïn from hepatic Aloes. Sometimes also single, tabular, probably rectangular crystals are met with, as may be seen by gently crushing a fragment of the aloes with glycerine between two glass-slides.

There is no difficulty in separating the crystals from Natal Aloes. If the drug is rubbed with an equal weight or a little less, of spirit of wine at a temperature not exceeding 120° F., the amorphous portion of it is dissolved. The remaining crystals may be collected on a filter and washed with a small quantity of cold spirit. From 16 to 22 per cent. of crude pale yellow crystals can thus be got.

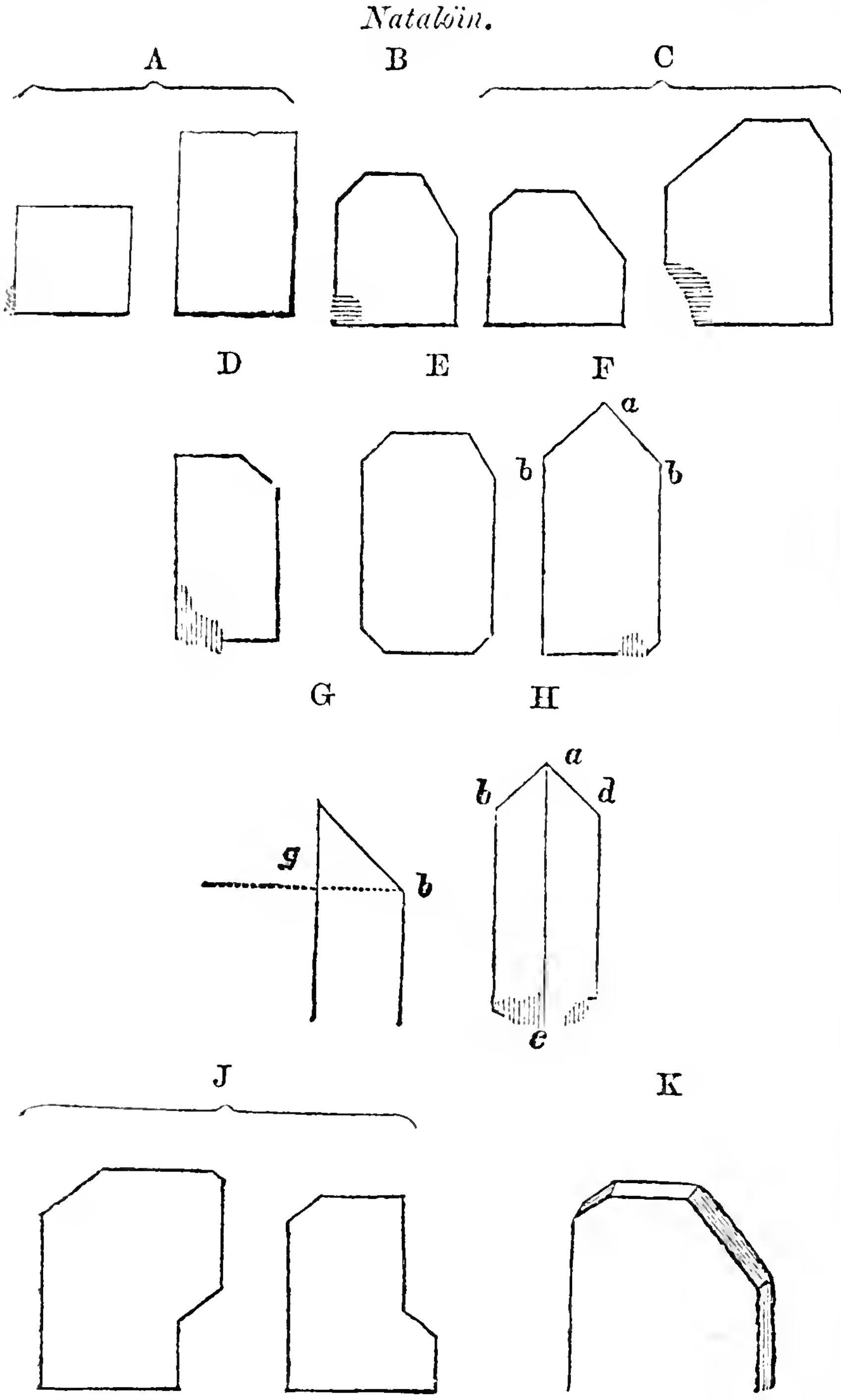
The difficulties begin when the purification of the crystals has to be effected. For this purpose I have tried the usual solvents without discovering any liquid that is thoroughly convenient for dissolving my *Nataloïn*, for by this name I propose to designate the substance. Neither water, benzol, bisulphide of carbon, petroleum-ether, chloroform, or ether, is capable of dissolving nataloïn in appreciable quantity. A mixture of ether (1 part) and spirit of wine (3 parts) succeeds a little better; the same may be said with regard to anhydrous aceton, methylic and amylic alcohol, glacial acetic acid and acetic ether. After all however, I do not feel convinced of the advantage of any one of those solvents over common spirit of wine, of which 70 parts dissolve at about 60° F., one part of nataloïn, or of the above-named mixture of ether and spirit, 60 parts; while of methylic alcohol 35 parts, of acetic ether 50 parts, of ether 1236 parts and of absolute alcohol 230 parts, are respectively required for dissolving one part of nataloïn.*

Nataloïn in small crystals is rather more intensely yellow than flowers of sulphur; larger crystals display a somewhat orange tint. Its taste is pure bitter, neither a sweetish nor an acrid after-taste being observable.

In warm or hot spirit of wine nataloïn is scarcely more soluble than in cold. By heating the liquid even gently, it quickly turns darker, assuming a red colour, so that some decomposition is evident, nor can it be wholly avoided by evaporation *in vacuo*. The best method of recrystallizing seems to be that of heating the nataloïn with 60 or 70 parts of spirit of wine to 100–120° F., and allowing the solution thus obtained to evaporate spontaneously during several weeks; in this way may be got crystals of $\frac{1}{3}$ to $\frac{1}{2}$ a millimetre long.

The crystallographic features of nataloïn are very characteristic. The small, first-deposited crystals as well as the larger ones, always consist of extremely thin and brittle scales, not resembling the crystals originally found in the drug. The most perfectly developed crystals of nataloïn are square, or at least rectangular scales (A),

Nataloïn.



A crystallised from absolute alcohol.
B, C, D, E, F, J from spirit of wine, slowly grown.
G, H quickly separated from spirit of wine.
K from acetic ether.

but two of their angles are usually more or less truncated (B). The amount of truncation of the angles is usually not the same on both sides (C), and is even sometimes restricted to one only (D). Crystals having all their four angles truncated are rarely met with (E), and pointed scales like F are still more exceptional.

Nataloïn which has been quickly deposited from a warm alcoholic solution shows a predominance of the form indicated in fig. G, and sometimes also in fig. H which is striated lengthwise. The latter seems therefore to be rather a combined figure than an individual crystal.

If the scales H are examined in polarized light, the two parts namely *a b e* and *a d e* are sometimes manifestly different in the direction of their refracting power,* which in nataloïn is always very brilliant. Finally there are also found irregularly developed crystals (J).

The crystals of pure nataloïn being usually so small, their angles can only be measured approximatively by means of the micro-goniometer. Some estimations not quite satisfactorily ascertained, furnished me 82° for the angle *a* and 139° for angle *b*. The crystals are easily broken according to their longitudinal direction, *a e* for instance in fig. H, yet still more so in a direction parallel to their surface. If an alcoholic solution evaporates very slowly, tabular crystals of appreciable thickness can be obtained, yet in a less pure state. If they happen to be a little injured, their longitudinal edges exhibit a distinct lamellar structure as shown in fig. K. Crystals of this kind are chiefly formed from a solution in acetic ether. An alcoholic solution yields mostly regular square scales.

Nataloïn gives off no water when exposed over concentrated sulphuric acid or when heated to 212° F., in either case even for some days; and this behaviour shows at once that it is not identical with the aloïn discovered by Messrs. Smith of Edinburgh and examined by Dr. Stenhouse. According to this chemist, crystallized aloïn parts with 2·69 per cent. of water when dried over sulphuric acid, and entirely loses its crystalline aspect when kept for some days over a waterbath. Nataloïn is not even altered or its weight diminished if it is heated to 284° F. Decomposition begins to take place only towards 320° F. when the nataloïn turns greyish; the temperature named having been maintained for many hours, the loss of weight amounted only to 3·8 per cent. At 356° to 374° F., nataloïn fuses becoming previously of a dark, brown red, but it is still partially crystallizable as may be ascertained by treating it with solvents.

Nataloïn is soluble in concentrated sulphuric acid; the orange liquid yields a precipitate by addition of a small quantity of water, but the dingy colour of the nataloïn so obtained probably shows that partial alteration has taken place. If the vapour of fuming nitric acid is cautiously directed on to a solution of nataloïn in sulphuric acid, the latter acquires a fine green colour, quickly changing to red and blue. This very intense and distinctive reaction which was first pointed out by Mr. Histed, may be illustrated as well by rolling a crystal of saltpetre in the sulphuric solution. A small grain of chlorate of potassium produces a brilliant green zone, almost instantaneously disappearing. Nitrate of bismuth gives nearly the same effect. Bichromate of potassium acts in a similar manner as with strychnine only that the colour is less pure. *Natal aloes* being so rich in nataloïn, itself displays these reactions by which in fact, it may be easily *distinguished from* the *aloes* of the *Cape, Zanzibar* or *Barbados*.

By heating nataloïn with nitric acid of about sp. gr. 1·3, to 140°–160° F., a red solution is obtained which at length turns yellowish as the nataloïn slowly disappears. But I have not been able to discover in this liquid either picric or chrysamminic acid, yet the latter according to

* Mr. Edward Histed of London who has been occupying himself also in the examination of Natal Aloes considers methylic alcohol to be by far the best solvent for nataloïn.

* This however may quite as well be due to the occasional superposition of extremely thin scales.

Stenhouse is formed when aloïn and nitric acid are heated together. Nataloïn yielded me only oxalic acid.

I have made five analyses in order to ascertain the elementary composition of nataloïn. By burning it in a current of oxygen—

I. 0·2025 gramme yielded 0·4380 carbonic acid and 0·1125 water.

II. 0·2450 gramme yielded 0·5325 carbonic acid and 0·1372 water.

III. 0·2288 gramme yielded 0·5135 carbonic acid and 0·1215 water.

IV. 0·2605 gramme yielded 0·5578 carbonic acid and 0·1395 water.

V. 0·1598 gramme yielded 0·3525 carbonic acid and 0·0898 water.

These results answer to the following percentages:—

	I.	II.	III.	IV.	V.
Carbon .	58·99	59·14	61·18	58·38	60·15
Hydrogen	6·17	6·24	5·92	5·95	6·24

The average numbers of these would be

Carbon	59·56
Hydrogen	6·10

The crystals analysed were taken from different crops and dried at 212° F., except those burnt in analysis V. The latter were the purest and largest crystals I have ever obtained; I dried them some days over sulphuric acid, and then exposed them to 212° F. only for a short time. The analysis of these crystals appears to me, on the whole, to be the most trustworthy; its results would lead to the formula $C_{34}H_{38}O_{15}$, viz:—

34 C	408	59·47
38 H	38	5·54
15 O	240	34·99
	686	100·00

Both the analysis V., as well as the general average agree tolerably well with this formula. Now the same formula is assigned by Stenhouse to his crystallized hydrated aloïn. Deprived of the molecule water H_2O, anhydrous amorphous aloïn of Stenhouse contains carbon 61·07, and hydrogen 5·39, with which only my analysis III. would agree. There is, however, one fact perhaps, which might speak in favour of the *higher* percentage relating to carbon,—that is the composition of the *drug* itself, which I found to be *less rich* in carbon than its crystalline principle. I submitted 0·2645 gramme of Natal aloes (dried at 212° F.) to elementary analysis equally by means of oxygen, and obtained 0·5365 carbonic acid and 0·1385 water. The drug consequently contains 54·63 per cent. of carbon and 5·80 of hydrogen.

Stenhouse in assigning the above formula to crystallized aloin, or rather $C_{34}H_{36}O_{14}$ to the anhydrous aloïn, was well entitled to do so by the existence of the crystallized bromine compound $C_{34}H_{30}Br_6O_{14}$, which he discovered. Yet as to the nataloïn, I have failed to obtain a well defined bromine compound. If bromine is added to nataloïn, heat is evolved and bromine evidently absorbed. The orange mass then proves much more readily soluble in spirit of wine than nataloïn, and also in methylic alcohol; but the solutions yield no crystals, either by slow evaporation, or on addition of water. I further enclosed in a sealed tube nataloïn with a sufficient quantity of bromine and heated the tube for many days at 212°, but notwithstanding the partial absorption of the bromine, this method too proved not more satisfactory. I have, therefore, not further examined the bromine compound. Iodine appears to be incapable of uniting with nataloïn.

Some crystallized compound or well defined product of decomposition of nataloïn would alone afford the facts for settling its formula. After the unpromising trials with bromine and iodine I have attempted to arrive at better results by boiling nataloïn with dilute sulphuric acid. This was done in a tube previously filled with common illuminating gas and then sealed in order to exclude the influence of air. The liquid nevertheless turned dark purplish; it was slowly evaporated after it had been saturated with carbonate of barium. A new body then made its appearance, consisting of colourless very thin feather-like crystals. But this body was always formed in a very trifling quantity only, so that I have not been able as yet to isolate it;* it dissolves in methylic alcohol and all the above liquids as well as the accompanying products of decomposition. A similarly unpromising result was obtained by gently warming zinc, dilute acetic acid and nataloïn. The latter then becomes greenish and is at last dissolved; if the zinc is separated by means of sulphuretted hydrogen, the liquid, on evaporating, turns likewise purplish, tastes no longer bitter, but gives only traces of a crystallized body resembling that formed by the action of dilute sulphuric acid.

By a mixture of nitric and sulphuric acids, both concentrated, no available compound of nataloïn is formed.

In alkaline liquids nataloïn is also soluble, but very quickly darkened; by dry distillation, yellow or brown oily acid liquids are produced, which are devoid of any peculiar aromatic odour.

The whole of the foregoing facts do not yet allow us to form an idea of the constitution and the true chemical nature of nataloïn, but they are sufficient to prove that it is a new body, certainly differing from the aloïn hitherto known, although in percentage composition there is no considerable discrepancy between the two principles,—probably none at all.

I have also received from London some aloes which I am informed had been imported from Zanzibar, and was offered for sale in 1867. This drug is of a pallid reddish-brown hue, and so highly crystalline that it might fairly be termed *crude aloïn*. Mr. Hanbury is of opinion that it is not distinct from the so-called *socotrine aloes*, but that it is formed by the spontaneous drying up of the more crystalline portion which settles down when fluid socotrine aloes is allowed to repose. He assures me further that he has noticed that the solid Zanzibar aloes which is imported, though but rarely, in skins, is partly glossy and transparent, and partly highly crystalline.

Whatever may be the true facts, the crystals of the Zanzibar drug are comparatively large prisms such as I have never observed in, nor obtained from Natal aloes, and the pale, dull liver colour of the latter is extremely dissimilar to the reddish hue of the Zanzibar sort. The crystals of Zanzibar aloes cannot be so easily isolated as nataloïn, because their solubility approaches much nearer that of the amorphous part of the drug. They may, however, be obtained by water or dilute alcohol in the manner pointed out in the several papers of Stenhouse, Smith, and Groves, for the preparation of aloïn. Mr. Histed, who has been kind enough to send me some good quantities, obtained his crystals by moistening the powdered crude drug with alcohol sp. gr. ·960, and strongly pressing the pasty mass in several thicknesses of calico;—then dissolving the yellowish crystalline residue in warm, weak alcohol, collecting the crystals which form by cooling and repose, and purifying them by recrystallization.

Aloïn from Zanzibar aloes is usually less bright in tint than nataloïn, the crystals being smaller and not well developed. The crystallographic character of Zanzibar aloïn is different from that of nataloïn, the former consisting of what I cannot as yet better designate than as *tufted needle-shaped prisms*. The best solvent for them appears to be methylic alcohol, from which I find that very good crystals, 2 to 3 millimetres long

* Perhaps one of the products of decomposition of aloes, alluded to by Rochleder in 1861 and 1863?

and nearly 1 millimetre broad can be obtained. Zanzibar aloïn is much more soluble than nataloïn. At ordinary temperatures 30 parts of spirit of wine, 9 parts of acetic ether, 380 parts of (sulphuric) ether, and 90 parts of water are capable of dissolving respectively one part of the said aloïn, while in methylic alcohol it is most abundantly soluble. These numbers sufficiently illustrate the dissimilarity of the bodies under examination. But there are yet other points of difference. In concentrated sulphuric acid, Zanzibar aloïn is soluble; but on addition of an oxidizing substance as nitric acid, no alteration of the yellow colour of the liquid takes place, as when nataloïn is similarly treated.

The taste of the two substances is a little different,—Zanzibar aloïn imparting at first a slight sense of sweetness (quickly followed by pure bitter) not perceptible in nataloïn.

Again, the Zanzibar aloïn contains water, which it gives off over concentrated sulphuric acid. The air-dried substance lost in several days from 11·7 to 12·4 per cent., and on exposure to the open air again absorbed slowly about the same quantity of water. This air-dried aloïn kept at 212° F. for ten days lost 14·5 per cent.; the loss of weight amounted to only 13·2 per cent. if it was heated at 320° (160° C.) for some hours only. I have repeatedly performed these experiments relating to the amount of water which is contained in the air-dried substance, because it is again very different from Stenhouse's statements concerning his aloïn. His aloïn $C_{34}H_{19}O_{15}$ (old way of writing) loses only 2·69 per cent. of water, when dried at 212° F. for some hours, and not 11 to 12 per cent. like mine obtained from Zanzibar aloes.

Yet, as to the elementary composition, that of my *anhydrous* substance agrees with that of Stenhouse's *crystallized* hydrate as nearly as possible. He gives the following numbers * for aloïn dried *in vacuo*:—

		Calculated.	I. analysis.	II.
34 C	2550·0	59·47	59·39	59·24
19 H	237·5	5·54	5·97	5·79
15 O	1500·0	34·99		
		100·00		

On the other hand, 0·2108 gramme of the aloïn prepared by Mr. Histed from Zanzibar aloes, which I dried three days over sulphuric acid until its weight was no longer diminished, yielded me 0·4576 carbonic acid and 0·1128 water, that is to say it contains carbon 59·20, and hydrogen 5·94.

Thus, adopting the *new atomic weights*, we have—

		Calculated.	Stenhouse. (Average.)	Flückiger.
34 C	408	59·47	59·3	59·2
38 H	38	5·54	5·9	5·9
15 O	240	34·99	—	—

But Stenhouse admits his aloïn to contain 1 mol. of water and consequently assigns to it the formula $C_{34}H_{36}O_{14} + H_2O$, whereas my analysis relates to a body, which, as it has been dried over sulphuric acid, I regard as anhydrous. By the heat of the steam bath it further loses about 3 per cent., but I think this loss rather depends upon decomposition, the substance assuming a somewhat darker coloration. These suggestions are confirmed by the above statements, which showed that air-dry aloïn from Zanzibar aloes loses over sulphuric acid 11 to 12 per cent. of its weight. If we suppose, as we are well entitled, this loss to consist of water, we may then attribute to my substance, air-dried, the formula $C_{34}H_{38}O_{15} + 5\ H_2O$; it would require 11·59 per cent. of water, a number closely enough agreeing with my actual observations, as has been shown.

I have been unable to prepare from the Zanzibar aloïn the crystallized bromine compound (bromaloïn) which appears so easily obtainable from the aloïn of Barbados aloes.

The reaction of nitric acid on the two aloïns is also distinctive,—with the latter a deep red colour being produced, which is not manifested by the former, or by nataloïn.

All these facts lead to the conviction that the aloïn extracted from Zanzibar aloes is not only distinct from nataloïn, but also from the aloïn obtained by Messrs. Smith from Barbados aloes. I have nevertheless not yet thought it convenient to give another name to aloïn furnished by the Zanzibar drug, still further investigation being desirable.

One fact, at all events, results from the above researches, namely, that there occurs in aloes more than one crystalline principle.

* *Phil. Magaz.* xxxvii. (1851) 481 *et seq.* Gmelin's 'Chemistry,' xvi. (1864) 461.

Parliamentary and Law Proceedings.

The Alleged Attempt to Poison by a Lady.

At Brighton, on Thursday, August 24, Christiana Edmunds was brought up on remand, charged with having attempted to administer poison to Mrs. Emily Beard, with intent to commit murder.

The first witness was Emily Agate, a cook in the service of Dr. Beard, who said she recollected a cake being brought down into the kitchen. She ate a piece of it, and in about an hour and a half she felt giddy and sick, with a hot sensation in her throat, and afterwards had diarrhœa.

Adam May, a little boy, eleven years of age, who was identified as having been seen with the prisoner, said, about five or six weeks previously a lady asked him to go an errand for her. She went with him till they were opposite to Mr. Garrett's, when she sent him in with a note. Mr. Garrett gave him a book, which he brought to the lady, who was waiting for it.

Mrs. Cole said that about a week previous to the inquest on the boy named Barker, the prisoner called at her shop and made a small purchase. After she had left witness found a bag with Mr. Maynard's name printed on it, lying in a pail near the counter. On opening the bag she found some chocolate creams, and a smaller bag with three lemon bulls'-eyes. She and her daughter ate the bulls'-eyes. Her daughter also put a piece of one of the creams in her mouth, but spat it out again. The creams were put aside, and next day were given to a little boy named Walker, the son of a customer. On a previous occasion,—in March, she believed,—the prisoner had made a purchase in her shop, and after her leaving, witness had found a bag of chocolate creams on the counter. These were eaten by her daughter and another person. She saw the prisoner at the inquest on the boy Barker, and recognizing her, asked her whether she had dropped any chocolate creams in the shop. The prisoner denied having dropped any.

Mrs. Walker said she remembered her son bringing home some chocolate-creams about the middle of June. She ate a piece of one about the size of half a walnut. About ten minutes afterwards she felt a sensation in her head as if her eyes were coming out; something seemed to strain them. She got a glass of water, but was unable to put it to her mouth, on account of her hands and arms shaking so. Her legs and arms were convulsed. With great effort she got upstairs, but was quite unable to reach the door to call for help. She did not notice any unusual taste to the cream at first, but when she turned the brown part over in her mouth, it had a bitter taste that remained in her mouth a whole day. She recovered without medical attendance.

William Moon, eleven years and a half old, said that on July 19th, the prisoner asked him to go to Mr. Garrett's, in the Queen's Road, with a note. He gave the note to Mr. Garrett, who gave him in return what appeared to be a letter; this he took to the prisoner, who was waiting for him at the bottom of Upper North Street.

Mr. Isaac Garrett, chemist, at 10, Queen's Road, said he had known the prisoner as a customer for about four years. She only called in occasionally till the beginning of this year, when her visits began to be more frequent. She purchased generally toilet articles, such as soap, etc., and also quinine and iron mixtures. She usually came between nine and ten in the morning, and frequently made observations about the weather being cold for riding, having to return by the next train, etc. On March the 28th, after buying some toilet articles, she asked if he could supply her with a small quantity of strychnia to destroy some cats with, as her garden was very much infested with them, and she and her husband wished to get rid of them in this way. Witness objected to supply her. He said it was such a potent poison that he did not care to supply anything of the kind. Prisoner said she would give it straight into her husband's hands, and as they had no children no harm could possibly come of it, for she would be very careful. Witness then told her he could not supply her unless it was in the presence of a witness, who must be well known to both of them. She said the only person in the neighbourhood that she was acquainted with was a Mrs. Stone, with whom she was in the habit of dealing. Mrs. Stone lived three doors from him, where she then kept a milliner's shop, and he requested the prisoner to bring her. He then served her with the strychnia, and she signed his poison register book (produced), "Mrs. Wood, Hillside, Kingston," and Mrs. Stone signed it as a witness. The quantity of strychnia sold to her was ten grains. The prisoner called in at the shop several times between March 28th and April 15th to make purchases. She was taking quinine at the time. Witness had flowers in his shop, and she frequently made observations about her garden. She asked him if he was fond of asparagus, and brought two bundles on two separate occasions. She came into his shop on April 15th. She said the cats in her garden were quite as numerous and destructive as ever, and that the strychnia had apparently had no effect on them. She then asked him to supply her with more. He told her that he was very particular and anxious about it, and she repeated what she had said previously as to her having no children, and that no harm could therefore arise from it. He told her that he should require a witness to sign the register as before. She fetched Mrs. Stone as a witness again, and he sold her another ten grains of strychnia. He filled up the entry in the book (produced), and the prisoner signed it. He saw her on several occasions between that time and May 11th. She said that she was still taking the quinine and iron which she bought of him, and also that she and her husband were about to leave Kingston and go to Devonshire to reside. She also said that she should call before she left to have a supply of the quinine and iron mixture, as it had done her so much good. On May 11th she came to fetch the supply of quinine and iron which he had prepared. She then asked him to supply her with a little more strychnia to kill a dog, which she stated to be so very old and diseased her husband could not take it with him, and did not wish to leave it behind. He then cautioned her strongly again against the use of strychnia; but, ultimately, supplied her with it without a witness, but she signed the book as before in his presence, omitting, however, the address. The quantity was the same as on the previous occasions, ten grains. He did not see her after this till Friday last, when she was on trial, and that was the first time he heard her proper name.

Mrs. Stone said that she carried on the business of a milliner. In March last a lady, whom she believed to be the prisoner, but was unable to swear to, as she was so closely veiled, made a purchase at her shop. About five minutes after she returned and asked her, as a great favour, if she would oblige her by going into Mr. Garrett's to sign her name as a witness, as she wanted some poison to stuff birds, her husband and herself being naturalists. Witness hesitated for some time, and asked her for her name and address. She said her name was Mrs. Wood, and that she resided at Kingston. She said not the slightest harm would result from her being a witness. At last witness consented to go with her. Witness said to Mr. Garrett, "What have I to do?" He said, "You have to sign your name here." She said, "I hope I am not going to sign my death warrant." Mr. Garrett smiled, and replied, "It is only a form which is obliged to be filled up since the new Act, which must be signed by some householder." No entry was made in the book either by Mr. Garrett or the lady while witness was there. She did not pay much attention to the book to see what was entered. She was nearsighted. Witness recollected the lady coming to her again on the 15th April. She bought another veil. She then said, "I have to thank you for doing me a favour last time, will you be kind enough to do it again, and sign Mr. Garrett's book?" Witness went with her to Mr. Garrett's and signed as before.

Mr. Garrett was then recalled, and shown a small pink box, something in the form of a collar box, but smaller. He said he received it by post on the 10th or 11th Aug. The box contained two fresh peaches. There was a piece of tissue-paper between the peaches, and there was also a piece of note-paper, containing half a sovereign. On the note-paper was written, "The last of my debt, and the first of my fruit from my garden." The person whom he knew at this time as Mrs. Wood was not indebted to him.

Mr. William Curtis deposed that he had received by post a box containing crystallized fruit. Some persons were ill through eating the fruit.

Detective Gibbs said he had received a box (produced) from the prisoner's mother, at 16, Gloucester Place, where the prisoner and her mother lodge. He had conversation with the prisoner herself about the box the same afternoon. On going into the room he found her lying on the couch. She said, "Here you are again, Mr. Gibbs, and I am nearly poisoned. You have heard that I have had a box sent me with some fruit in it. It came on Thursday evening, about half-past seven, by post. It is evident it is some one in the town, for it bears only the Brighton post-mark, and it is evident it is no one connected with me, or they would have known my address and how to have spelled my name properly, for it is written 'm-o-n' instead of 'm-u-n,' and the address is put 17, Gloucester Place, instead of 16." Witness asked her what the box had contained, and she said, "Some strawberries, two apricots, and a pair of new gloves." He asked her what she had done with them, and she said, "Mrs. Edmunds ate the strawberries and I had one apricot, and it was all right. I bit the other, and it was dreadfully bitter. I spat it all out and have been ill ever since." She asked him different questions about the other boxes that had been received, Mrs. Beard's and others. She said, "Is it true that some other boxes have been received, and that Mrs. Beard has had one?" Witness said, "Yes, also Mrs. Boys, Grand Parade, and Mr. Curtis, of the *Gazette*, North Street." She replied, "Oh, how very strange. I feel certain you'll never find it out." The prisoner appeared to be suffering from illness and looked very pale.

Adelaide Ann Friend, housemaid to Mrs. Beerling, of Albert Terrace, Margate, deposed that the prisoner slept at her mistress's house two nights. Witness saw two boxes like those produced, and opened them. One contained two peaches, and the other crystallized fruit. A third box, like that which prisoner asserted to have been sent to her, stood by the others on the table. It was empty.

Charlotte Pettit, servant to Mrs. Freeman, said the prisoner had lodged with her mistress since March.

She remembered her going to Margate. On Friday, the 4th August, witness was in the lobby looking into the garden, when the prisoner brought some powders on a waiter in packets partly undone. There were no labels, but it was evident that there had been some, which had either been torn off accidentally in opening them or purposely. She said, "Take these away." One of the powders witness thought was powdered myrrh, and therefore kept; the other she threw on the fire. The powder which she thought was myrrh she kept on the dresser, and subsequently gave to Detective Gibbs, She recollected a lady of the name of Taylor lodging in Mrs. Freeman's house. She had a favourite dog that died on May 27. The dog was ill rather more than half an hour. Prior to the dog being taken ill Miss Edmunds was with it. It was in good health previously. Miss Edmunds was with the dog about an hour before it died, and half an hour before it was taken ill. The dog before it died stretched its legs out, shuffled about, and twisted round and round, as if with a sort of choking sensation.

The prisoner was then remanded for a week.

Poisoning by Arsenic.

On Wednesday, August 23, the coroner for West Somerset held an inquest at Cutcombe on the body of Maria Norman, aged twenty-one years, who was accidentally poisoned on the Thursday previous, The following evidence was adduced:—

James Norman said he was a farmer residing at Higher-house Farm, in the parish of Cutcombe. The deceased was his daughter. On Thursday morning she went on the hill with him, and returned between nine and ten o'clock a.m., appearing very well. On his return to the house about eleven o'clock, she appeared very unwell, and his wife said she had given her some senna tea. He went on the farm again and about dinner-time returned. Deceased was then gone to bed. Whilst at dinner, Mr. Bond, a seller of oils for cattle and medicine for people, came in, and his wife told him that deceased was very ill, and at her request he saw her. He came downstairs and said there was not much the matter with her, and there was no necessity of sending for a doctor; she had wind on the stomach through taking some brimstone which we told him she had had in the morning. He asked witness to let him see some of the same sort. Witness went to the back kitchen where it was kept and brought him some of it. He looked at it and said he thought it was nothing but pure brimstone. In the course of an hour and a half he saw her again. He said "You needn't trouble about her; if you like to send for a doctor you can, but there is no need for it." Next morning, seeing that she was very ill, witness sent for a doctor. She died about 10 a.m., before he arrived. Witness continued, I produce the barrel containing the brimstone as it was left in the back house. I obtained it from Mr. Harwood, of the Crown, Exford. I sent for 10 lbs. of arsenic, 40 lbs. of brimstone, and 60 lbs. of black soap. I gave him a verbal order and received the two packets produced, each being marked "POISON" in large letters, as it is now. One packet, which I thought was arsenic, I put away; and the other was opened for use, viz. to dip the sheep in a solution of it to kill the vermin. I considered that the packet which I opened was pure brimstone, and having arsenic in the house, I made a composition of arsenic, this supposed brimstone, and black soap. It was opened in the back house, and any one could go there and take it. We have had pure brimstone from Mr. Quick for years past, and my family have been in the habit of taking it.

Ann Norman, a sister of the deceased, deposed that on Thursday morning the deceased said there was something breaking out on her arm, and her mother said, "Why don't you take a little brimstone? there is some upstairs." Deceased said there was some nearer, down in the back kitchen; and she took a cup and teaspoon, and went towards the back kitchen. Three or four hours afterwards she was taken ill.

Mary Norman, another sister, said she saw her return from the back house with something in a cup, which was the colour of brimstone, about a teaspoonful. She said, "Poll, do you think this is good?" Witness replied, "Yes." She went into the dairy, witness thought for some milk to take with it, which was their usual way of taking brimstone. The packet and barrel produced were in the back house, and witness considered it contained simple brimstone.

Dr. Norman said he had made a *post-mortem* examination of the body, the appearance of which he described. He took away a portion of the powder from the packet in the barrel produced, and a portion of vomited matter which he was told the deceased had vomited just before she died. He sent these under seal to Mr. Stoddart, of Bristol, with a request that he would analyse them. Mr. Stoddart reported that he found the yellow powder to be a mechanical mixture of white arsenic and sulphur. The liquid in the bottle was milky-looking, and under the microscope was full of small globules of oil. It also contained arsenic in solution in considerable quantity. Witness was of opinion from this report and the *post-mortem* appearance, that the deceased died from inflammation of the stomach from taking arsenic. He should think there would be twenty grains in a teaspoonful of the compound.

The coroner then carefully summed up the evidence to the jury, who returned a verdict "That the deceased took a quantity of a compound containing arsenic in mistake for simple brimstone, by means of which she became poisoned by the same arsenic, which produced inflammation of the stomach, of which she died."

The coroner remarked that the packet being marked "Poison," the father ought to have been more particular in placing it in a secure place, and that such a virulent substance, having all the appearance of brimstone, ought to be coloured by those who had the sending it out. He was not sure whether some Act of Parliament did not compel persons to do so.

Obituary.

WILLIAM FLOCKHART.

We regret to announce the sudden death of this gentleman, at his residence, Annacroich, Kinross. Mr. Flockhart had been in his usual health until recently, but on Wednesday was seized with a severe attack of stomach cramp. Eminent medical aid was summoned from Edinburgh, but he never rallied, and died at ten o'clock on Thursday morning. Few names are better known in pharmacy than the eminent firm of Duncan, Flockhart and Co., of which the deceased was one of the original partners. Professor Christison, in his 'Dispensatory' (a volume now "scarce") acknowledges the valuable aid and information, as well as many selected specimens of pharmaceutical products, for which he was indebted to this firm; and the late Professor Sir James Y. Simpson owed much of his early success in the anæsthetic use of chloroform to the care and fidelity with which his experimental samples of that chemical were prepared by them. Connected with a profession requiring the closest personal attention for the faithful and successful discharge of onerous and responsible duties, Mr. Flockhart was little known in political circles, or in connection with municipal matters; but his private benevolences have been large and unobtrusive—indeed, the pecuniary and professional aid given to many deserving assistants on commencing business can never be forgotten by beneficiaries, or known to others. Mr. Flockhart was about sixty-three years of age, and has left a widow and two children to mourn his loss.—*Scotsman.*

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Poison Regulations.

Sir,—From reading Dr. Greenhow's report upon the examinations of the Pharmaceutical Society, published in your last Journal, I am led to presume that that gentleman will entertain views entirely opposed to those expressed by Messrs. Simon, Sandford and the other promoters of the "Compulsory Poison Regulations." On remarking upon the difference which exists between the grade of chemist and druggist and pharmaceutical chemist, he says, "I am of opinion further, that inasmuch as the increase of practical pharmaceutical skill is what will most conduce to the service of the public," etc. etc. Now I think he has there hit the right nail upon the head, and expresses the views of by far the larger portion of our profession.

If a man by observation, study and practice, so educates himself that he is able to pass the requisite examinations, it seems only natural that, of his own free will and in his own interests, he will use his utmost endeavours to prevent mistakes, and will have his business regulated and carried on in the best style suited to his own particular case. We must take into account the great difference there exists between each and every business; regulations suitable for a business in London would not at all do for the majority of country businesses.

I believe, as it has been frequently stated, that whatever regulations may be enforced, they will in no way diminish the number of accidents, that number being so small in comparison with the amount of business transacted. I would suggest that the agitators for compulsory poison regulations should accept the concluding passage of Dr. Greenhow's report as a sufficient guarantee, and that they should turn their attention more to the education of forthcoming chemists, to fit them for examination. I think, then, they will do far more service to their country.

B. H. Cowgill.

Burnley, August 26th, 1871.

The Pharmacy Bill.

Sir,—Like a good many others, I am thoroughly tired of the poison controversy going on in your Journal, and would not have added a single word if it had not been for the poisoning case now under investigation in Brighton.

I have no desire to reason or argue with opponents who do not wish to be convinced; I feel certain that sooner or later the Privy Council will relieve us all by passing a law compelling every chemist to adopt precautions similar to those already carried out in every well-conducted and reputed establishment. I place also very little importance in the voluminous lists of our opponents, judging from the way in which returns were obtained in this town, for I am led to believe that should the poison regulation question be once more seriously discussed, the numbers would disappear like mist, leaving a few leaders in unenviable distinctness. Anyhow, the names of those who at a moment's notice signed the petition in favour of legislative interference, when compared with those who were against it, leave not a particle of doubt in the mind of any sensible man, of what really should be done. Names like Bell, Corbyn, Dinneford, Godfrey and Cook, Hanbury, Savage, etc. etc., carry more weight than all the chemists of the back streets of London and other towns taken together.

That the principles upon which these great houses manage their business differ from those of the great number of smaller houses is nothing new or surprising; it is just this occasional difference which has brought them their present world-wide reputation, a difference which usually consisted in being a few steps in advance of others. The public, moreover, is a very good and competent judge in those matters, and requires no mouthpiece to tell them where to go for the best and most carefully-prepared medicine, and to whom to apply for poisons. The leading houses refuse to sell poisons to anybody except those who are personally well known to them; their poison register book is a great blank, while small indifferent places of business are so powerfully influenced by the fear of losing a customer as to have their sense of responsibility most wonderfully blunted. To preach to these about the uselessness of legal interference and to praise their own discretion, only leads to mischief. It would have been more salutary and wise to insist on the necessity of adopting the strictest rules and precautions in the selling and keeping of poisons, and to render such sales as rare and difficult an occurrence as possible. Every objection on that head should be met with the reply, "The greater the opposition, the clearer the necessity for lawful compulsion."

Brighton, August 28th, 1871. J. Schweitzer.

The Council of the North British Branch of the Pharmaceutical Society.

Sir,—I beg most respectfully to decline taking the advice Mr. Mackay tenders me through the columns of last Saturday's Journal. There was nothing in my last letter to convey the idea that I did not know the constitution of this Council; while the fact of my being a young member of the Society is no reason whatever that I should be ignorant of what he states. I fancy his ideas of the intelligence of his Scottish brethren in trade, myself in particular, must be of the lowest order, if he considers that we would really become members of a society, and months afterwards require to wander over the back volumes of its Journal for its history. But I shall not comment further on the manner in which Mr. Mackay has treated my communication, as any person comparing the two letters will see, at a glance, that his is not a direct reply to mine, but a mild attempt to snub what he possibly considers an aspirant to fame. I will, however, endeavour to supply a few omissions I consider he has made in his statement, in the hope that he may make use of them the next time he expounds the constitution and history of the North British Branch. They are as follows:—

Taking into consideration the facts that this very Council's report of our transactions, together with the proceedings of our annual meetings, were sent to the May numbers of the Journal and published, and that the Scotch have proverbially good memories, we did not think it at all necessary to advertise this meeting in the Journal previous to the meeting being held in April, nor for many years have we seen fit to send out circulars inviting all the members of the Society in Scotland to attend these meetings; this would have put the Society to considerable expense, not to say of extra trouble to its secretary, while we found it was quite unnecessary.

We have always held our annual meetings in the evening, as we know our friends do not object to come to Edinburgh and spend a night in the 'Douglas' for the purpose of attending them, and asserting their rights with regard to the election of the Council of the North British Branch.

I need not say we made all comers welcome who were members of the Pharmaceutical Society, and we, of course, always managed to get a few gentlemen from some of the small burghs in the immediate neighbourhood of Edinburgh to attend these meetings, whose names in the report in the Journal, with the towns they belonged to attached, looked as if we had an array of talent from all parts of the country; for we know it is a natural failing of our friends south of the border that they have but little geographical knowledge of Scotland. You will thus see that though the pharmaceutists of Glasgow, and perhaps other towns, were asleep, it was not our fault; indeed, some of us even went the length of making an occasional tour round, to endeavour to awaken them out of their state of stupor; but this had not much effect, till at length, rather than disturb our brethren in their slumbers, and not wishing to be called illiberal, we took upon ourselves the responsibility of electing to the Council Board a gentleman or two to represent Dundee and Glasgow. We did not ask these gentlemen whether they could attend our Council meetings or not; we, however, sometimes sent a notice to them, requesting them to come to the meetings of Council, but finding them always asleep, we neglected doing so when anything of importance was to be discussed, making the hurry our excuse, for we had a secret instinct telling us that if we aroused the fellows properly, it was just possible they might take Museum, Library, money grant, honour and all from us; for though I have said the clause in the Act of 1852 gives Edinburgh an examining body, the clause also says that Glasgow, or other place or places in Scotland, may be selected at the discretion of the Council in London.

I have heard it whispered that the hundred and odd pounds we get in the year from the parent Society to defray the expense of the Society in Scotland, (which is independent of the expenses connected with the examination,) has hitherto precluded some of the other provincial societies in Scotland from asking a grant from the same source; and we think it is just possible that it might be a barrier to them getting a grant were they to ask it, for the large towns in England are jealous of Scotland getting too many advantages. We are sorry, however, that we have no inclination to give up any part of the money we get, as we require it all to ourselves; and if your friends had not been asleep when the good things were being handed out at first, matters might have been different; they must now, however, accept the consequences.

Considering all this, and seeing you are such a young member of society, Mr. Fairlie, take my advice, lay your pen aside, and go to sleep with the rest of your brethren; at all events, do not disturb the "Council of the North British Branch of the Pharmaceutical Society of Great Britain."

I may just add, that I do not take up this matter from any jealousy on my part or that of any of my friends here,—the very reverse. We yet cannot see any reason to remove the examining body from Edinburgh to Glasgow, or elsewhere, as we believe thoroughly that the present Board do their duties conscientiously enough; and having hitherto received nothing but kindness at the hands of our Edinburgh brethren, we only wish that good feelings will continue to be reciprocated between us. My object, however, is to point out that Edinburgh is not North Britain, and that if the North British Branch of the Pharmaceutical Society is to be looked upon as such, it must be conducted in a more open and liberal manner. I therefore hope that the next, and all future annual meetings, of this Society shall be held at an hour in the day to suit both country and town members; and further, that sufficient notice be given, both in the Journal and otherwise, prior to the meeting taking place; and above all, that the election of the Council be conducted in a formal manner by voting papers, etc. If this is not done, our Edinburgh friends may expect that ere long "the heather will be on fire;" when they will, perhaps, regret their exclusion of other large towns in this matter.

JAMES M. FAIRLIE.

St. George's Cross, Glasgow, August 8th, 1871.

Sir,—I venture to offer a few remarks upon Mr. Mackay's reply to Mr. Fairlie on this subject, being desirous that the question of this Council's relation to the members of the Pharmaceutical Society in Scotland should be properly understood by old, new and prospective members. For though Mr. Mackay has favoured us with a *résumé* of the constitution and history of this Council, he has left the matter as to the mode in which it is elected and its powers pretty much where they were; and this I think was the point indicated in Mr. Fairlie's wish to have the question discussed. At least many of my pharmaceutical friends in different parts of the country, as well as myself, have frequently wondered what authority they had for using the title "North British Branch," seeing it was, if not wholly, at least to a very large extent, an Edinburgh institution. It is all very well for Mr. Mackay to say now, when he is brought to book, that an annual meeting was held every year, and that it has always been their regret that they could not induce more of their country friends to come forward. But how could they expect country friends to come to these meetings if they did not intimate to them beforehand that such a meeting was to take place? It is all but likely that they would ask some of their particular friends of the larger towns to come; but speaking for the country towns, I know there are gentlemen who have been five, ten and even fifteen years connected with the Society who have not received so much as one invitation to attend their annual meetings further than their annual report referred to by Mr. Mackay, which was, of course, always published a month or six weeks after the meeting had taken place, and this surely could not be looked upon as any announcement for a future meeting. As regards the Glasgow chemists being pharmaceutically asleep hitherto, I think it does not speak greatly in favour of Mr. Mackay and his Edinburgh friends that it has been so. It is only an hour or so by rail between the two places, and surely it was their duty, as leaders of the Society in Scotland, to endeavour at least to awaken them out of their languid state they had fallen into as regards things pharmaceutically. But there is too much conservatism in our Edinburgh friends to do so; in fact, to my mind, at least, they resemble in almost all things the London pharmacists. We all know how near we were having the poison regulations enforced upon us by a sidewind of the London chemists at last annual meeting, and in this case of the amended Bill and the Edinburgh Council, though Mr. Mackay says there was no intent to deceive, the fact is still there, that they call themselves the Council of the North British Branch of the Pharmaceutical Society, which, if it means anything, must mean the representative body of the pharmaceutists of Scotland, which they know it is not, though it may contain some of the oldest and best known members of the profession. With regard to the statement of Mr. Mackay, that Edinburgh is allowed by a clause in the Act of 1852 to have an examining body, I may just remind him that it is at the submission of the Scotch pharmacists that they are allowed such, and not by the Act alone; for, if the Scottish members were to demand that the examining body should sit either in Glasgow or elsewhere, the London Council would hardly refuse to give their authority for such, so that this is another instance of the overbearing manner of the Edinburgh chemists over their other brethren in trade. And I grant it is a question, now that Glasgow has awakened out of her slumber, whether she should not be considering the propriety of having this body removed somewhat nearer the west, that our young men may be saved part of the expense now incurred in passing the examinations, and also get some of the good things which it is rumoured are only to be had through such close proximity to headquarters.

M.P.S. IN THE COUNTRY.

DRUGGISTS' PRICES.

Sir,—Having been much interested in the late discussion in your pages relative to druggists' charges, believing that in such discussion or exposure of what is termed the "cutting" system, as applied to dispensing charges, will be found one potent remedy for the evil, I regret nevertheless to add a further illustration to the long catalogue already chronicled by you. I had handed to me this evening a recipe, of which the following is a copy, with the request to "see that it was properly made up," some doubts being expressed as to its being faithfully dispensed elsewhere, on a previous occasion:—

Powd. Turkey Rhubarb
Comp. Ext. Colocynth
Ext. Chamomile
Castile Soap, of each two scruples.
Mix and divide into pills.

After finishing and dividing the above into forty-two pills, I was asked what the charge would be, and on naming what I regarded as the *very* moderate sum of one shilling, you may imagine my astonishment and annoyance at being told that I was "*sixpence above* Mr. ——."

On my expressing surprise that any druggist could undertake to dispense the recipe for such a sum, I was favoured with the names of three registered chemists in the vicinity, all of whom had charged for it the paltry sum of sixpence! Had such a statement been made by a stranger I might have disputed it, but coming as it did from what I know to be a trustworthy source, I saw no reason to doubt its correctness.

The absurdity of such charges will be still further apparent if we consider that, had the sale been that of a quack medicine, containing probably *less than half* the quantity of pills above mentioned, the stereotyped 1*s.* 1½*d.* or 2*s.* 9*d.* would have been obtained without a murmur, and with no further trouble to the seller than that of handing it across the counter.

"In all labour there is profit," if we are to accept Scriptural testimony on the subject, though too many of our brethren appear to set at nought the dictum of the wise man, so far as dispensing is concerned, if we may judge from the foregoing, in addition to the many instances to the same effect, already recorded in your correspondence.

We read and hear much, at the present time, of the evils of "over-regulation prices," in relation to military matters; would that we could obtain even "regulation prices" in matters pharmaceutical!

N. O. P.

Mexborough, Yorkshire, July 24th, 1871.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. J. F. Brown, Mr. Savage, Mr. G. Brown, Mr. Eastman, Mr. J. J. Thomas, Mr. C. H. Wood, Mr. C. J. Bell, Mr. Swendon, Mr. W. W. Stoddart, Mr. J. Mackay, Messrs. Arnold and Sons, Mr. Lucas, Mr. J. David, M. M. B., B. R., J. S. H., "Ferrum," "Harry," "Dispenser," "Theta."

SEEDS IN DRUG-PARCELS:

EXPERIMENTS ON THEIR VITALITY AND CONSEQUENT USEFULNESS.

BY G. BROWNEN.

In the examination of drug-parcels for adulterations or worthless articles, an interesting and profitable field of inquiry is often overlooked. When bits of stone, earth, twine, decayed or worm-eaten drugs, etc., are removed, our duty appears done, and the parcel is either used or passed into stock.

Among the leaves, gums, barks and roots, still remain numberless seeds of various sizes, shapes and Orders—a wonder and a study in themselves, which may afford means for demonstrating many a page of Bentley's 'Botany'; or if a little trouble, care, or patience (whichever term is best) be taken with them, may be induced to germinate, and reward the effort with plants on which the botanical pharmacist will certainly look with curiosity and interest.

Last year, for the first time, this plan was adopted by me, and specimens were collected, classified as nearly as possible, and their vitality tested in the spring.

From the following parcels of drugs, a great variety of seeds and fruits were obtained, thus:—

	Varieties.		Varieties.
From Chimaphila,	2	From Senna,	7
Uva Ursi,	2	Serpentary,	4
Sumbul,	3	Buchu,	3
Anchusa,	2	Cusparia,	5
Senega,	3	Canella,	3
Ammoniacum,	4	Coca	1
Chirata,	2	Myrrh,	3
Cascarilla,	11	Matico,	3
Acacia,	10	Kino,	1
Tragacanth,	3	Calumba,	6
Cusso,	2	Cinchona,	8

Of seeds or fruits, recognized either by their structural characteristics or the plants produced from them, were the following:—

Linseed, coriander, ricinus, croton, coffee, fenugreek, areca, pomegranate, papyrus, jatropha, prunus, senna, buchu, dates, and myrobalans.

Their vitality was then tested; 103 specimens were placed on a piece of muslin, and floated on water for a few hours; many of them were thus softened or swollen in size, they were then slightly covered with mould, and forced with artificial heat. On examining the beds when the heat had declined, 27 were found to have germinated, and many were overlooked or lost.

Such a success warranted further experiments, and I planted a selection, but owing to the advanced period of the season, several sprung up and died away; others survived till the severity of last winter destroyed them, and I had only 3 or 4 left alive, and a few withered stalks of annuals for a first year's produce.

Determined to succeed, if possible, I commenced again this year, only unfortunately 1871 did not resemble 1870. Midsummer and Christmas seemed to have exchanged places, and this year's success as yet is very small.

As many of the seeds were known as medicinal articles, I determined to extend my list, and experiment on as many as I could find; of course, their numbers were greatly increased, and possibly many failed from want of proper attention, etc.; if, however, an herbarium or a structural museum be the object sought, their number may be diminished, or successful plants need not be replanted; and failures sought out and understood serve as guides to success. To study, collect, or preserve a plant when its structural peculiarities are fully developed, or in operation, will render comprehensible such terms as æstivation, etc., quicker and more correctly than months of mere book study; the definitions of *Scrophulariaceæ*, *Labiatæ*, *Atropaceæ*, and *Solanaceæ*, will lose their uncertainties, and be as easily separated in practice as in theory.

Of the official seeds and fruits, most may be induced to grow even in thickly populated towns—on housetops or window-sills—anywhere that a pot or a box of mould may stand and be watered or sunned into life. I have seen many of them growing on a flat roof in one of the most thickly populated parts of London; and one must be excessively hard worked who cannot find a few minutes, between dawn and dusk, to attend or watch the growth of such plants.

Where a greenhouse or other facilities exist—with all due respect to common garden plants—pharmaceutical plants comprise some of the most elegant; thus, stramonium, ricinus, or colocynth have elegant foliage; squills, crocus, colchicum and lobelia are good flowering plants; ginger, turmeric and cardamoms will compare favourably with the grasses; the beauty of orange, pomegranate, or capsicum fruits is not to be despised; and roses and poppies are quite beyond all question.

Many an important pharmacopœial plant, while flowering, would not be misplaced in a pharmacist's shop, it would neither indicate inattention to business, nor a want of pharmaceutical knowledge.

Official, typical, or plants having peculiar structural features need not be squeezed or pressed flat as a passover cake, in the abnormal style of the herbarium, whose decurrent, sessile and amplexicaul leaves appear most puzzlingly alike, especially to a young beginner. These plants may be dried, root and all if you like, in a mixture of 98 sand and 2 of stearine or any high-melting fat; in such a mixture, leaves, stalks and stems may be dried in their natural positions.

These dried plants, preserved from insect ravages by some insecticide, or varnished, may be planted in a pot of dry sand, and thus show their foliation, dehiscence, etc. They are as durable as skeleton plants. If they are not so beautiful as well-pressed specimens, they are more natural. Any one looking at the favourite microscopic slide, "the tongue of the blow-fly," squeezed as it is into elegance, could form little conception of that member as seen *in situ;* so, in botany, a flat specimen of *Hyoscyamus*, *Dulcamara*, or *Digitalis* resembles but faintly the mode of growth or form of those plants.

Having such an idea of an illustrative or natural botanical collection, those seed and seedlings would be carefully attended, and, when their peculiarities are developed, our necessaries would be ready to dry them.

Returning to medicinal seeds again, notice the success already obtained in scarcely two seasons.

Fifty-nine different specimens of seeds, exclusive of those already mentioned as obtained from drug-parcels, were planted, and the following have sprung up since the spring of 1870:—Dill, caraway, colchicum, colocynth, fig, henbane, mustard, white poppy, stramonium, tobacco, chamomile and cardamom.

Four other plants were obtained by the following methods:—First, liquorice, by planting a piece of the fresh root; this produced a plant three feet high last year, although it was set in a pot.

Secondly, some green ginger rhizomes were set, and twenty-three stems, ranging from nine to thirty-two inches in height, were obtained—beautiful Scitamineous specimens; these rhizomes are still alive, and shoots six inches high have sprung up out-of-doors, uncovered, notwithstanding the variations of weather and temperature.

Thirdly, two bulbs of squills were obtained and planted, and, after more than a year's inaction, one bulb has thrown down six or seven rootlets, and is beginning an upward movement; the other bulb may soon follow the example given, for it has assumed a very red and swollen condition.

Lastly, by the kindness of a friend I have a rhizome of turmeric, and it has unfolded its leaves, and is in a flourishing condition in an open window.

Ricinus is in full flower in the open garden, and several palms (*Phœnix*) are growing outside the window.

Of uncertain varieties, three shoots have appeared above ground this year in the "Ex. Acaciæ," one in "Ex. Calumbæ," two in "Ex. Cascarillæ," and five in "Ex. Sennæ" compartments. A pot containing *Jatropha* seeds was knocked over and smashed in a nightly scrimmage of cats; two of the seeds had sprouted about an inch. Whether they will recover from the shock, time will prove. A date palm, sixteen inches high, began to show signs of decay; its root had gone through the pot, and was doubled up underneath, raising the pot from the saucer in which it stood.

This is a brief description of what has been accomplished, without hothouse or stove. I have been afraid to plant all my seeds on account of the uncertainty of the weather; consequently, I have specimens or collections of many reserved.

I do not profess to have discovered a new field of research. Lobel and Don attempted to discover the source of galbanum from seed they found adhering to the gum (Royle, page 472). The tenacity of life in squill-bulbs has been noticed in a previous PHARMACEUTICAL JOURNAL; and the longevity of certain seed may be seen by referring to PHARM. JOURN. Vol. XVII. 1st series, pp. 224 and 328.

If these remarks should lead to a more extended investigation of these too often neglected botanical treasures, we may possibly add to the scanty knowledge we possess of many medical plants, and certainly obtain a cheap herbarium, or a collection of every stage of plant-growths.

SUGAR DETERMINATION IN URINE.

BY PROFESSOR SEEGEN.

The author read a paper before the Medical Society of Vienna, on "Sugar Determination," in which he first detailed the importance to the physician of proving the presence of sugar in urine, and then dwelt upon the contradictory results of existing methods of analysis, especially in regard to the presence of sugar in many physiological conditions, as, for instance, during pregnancy and during the period of suckling, after inhalation of chloroform and ether, etc. The author was thereby induced to test all existing methods, and he arrived at the following results:—

We have no reagent to prove minute traces of sugar dissolved in urine beyond doubt and to the exclusion of other analogous substances.

All statements as to the presence of minute quantities of sugar in many physiological and pathological conditions must be received with caution.

Normal urine does not contain it in sufficiently large quantities to allow of its determination.

Normal urine contains minute quantities of reducing substances, but whether they consist of sugar, partially or wholly, cannot be determined with our known tests.

Albuminous Urine and a New Reagent.—The precipitate obtained by heating urine with nitric acid is carefully washed to remove the last traces of urine, and it is then redissolved in a little potash, a few drops of Fehling's copper solution added; a fine violet coloration is instantly produced, especially with a strong solution; the reaction is very characteristic, and readily shows one per cent. of albumen.—*Zeitschrift d. allg. oest. Apoth. Verein.*

HISTORICAL OUTLINES OF PHARMACY IN SPAIN.

BY DR. T. B. ULLERSPERGER, OF MUNICH.

(*Concluded from page* 183.)

The first Pharmacopœia known in Europe was written in 1497 by Pedro Benedicto Mateo, a pharmacist in Barcelona, whose works were edited in 1521 by his son, under the title of 'De Loculentissimo viro ac Sacro Apothecario Artis divini Professoris T. B. Matei.

In 1522 F. de Sepulverda published a Pharmacopœia under the name of 'Manipulus Medicinarum, impresa en la Ciudad de Vitoria;' a second edition of which appeared at Valladolid in 1550. Before writing his books he traversed the whole of Spain, to attend the lectures of the most celebrated teachers, and then went to the University of Salamanca to profit by the instructions of the professors of pharmacy.

Between 1521 and 1527 Bernardino de Laredo, a Franciscan monk, compiled his 'Modus Faciendi cum Ordine Medicandi.' In 1535 appeared at Barcelona the 'Concordia Pharmacopolarum Barchinonensium,' augmented and revised in 1587 by Pedro Benedicto Sola, in conjunction with the pharmacist Bernardo Domonech, and with Juan Benedicto Pau.

Pedro Jaime Esteve, of Valencia, in 1552 translated from the Greek his 'Nicandri Colophonii Poetæ et Medici Theriaci.' In the following year appeared the 'Concordia Aromaticorum Cæsar-Augustæ, in quâ continentur Epithome omnium Antidotorum usualium ad unguem nuper correcta ex Fœdere eorundem Pharmacopolarum. Tractacus sinonimorum, in quo voces, quæ in hoc Volumine continentur obscuræ, exponuntur, etc., Autoribus non vulgaribus desumptus; Cæsar-Augustæ ap. Steph. de Nogera, anno 1553, quo Michael Sagaun et Bernardinus Azarues Collegio Pharmacopolarum præpositi erant."

This is one of the first Pharmacopœias embellished with poetry; the only known copy of this remarkable book was at that time already in the possession of the Pharmaceutical College at Barcelona. This rare work is divided into three parts, the last of which is entitled 'Tractatus in quo pretia Omnium

Medicamentorum Simplicium et Compositorum traduntur, quod vulgus "Tarifum" apellitat,' which is undoubtedly the oldest printed tariff or price-list.

A copy of the work dated 1651 is also in existence; at the end of it is written "expliciti sunt tractatus tres in quibus tradere epitomè o'ium antidotorum usualium et tractatus synonymorum promisimus. Cæsar-Auguste per Stephan. G. de Nogera ad laudem individuæ Trinitatis et Virginis intactæ; qui nostras agūt causas pridie Kalendas Junii anno 1553." Before the preface is written "Divisio libri," into the three parts, and then "Carmina in laudem operis et tractatus de po'deribus et mensuris, quibus pharmacopei et medici utuntur." The continuation consists of verses on simple remedies and their selection, and then four lines of original poetry; the manuscript of the copy is on ninety-two sheets demy.

In 1552 Luiz Callado published his 'Index Farmacopœarum, quæ in usu sunt apud Nostras Pharmacopœas,' and in 1586 Simon Todar's 'Nova Methodus Compositorum Medicaminum' appeared, as also in 1587 his 'Hispalensium Pharmacopoliorum Recognitionem,' at which Francisco Sanchez de Orepesa assisted him.

The first twenty years of the seventeenth century were of great importance to Spanish pharmacy, inasmuch as Philip II. issued several laws concerning the examination of pharmacists (Pragmatica, November, 1817).

These laws made it prohibitory for physicians and chirurgeons to dispense; medicines had to be made up under heavy penalties by none but pharmacists by examination. In 1650, under Philip IV., the exercise of pharmacy was declared a profession and scientific art, quite on a par with medicine. Pharmacists of that time were not permitted to carry on any business which might interfere with or distract their attention from the proper exercise of their profession. The first tariff legally enforced throughout the whole kingdom was published about this time. A record of all laws referring to pharmacy, especially those treating of the examination and of the education of pharmacists will be found in Gonzalo Samano's 'Medicina Española.'

A more complete Pharmacopœia was published in 1601 by the Colegio Farmacéutico in Valencia, under the title 'Officinam Medicamentorum et Methodum recte eadem componendi; cum variis Scholiis et Aliis quam plurimis, ipsi operi necessariis, ex sententia Pharmacopolarum Valentiorum. Valencia por Juan Crisostomo Garriz, 1601, in 2°.' A second edition was published in 1698 by the same College, and also in the same year at Zaragoza with additions, the last under the name of 'Officina Medicamentorum et Methodus recte eadem componendi, cum variis Scholiis et Aliis quam Plurimis ipsi operi necessariis; et sententia Valentinorum Pharmacopolarum, auctore eorundem Collegio, præfectis Collegii Antonio Joanne Insa et Joanne Baptista Catarroja, hinc et examinatoribus Gulielmo Salvador Borras et Francisco Joanne Molina, scriba artis Rocho Linyerola. Segundo tomo: La Farmacéutica de Francisco Velez de Arciniega. Tercer Tomo: exámen de Boticarios, por el P. Fr. Estaban de Villa. Van añadidos los Tarifas del Reino de Aragon y Ciudad de Zaragoza; y se dedica à los Sñrs. Illmos. Diputados del Reino de Aragon, Zaragoza, por Gaspar Tomás Martinez, 1693, in 2°.'

The professors of pharmacy and chemistry in conjunction with the Colegio of pharmacists at Madrid, published in 1739 the 'Pharmacopeia Matritensis Regii ac Supremi Hispaniarum Proto-Medicatus, auctoritate, jussu atque auspiciis nunc primum elaborata.' It is dedicated to Don José Cervi, whose likeness is on the frontispiece. A new edition was published in 1762.

For many years Spain had ten universities where medical pharmacy had been taught—Barcelona, Granada, Madrid, Oviedo, Salamanca, Santiago, Sevilla, Valencia, Valladolid and Zaragoza. In 1859 there were faculties of special pharmacy at Barcelona, Granada, Madrid and Santiago with 5 professors and 544 students, 390 of whom were at Madrid.

There are also twelve places, mostly universities, institutes, observatories, etc., where meteorological observations are regularly taken, viz. Alicante, Barcelona, Bilbao, Granada, Madrid, Oviedo, Salamanca, Santiago, Sevilla, Valencia, Monte de Villaviciosa de Odoro (with special school for engineers) and Zaragoza.

It was stated before that Spain was remarkably rich in mineral springs, and we need not be surprised to find the 'Anuario Estadístico' of 1860 to register 98 baths and springs. The best book on this subject is the 'Tratado Completo de las Fuentes Minerales de España,' by Pedro Maria Rubio, Madrid, 1853.

Spain undoubtedly possesses the greatest number of benevolent institutions, and among the many a special one for pharmacists was early established. In the year 1780 the Council of Castille sanctioned the erection of an institution for the support of widows and orphans of physicians and pharmacists.

It is interesting to notice that the theriac formerly was publicly prepared, and a dispute on the preparation resulted in the compilation of a remarkable work, edited by the pharmacists of Madrid and entitled 'Explicacion de las Virtudes y Método de Usar la Triaca magna Matritense, elaborada por la Descripcion de Andromaco el viejo.' Con privilegio del Rey nr. 1 en presencia del real Protomédico por el Colegio de los Boticarios de Madrid en la Oficina de los Sñras. Desclazas reales,' sine loco et anno. This singular book contains the history of the nostrum, its action and its internal and external application.

The Spanish pharmacists have among them many writers of high repute. In 1866 there existed eight pharmaceutical journals, and in October of the same year the Colegio de Farmacéuticos de Madrid met, to agree upon the rules of the Congresso Farmacéutico Español.

The practice of homœopathy is sanctioned by royal decree: the system met there, as everywhere, with great opposition, especially the equality in the faculties, but it now seems to be pretty firmly established, —chiefly, perhaps, because it formerly was in favour at the Court.

In the middle of 1869 a Junta met at Madrid to organize an Asamblea Médico-Farmacéutica. The subjects to be discussed were pharmaceutical instruction, benevolent institutions, sanitary matters on sea and land, mineral springs, forensic medicines and pharmacy and medical responsibility. In the province of Cadiz alone over 100 members joined.

In August, 1869, the Colegio de Farmacéuticos celebrated their 132nd anniversary. After the Elegio Histórico the following subjects were discussed, viz. the restoration of pharmacy, the duty to protect it against contagion of trade, to guard it against quackery, to improve the position of pharmacy and its sister, medicine, and to secure the sacred rights of humanity.

We cannot fail to observe that in Spain more than in other countries pharmacy and medicine go hand in hand, both professions taking equal rank; and this will explain that pharmacology there is not so much allied with therapeutics as with pharmacy. In conjunction with therapeutics pharmacology is only met with in French books translated into Spanish, whereas the relationship to pharmacy appears in all recent original Spanish books. We will only quote two, viz., 'Manual de Analysis Química aplicada á las Ciencias Médicas,' por Don T. R. Gomez Pamo, Dr. Pharm., a Member del Colegio de Farmacéuticos de Madrid, 1870. It contains the direct application of medicine and pharmacy, chapters on mineral springs, Spanish and foreign, on fluids of the human body, on aliments and medicaments, then practical methods for analysing industrial products most in use, and a short Tractado de Toxicologia.

The second work we select is 'Química Orgánica General y Aplicada á la Farmacia, Medicina, Industria, Agricultura y Artes, por el Dr. Don G. de la Puerta, Professor of Pharmacy at the University of Madrid, 1870.

Although the profession may not be quite so advanced as in other countries, still there is an active tendency to progress. The prescribing and dispensing are simple and rational, and no trace is left of the complicated formulas of the Galeno-Arabic time, although they obtained until the sixteenth century.—*Buchner's Repert. d. Pharm.*

INQUIRIES RELATING TO PHARMACOLOGY AND ECONOMIC BOTANY.*

BY DANIEL HANBURY, F.R.S.,

AND PROFESSOR OLIVER, F.R.S.

From the *Admiralty Manual of Scientific Inquiry.*

Asia Minor, Armenia, and Persia.

Gum Tragacanth is produced in Asia Minor by several species of *Astragalus*, which it is desirable further to identify. Travellers and others who have the opportunity should preserve specimens of any species *seen* to yield the gum, as well as specimens of the gum itself; noting at the same time whether the latter was obtained from incision in the stem, or whether exuded spontaneously. Fine gum tragacanth is produced at Caissar (or Kaisarieh) and Yalavatz, in Asia Minor, at which places the practice of making longitudinal incisions in the stem of the shrub is adopted; the gum is also collected at Isbarta, Bourda, Angora, etc.

Gum tragacanth is frequently adulterated with another gum, which has been called *False Tragacanth, Hog Gum, Bassora Gum*, or *Gum Kutera*. At Smyrna it appears to be known as *Caraman Gum*. What is its origin? One of its properties is to swell up into an opaque mass upon being placed in water, in which, however, it does not dissolve.

Storax.—None of the storax found in commerce in modern times is derived from *Styrax officinale*, L.; yet it is certain that this tree is capable, under favourable circumstances, of yielding a highly fragrant resin which was once much valued. Authentic specimens of this resin, which is the original and legitimate *storax*, are much desired. It was formerly produced in the south of Asia Minor, where the tree is still found in abundance.

Salep.—Obtain specimens of the different plants which yield salep in Asia Minor and Persia, and especially of those that afford the best kinds.

Larch Agaric (*Polyporus officinalis*, Fries).—This fungus now comes from Northern Russia, where it grows on the stems of *Larix sibirica*, Ledeb. During the middle ages it was exported from Asia Minor; and in the Paris Exhibition specimens from this region, that is to say, from the Gulf of Adalia, were exhibited. What is the tree from which this Asiatic Agaric is obtained?

Assafœtida.—Although the ordinary assafœtida of commerce is doubtless the produce of *Narthax Assafœtida*, Falc., there are some varieties of the drug which, it is reasonable to conclude, are derived from other species. One of those sent from India to the Great Exhibition of 1851 was a brown pellucid gum-resin, containing pieces of the stalk of the plant, and differing considerably from ordinary assafœtida.

Sagapenum, a gum-resin resembling assafœtida, but not acquiring a pink colour upon exposure to the air, and of not so strong an alliaceous odour. As it is occasionally shipped from Bombay, it is presumed that it is produced in Persia. Though it has been used in medicine for ages, its botanical origin is not ascertained; from analogy, however, we may infer that it is the produce of some large plant of the Natural Order *Umbelliferæ*. Compared with assafœtida and galbanum, sagapenum is a rare and costly drug.

Galbanum.—The remarks we have made upon sagapenum apply, to a great extent, to the gum-resin known as *Galbanum*. Galbanum is, however, a far more abundant substance than sagapenum. It occurs in trade in two varieties, which are so distinct as to lead to the inference that they are yielded by distinct plants. Galbanum is said to be imported into Russia in large quantities by way of Astrachan, but that which reaches England comes principally from Bombay.

Opopanax, another fœtid gum-resin, the produce, according to most authorities, of *Opopanax Chironium*, Koch, a large umbelliferous plant, native of the south of Europe, and of Asia Minor. There is no modern account of the collection of this drug, nor is its place of production ascertained.

Africa—West Coast.

Copal.—Sierra Leone copal is produced by *Guibourtia copallifera*, Bennett, *Kobo* of the natives: of this tree, which is not well known, specimens, including the ripe pods, are requested; it grows at Goderich and in other localities near Sierra Leone.

Grains of Paradise.—Although *Amomum Melegueta*, Roscoe, the plant which yields this drug, is now well known, there are some interesting species nearly allied, with which botanists are very imperfectly acquainted. It is, therefore, desirable to procure specimens of such plants from various parts of the West Coast of Africa. These specimens should comprise the flowers and fruits, as well as the foliage. As the flowers are very delicate, it is necessary to preserve them in spirit of wine. Some specimens of the fruits should also be preserved in the same manner. As the species often grow intermixed, and as flowers and fruits are produced at different seasons, special care is requisite to avoid confusion.

African Turmeric is said to be the rhizome of *Canna speciosa*, Rosc., but further investigation is desirable. Living roots might easily be procured at Sierra Leone, and sent to England for cultivation.

African Mammee (*Ochrocarpus africanus*, Oliv.), native of Sierra Leone and Prince's Island. Specimens of the tree, and (in alcohol) of the fruits, which are as large as an orange, are requested.

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* Information relating to any of the subjects here referred to may be addressed to Mr. Hanbury, Clapham Common, near London, or to Professor Oliver, Royal Gardens, Kew.

BITTER KOLA of Fernando Po.—The common *Bitter Kola* (*Cola Nuts*), largely used by the natives of West Tropical Africa, is known to be the produce of a wide-spread tree, *Cola acuminata*, Br., but the origin of the *Bitter Kola* of Fernando Po is still uncertain. There can be no doubt that it is the seed of a Guttifer (*Garcinia* or *Xanthochymus*), so it must be sought on a tree with strictly opposite leaves; the seeds probably contained in a pulpy fruit.

BALSAM OF ST. THOMAS is the name of a tree growing in the island of St. Thomas, in the Gulf of Guinea. Specimens in flower and fruit, also of the resin, if it afford such, with information as to the mode of procuring it, would be acceptable. It is probably a species of *Sorindeia*.

BITTER WOOD. A species of *Quassia* (*Q. africana*, Baill.) is found in the Gaboon and Camaroons rivers. Specimens of the wood are required to show whether it may serve as a substitute for the Tropical American species (*Q. amara*).

What is the Kpokpoka tree of West Tropical Africa, from the fibre of which the "dodo" cloth is prepared? Specimens in flower are wanted.

Specimens in flower or fruit of any shrubs or trees of Upper Guinea, affording elastic gums, *india-rubber* or *gutta-percha*, with accompanying gum and mode of its collection, are particularly requested.

AFRICA—EAST COAST, INCLUDING THE RED SEA, ARABIA AND MADAGASCAR.

MYRRH.—This celebrated drug is collected in great quantities by the Somali tribes on the African coast, near the southern extremity of the Red Sea, whence it is brought to Aden for shipment to Bombay. A variety of myrrh, which is probably yielded by another species, is also produced (according to Vaughan) in a district lying forty miles to the east of Aden, to which place it is brought for sale. A third variety, distinguished by the Arabs as *Bissa Bôl*, is also collected by the Somali tribes, and sent by way of Aden to India. It is a point of much interest to determine with accuracy the plants which afford these several sorts of myrrh, and for this end it is earnestly requested that those who have any opportunity for investigating the subject will not neglect to do so.

OLIBANUM.—The Olibanum found in European commerce is produced partly on the African coast, near Cape Gardafui, and partly on the southern coast of Arabia, whence it is shipped to Bombay. There is still some doubt about the various species of *Boswellia* which yield the drug, and additional specimens, including flowers and mature fruits, are desired.

KORARIMA CARDAMOM is the name under which the late Dr. Pereira has described an Abyssinian cardamom, having the shape and size of a small fig, which is exported from Mussowah, a port at the southern end of the Red Sea. This drug, which has long been known in medicine, is perforated at the smaller end, and, when strung upon a cord, is commonly used by the Arabs and Abyssinians as beads for their *mesbehas* or rosaries. It is said to be brought to the market of Baso, in Southern Abyssinia, from Tumhé, a country situated in about 9° N. lat. and 35° E. long. The plant, for which the name *Amomum Korarima* has been proposed, is entirely unknown.

DRAGON'S BLOOD, of the Island of Socotra—By what plant is it afforded?

CATHA EDULIS, called in Arabic *Kât*. A large supply of the dried leaves of this shrub, say one hundred pounds, should be procured for chemical examination. The plant grows in Southern Arabia and in Abyssinia.

KAMALA.—A peculiar sort of Kamala, evidently not derived from *Rottlera tinctoria*, Roxb., has been imported from Aden. Nothing is known of its place of growth or of the plant by which it is afforded. (PHARM. JOURN. IX. (1868), p. 179.)

KOUSSO.—Fresh seeds of the Kousso tree, *Brayera anthelmintica*, Kunth, should be procured for cultivation.

GUM ARABIC.—*Acacia Verek*, Guill. et Perrott., a tree growing all over the northern part of Central Africa from Senegambia to Abyssinia, is said to produce the best sort of gum arabic. Fragments of the stem, with the gum exuding, from Western as well as from Eastern Africa, are requested, in order to ascertain the identity or diversity of the gum produced by one and the same plant in different localities.

CALUMBA ROOT.—Whether this drug is furnished wholly by *Jateorhiza Columba*, Miers, or in part by *J. Miersii*, Oliv., both of them plants of Mozambique (but the latter found also in Madagascar), is not known. Travellers visiting the localities where the drug is collected should obtain good specimens of the plant, as well as living roots, which are fleshy and easily transported without earth.

TANGHIN of Madagascar (*Tanghinia venenifera*, Poir.).—A specimen is requested of the poisonous milky juice. A portion should be partially dried with a gentle heat; another portion should be mixed with spirit of wine and sent in a fluid state.

CAOUTCHOUC, or INDIARUBBER.—In Madagascar, as well as in Mozambique, there are several trees said to yield this substance. Good specimens and definite information should be collected.

INDIA, SIAM, AND THE INDIAN ARCHIPELAGO.

CATECHU.—Observe the processes by which the various kinds of *Catechu*, *Cutch*, *Terra Japonica*, and *Gambir* are obtained; and, if from trees, whether from others besides *Acacia Catechu*, *Areca Catechu* and *Uncaria Gambir*. We wish to identify the trees with the respective extracts.

What is the source of Pegu Cutch, especially?

BENZOIN, OR GUM BENJAMIN.—It would be interesting to obtain good specimens of the tree which affords this drug in Siam in order to compare them with *Styrax Benzoin*, Dryand., which produces the Benzoin of Sumatra.

CAMPHOR OF BLUMEA GRANDIS, D.C.—Some pounds of it are desirable, in order that its nature may be investigated. (See 'Pharmacopœia of India,' p. 123.)

MISHMI BITTER, or MISHMI TITA.—The small yellow rhizome of *Coptis Teta*, Wall., a drug known in medicine since a remote period, is produced in the Mishmi mountains to the east of Assam, and probably also somewhere on the confines of China further north. The plant which yields it is very little known, and complete specimens are desirable. It is possible that some second species may furnish a portion of the drug.

ACONITE ROOT has been imported in considerable quantities from India. In what district is it collected, and from what species of *Aconitum*?

AROMATIC BARKS, known as CULITLAWANG, MASOY, and SINTOC, derived from trees of the Order *Laurineæ*, are objects of considerable trade in the Indian Archipelago. The traveller should embrace the opportunity, when it occurs, of seeing the bark collected, and of obtaining authentic specimens of it, and of the tree yielding it. Masoy bark is produced on the west coast of New Guinea.

(*To be continued.*)

THE HONEY TRADE.

BY P. L. SIMMONDS.

(*Concluded from page* 184.)

The ceremonies of the Greek church requiring a large consumption of wax candles, greatly favours this branch of rural economy in Russia, and preserves it from the decline to which it is exposed in other countries, from the increasing use of stearine, oil, gas, and other fluids.

for illuminating purposes. The peasants produce wax so cheaply that, notwithstanding the consumption of this article has greatly diminished abroad, it still continues to form an important item of the commerce of the country; but the exportation of honey has considerably increased in consequence of the extended use of potato-syrup, which has also injured the honey trade in the interior. The rearing of bees is now almost exclusively dependent on the manufacture of candles for religious ceremonies, and on the consumption of honey during Lent, it being then used instead of sugar by the strict observers of the fasts.

The Government encourages this branch of rural industry, as affording to the peasant an extra source of income, and has adopted various measures for the accomplishment of this end. With the view of diffusing the requisite knowledge among the people of the public domains, bee-hives, and a course of practical instruction upon the subject of bee culture, have been established at several of the Crown farms, and pupils are sent every year, at the expense of the government, to the special school in Tschernigow, founded for the purpose in 1828. After having finished their studies, the pupils quitting this establishment may become teachers in the schools dependent on the Ministry of Domains, or carry on the business of teaching on their own account. They enjoy a temporary exemption from military service, and such of them as wish to establish hives for themselves obtain loans for the purpose from the Department of Rural Economy. By way of further encouragement, the Ministry of Domains has granted permission to the peasants to establish hives in the Crown forests, under the precautions necessary to prevent the occurrence of conflagrations.

The total production of wax in Russia was estimated, ten or twelve years ago, at 5,412,000 pounds per annum; and, as the usual calculation is three pounds of honey to one of wax, this supposes a production of 16,236,000 pounds of honey, the whole being valued at £450,000. The Cossacks keep large stocks of bees; the number of apiaries is upwards of 1500, containing more than 31,000 hives, and producing annually about 300,000 pounds weight of honey and wax.

A large quantity of honey is obtained in various provinces of Italy, such as Valtelina, Lombardy and Volterra, in Tuscany, in Sicily and in Sardinia, where it has an exquisite flavour, for which it enjoys a high reputation. This production amounts to about 3,750,000 pounds. The bitter honey is a peculiar kind, which is found in Sardinia. It has no unpleasant property. It appears to derive its character from the heaths, which in certain localities seem to support exclusively the bees.

The sweet and aromatic nature of the plants of Greece gives to the honey produced there peculiar qualities, which have been celebrated by her poets. The honey of Hymettus has always been the most distinguished, according to the testimony of Theophrastus and Dioscorides, who say "The best honey is that of Attica, and of that the most excellent is from Hymettus, and the honey of Xanysto, which is called rose honey; the latter kind is produced only at Xanysto, and it takes its odour from the wild rose, which furnishes the food of the bees." But this sort of honey is not produced every year, as it is influenced by the growth of the wild rose, and is hence called rhodomele. Honey is gathered at two different seasons, viz. May and June, and August; the first produced is the best. Some years ago the annual quantity exported from the ports of the Piræus, Gythion, Calamas, and Chalcidia, exceeded 300,000 pounds weight. In the five years ending 1864 the average quantity of honey produced in the island of Porto Rico was 4,000,000 gallons a year.

The honey of Spain is abundant and of excellent quality. The variety of aromatic plants of the family of *Labiaceæ* (thyme) furnishes abundant food to the bees. The honey called azalar, because it is furnished by the bees who take the pollen and the sweet sap of the nectars of the orange blossoms, is renowned in Seville and Cordova. The price of the honey of the latter locality is, however, more than double that of the former. The honey of Huelva, obtained in the village of Hinoiosa, is the principal product of the district.

About ten years ago an extensive traffic was carried on in the transit of quantities of hives of bees from the Atlantic to the Pacific States of America. Many hundreds of hives were brought down by the Hudson River railroad to New York, and shipped there by steamer and rail to Panama, and then sent on to California, where they were sold to great pecuniary advantage within a few days. For some reason, apparently not very well understood, the bees do not thrive in California without artificial aid, although the country seems to afford abundant means of sustenance. One lot of hives which cost 14 dollars each were sold for 75 dollars each hive. Another venture resulted still more successfully. The bees were transported in the hives they had filled. One side of each hive had a wire gauze, which admitted air freely; and, on board the cars and steamers, they were stored so as to secure good ventilation. This trade was carried on for several years. Some information concerning the honey trade in the United States has recently been printed in this Journal.*

It has been estimated that the pasture of Scotland could maintain as many bees as would, on an average, produce 80,000,000 quarts of honey, and 1,000,000 pounds of wax. Were this quantity tripled for England and Ireland, the produce of the kingdom would be 240,000,000 quarts of honey, and 3,000,000 pounds of wax annually. The income that would thus arise from honey, at the very moderate price of 2*s*. 6*d*. per quart, would amount to £3,000,000 sterling, and the wax, at 1*s*. 6*d*. per pound, would produce £225,000 sterling.

Endeavours should always be made to have beds of the earliest spring flowers cared for by bees near the hives. Winter aconite (*Eranthis hyemalis*) is their earliest friend, and, growing only about four inches high, does well below and about the hives. Then comes their dearly loved crocus, single *Hepatica*, coltsfoot (*Tussilago Petasites*), the invaluable palm-willow, and then turnip and cabbage flowers. Buckwheat is advised by some bee authors; but I have not found they cared much for it. Mignonette should be grown largely for them, but their chief food in summer consists of white clover and common heather or "ling" (*Calluna vulgaris*); and in most places in Scotland one or both these flowers are so plentiful till the middle of September, that garden flowers, except in early spring, are of little importance. Those who will calculate the time lost by a bee flying many times a day, sometimes miles, to a heather moor and back again to its hive with his drop of honey, and will multiply that time by the crowd of workers sent out daily, will easily understand the immense importance of having their hives shifted to a heather moor in August, if at all possible—the great bulk of honey made in Scotland being derived from heather. This is so well understood in some parts, that I have seen several hundred hives sent in August to shepherds' houses in a moor, nearly all of which had come from the low country, many from twenty miles' distance. I have known such hives going to the moor nine pounds weight, and returning, five weeks afterwards, weighing sixty pounds; and unless the season is very wet, all do well when planted among the heather bloom. In fact, one bee thus situated does as much work as a dozen who have to fly many miles for their drop of honey. In Belgium I have seen spring-carts fitted nicely with shelves for hives, and crowded with them on their way to the heather moors of the Ardennes.—*Journal of Applied Science.*

* See Pharm. Journ. 3rd series, Vol. I. p. 806.

The Pharmaceutical Journal.

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CHEMISTS AND THE USE OF STILLS.

THERE seems yet to be considerable misapprehension as to the use of stills by chemists, and among other illustrations of the fact we have received the following letter on the subject:—

"Your correspondent 'Aqua Destillata' seems ignorant of the fact that for the use of a one-gallon still no licence or permit is necessary. He can use anything under two gallons without the interference of the Excise. If he wishes to use a larger one, he ought to pay the same licence as myself and others, or the Excise Commissioners would be acting unfairly towards us."

This is wrong. A chemist cannot use a still of less content than two gallons without a licence or special indulgence from the Board of Inland Revenue, any more than he can use one of larger capacity. It is true that immediately after the Act 9 & 10 Vic. c. 90 was passed, the Inland Revenue authorities allowed a *retort* of less content than two gallons to be used without licence, although the Act in question specifies that "any still or retort" is to be paid for. This indulgence was evidently granted for the reason that *retorts* are constantly used by chemists in their general business, and also that *retorts* cannot economically be employed for purifying or concentrating alcohol. However, since this permission to use *retorts* was given twenty-five years ago, and since the Board of Inland Revenue has power to withhold the indulgence at any time, it would perhaps be wise for those desirous of using, in their business, *retorts*—especially of large capacity—to ask the Board's permission before doing so.

The clause giving the Board of Inland Revenue the power to grant exemption from the payment of this duty is as follows:—

"Provided always that the Commissioners of Excise may permit the keeping and using of any still or stills for experiments in chemistry, under such regulations as they think fit; provided also, that the Commissioners of Excise may permit the keeping and using of any still or stills by persons carrying on trade or otherwise, for the manufacture of any articles other than spirits or spirit mixtures, upon every person who has a still giving notice thereof to the nearest officer of excise, and conforming to such regulations as the Commissioners of Excise think fit to direct before beginning to use any still as last aforesaid."

It is worthy of remark in regard to this matter, that in this clause reference is only made to stills, and although the Act specifically states that the "sum of ten shillings shall be yearly paid by every person keeping or using any still or retort, so long as any still or retort is kept or used as aforesaid," retorts are not mentioned at all.

THE SALE OF BENZINE COLLAS, ETC.

WE congratulate our readers that the Act for the safe keeping of petroleum and other substances of a like nature, passed at the end of the late session of Parliament, provides for the sale of benzine collas and similar articles without a petroleum licence. This matter has been the source of much annoyance, and has given great trouble to have it put on a satisfactory footing. According to section 7, the provisions of the Act respecting the regulations as to storage of petroleum shall not apply to petroleum kept either for private use or for sale, provided the following conditions are complied with:—

"(1.) That it is kept in separate glass, earthenware, or metal vessels, each of which contains not more than a pint, and is securely stopped.

"(2.) That the aggregate amount kept, supposing the whole contents of the vessels to be in bulk, does not exceed three gallons."

This question is therefore at length definitely settled, and druggists need not be under any further apprehension of annoyance on account of the sale of benzine collas or similar preparations.

THE EVENING MEETINGS.

THE first evening meeting of the session, to be held on Wednesday, October 4th, will, as usual, be devoted to the presentation of the prizes awarded to the successful students during the past session. The address to the students will be delivered by Mr. JOHN MACKAY, of Edinburgh. The Council, mindful of the additional interest given in past years to these special occasions by the presence of the ladies, have again extended their invitation to them.

As will be seen by reference to the official notices, the Council will be glad to receive for exhibition during that evening and the following day any articles of novelty or otherwise specially interesting to pharmacists.

THE BENEVOLENT FUND.

As there are but two candidates for the forthcoming election of annuitants on the Benevolent Fund, there will be no competition this year. We are requested to mention this in order to explain the non-issue of the usual voting-papers.

CHINESE AND INDIAN OPIUM.

The report from her Majesty's Consul at Shanghae, just published, states that the importation of Indian opium into China has been seriously affected by the competition it has met with from the native drug. Although the consumption of opium in China increases, year by year, the import of the foreign drug during the past four years has decreased, or, at the most, has remained stationary. A considerable quantity of the native drug from the provinces of Szechuen, Kweichow, and Yunan, now finds its way to Shanghae, where it is remuneratively disposed of at about half the price of the Malwa opium.

As an illustration of the extent to which the market is influenced by the rapidly increasing growth of the native poppy, it may be mentioned that in 1869, a report having become current that the Chinese Government had determined to put a stop to the growth of the poppy in its dominions, a brisk demand for Indian opium sprang up in consequence, which led to a rise of twenty per cent. in the price. When, however, it became evident that the Government had no real intention of carrying out such a project the price again receded.

Persian opium is reported to be coming into greater favour with the natives, especially in the northern provinces, where it is sold at a price considerably below that of Malwa.

ADULTERATION OF TEA.

Of all the articles of domestic use which in their turn are reported to undergo the process of adulteration, there is perhaps not one that bears a worse reputation than tea. Only a short time since a question was asked in the House of Commons in reference to a quantity of tea that had arrived in the docks, in which it was said that large quantities of iron-filings were present. Since then other adulterations have been reported as being practised by the Chinese, some of which are positively loathsome, and it is almost a relief to hear of one in which at least the repulsive features are absent.

Colonel Medhurst, her Majesty's Consul at Shanghae, reports an innovation in the art of adulteration, by means of willow leaves, which has recently sprung up, and threatens to grow into a trade that will seriously affect the quality of all classes of green tea sent from that port. He gives the following particulars concerning this fresh addition to our list of adulterants:—

"The preparation of the willow leaf for mixture with tea is openly practised in the villages of the Hong-keu side of the Soo-chow Creek, and it has become an industry which claims an important share of the attention of the villages of that and other localities. The banks of the numerous creeks are planted with willow-trees, the young leaves of which are collected in April and May, very much in the way that the tea leaf is gathered. The produce is then collected in heaps on the hard threshing-floors of the hamlets, and is allowed to undergo a mild fermentation in the sun. The leaves are then manipulated similarly to those of the ordinary tea-plant. They are sorted into kinds according to sizes, and afterwards roasted in common tea ovens. The appearance of the stuff after this treatment is not unlike that of the genuine article, and it is carried to Shanghae and there intermixed with pure tea, at a ratio of from 10 to 20 per cent.

"The cultivation and preparation of willow leaves were begun in Shanghae about ten years ago, and have increased year by year. The poorer classes near Shanghae have for a long period consumed this leaf as an infusion in place of tea, the latter being too expensive for them to purchase. As far as I can gather, its use is productive of no ill effect, but its flavour has not the slightest resemblance to any known tea. The cost of the article cannot exceed 2*d.* per pound, but when mixed with tea and so sold to foreigners, it must represent a very large profit to the producers.

"The interference of the authorities with regard to this spurious manufacture may shortly be necessary for the purpose, if not of its actual prohibition, which may not be possible, at all events of placing it under such control as that foreigners may be in a position to satisfy themselves as to the quantity produced, and the proportions used in mixing; so that the adulterated article may take its proper position in the tea market.

"From inquiries instituted through the superintendent of police, it transpires that there are at this moment about 400 piculs, say 53,000 lbs. of this willow leaf in the course of preparation at various drying-houses in the foreign settlements at Shanghae. The probable amount made up last season is estimated at not less than 3000 piculs or 400,000 lbs. I am not aware that any analysis of the properties of the willow leaf has as yet been made at Shanghae; but attention to the above facts will doubtless bring about an investigation of the kind, which is certainly demanded in the general interest, by the rapid expansion which is exhibiting itself in this feature of the tea trade."

MEETINGS OF GERMAN AND AUSTRIAN SOCIETIES.

The season of the various annual meetings of scientific societies on the Continent has commenced, as the following list, taken from the Zeitschrift der allg. oest. Apothekerverein, will show, viz.:—

Naturforscher Versammlung. The forty-fourth meeting of German natural philosophers and physicians at Rostock, Mecklenburg, from 18th to 24th inst.

Norddeutscher Apothekerverein, North German Pharmaceutical Union, Sept. 14 to 16, at Dresden.

Fifth general meeting of the Union Æsculapius of surgeons at Salzburg, took place Aug. 28 to 30.

Fifteenth meeting of Hungarian physicians and natural philosophers took place at Arad, from August 28th to September 2nd.

Tenth general meeting of the Austrian Pharmaceutical Society was held at Linz, Sept. 3 to 5.

Borax is said to occur in a crystallized state in a lake in Lake county, California. Until the winter of 1869 this lake was so shallow that the proprietors were able to obtain the borax cheaply by dredging. But the unusual quantity of rain that fell during that season increased the depth to eighteen feet, and the work was consequently suspended. This deposit of borax is supposed to be the largest in the world.

Transactions of the Pharmaceutical Society.

MEETING OF COUNCIL.

September 6th, 1871.

MR. A. F. HASELDEN, F.L.S., PRESIDENT, IN THE CHAIR.

MR. EDWARDS, VICE-PRESIDENT.

Present—Messrs. Atherton, Betty, Bottle, Carr, Greenish, Groves, Hills, Savage, Stoddart, Sutton, and Williams.

The minutes of the last meeting were read and confirmed.

A letter from Mr. Deane was read in reference to the condition of the Museum, Library, and Specimens for the use of the Board of Examiners in Scotland.

The Council had an interview with Mr. Deane, and after some discussion, he having retired, it was

Moved by Mr. Greenish, seconded by Mr. Bottle:

Resolved—That Mr. Deane's letter be entered on the minutes, and that the following constitute a special Committee to report to the Council thereon:—

Committee: — The President, the Vice-President, Messrs. Betty, Frazer, Mackay, Sandford, Shaw, Sutton, and Williams.

The Report of the Finance Committee was presented, showing on the General Fund Account a balance in the Treasurer's hands of . . . . £1178. 8*s*. 8*d*.

And submitting for payment accounts amounting to . . . . £506. 16*s*. 11*d*.

On the Benevolent Fund Account subscriptions received during the month of August amounted to £14. 5*s*. 0*d*., making the balance in the Treasurer's hands of . . . . £245. 11*s*. 1*d*.

Resolved—That the Report be received and adopted, and payments made.

The Report of the Provincial Education Committee having been read, it was

Resolved that it be received.

The Report and recommendations of the Parliamentary Committee having been read, it was

Resolved—That they be received and adopted.

Resolved—That the Registrar be authorized, and is hereby instructed, to erase from the register the names of Thomas Letch, Edward Mickle, and William Laws.

Resolved—That John Jackson, of Wetherby, being duly registered as a Pharmaceutical Chemist, be elected a Member.

Resolved—That Richard Wood, of Macclesfield, a registered Chemist and Druggist, be elected a Member.

Resolved—That a Member having paid his arrears of subscription and a fine, be restored to his original status in the Society.

Resolved—That Henry J. Mornement, Associate of the Society before July, 1842, be elected a Member.

Moved by Mr. Williams, seconded by Mr. Betty,

That the following registered Chemists and Druggists be elected Members of the Society:—

Edward Gould .... Bromley.
John Middleton Wyborn ...... Bromley.

Mr. Groves called attention to the fact that these names had been submitted to the Council for election on a previous occasion, and stated that he still objected to their election on the ground that they were homœopathic chemists.

Mr. Williams said that Mr. Gould had spoken to him on the subject, and he certainly did not think they were acting fairly in not electing him. He was a man of standing, and he did not think they ought to draw a line and say they would not admit homœopathic chemists. Many of their members sold homœopathic medicines; and as Mr. Gould said, it was a most absurd thing that he should not be a member of the Society when some of his assistants were pharmaceutical chemists or chemists and druggists. Mr. Gould was properly registered under the Act, and claimed, as he thought rightly, to be elected a member of the Society. He brought it forward as a matter of principle.

Mr. Groves said that equally as a matter of principle he should vote against the motion.

Mr. Carr said he should do the same.

Mr. Edwards asked if there were any homœopathic chemists members of the Society.

The Secretary said he believed not.

Mr. Groves said the Society was one of Pharmaceutical Chemists; these men did not use the same Pharmacopœia, or the same drugs, nor had they anything to do with the Society. They might as well admit hydropathists.

Mr. Williams thought that under the Act of Parliament they were almost bound to elect any one properly placed on the register.

Mr. Atherton said they were not bound to admit anybody.

Mr. Edwards said the Act made a great distinction between matters for the public benefit and matters affecting their own internal arrangements as a Society. If a man passed a certain examination he was entitled to call himself a pharmaceutical chemist, and have all rights accruing to him as such, but making him a member of the Society was optional.

Mr. Bottle read clause 18 of the Act 1868,—"Every person who at the time of the passing of this Act is or has been in business on his own account as a chemist and druggist as aforesaid, and who shall be registered as a chemist and druggist, shall be *eligible* to be elected and continue a member of the Pharmaceutical Society according to the Bye-laws thereof."

Mr. Betty seconded the motion. He thought, under the words of the eighteenth clause, they were morally bound to elect any properly qualified person, because he recollected there was a long discussion on the meaning of the word "eligible" prior to the passing of the Act, and Mr. Sandford, the then President, stated that that word meant that there was a moral right in the persons referred to to be elected. Indeed, after communication with Mr. Flux upon the subject, he believed Mr. Sandford went so far as to say that with that word in the Act of Parliament there was a legal right, and he stated distinctly that he should have no objection to substitute the words "shall have a right." Again, they called themselves the Pharmaceutical Society, and according to etymology that included all who ministered to the public wants with regard to curing diseases. They had nothing to do with the manner in which those diseases were cured; homœopathic chemists dispensed the prescriptions of duly qualified medical practitioners, and he did not see how they could properly be excluded. If they cured diseases by a method which the old school did not think the best, that had nothing to do with the Pharmaceutical Society. He thought, therefore, they were morally bound to elect these gentlemen; and if there was no legal right, they should certainly act in a liberal rather than in a narrow spirit. At any rate he should like to hear some reason given for refusing to elect them.

Mr. Hills said his reason for voting against the election was that he did not think these gentlemen would do the Society any good, or that they would get any good from it. It might cause contention in the educational department, for they might wish to introduce lectures on homœopathic pharmacy.

Mr. Stoddart thought there would never be many of these men applying for membership, and they would not dream of instituting homœopathic lectures.

Mr. Hills said if he were a homœopathic chemist and a member, he should certainly bring it forward and try to introduce it.

Mr. Williams said that generally speaking homœopathic chemists were very well educated scientifically; indeed, rather above the average of chemists and druggists.

Mr. Sutton said his experience was quite the contrary.

Mr. Groves said if the Council acknowledged the status of these men, he did not see how they could draw the line and refuse to put on the register booksellers and others who had sold homœopathic medicines prior to the passing of the Pharmacy Act.

Mr. Williams said that was a distinct point. There was no question about the propriety of these men being on the register.

The motion was then put, and the following division took place:—

For—Messrs. Betty, Bottle, Savage, Stoddart and Williams (5).

Against—Messrs. Atherton, Carr, Greenish, Groves, Hills and Sutton (6).

The motion was therefore lost.

Messrs. Edwards and Haselden were present at the division, but did not vote.

Resolved—That the following having passed their respective examinations, be elected Associates in business:—

MINOR.

Hairsine, Herbert S. ....London.

MODIFIED.

Burkinshaw, William Thomas ..Belper.
Corrie, Andrew A. ....Bedford.

Resolved—That the following, having passed their respective examinations, be elected Associates of the Society:—

MINOR.

Webster, John ....Market Deeping.

MODIFIED.

Dickinson, William ....Manchester.
Hitchin, Robert ....Bradford.
Ray, William Herbert..........Barnet.
Sloman, Richard ....Norwood.
Stewart, William Henry........Paris.

Messrs. Benjamin Heald, of Sleaford, and J. S. Eyre, of Launceston, were appointed Local Secretaries to the Society.

Moved by Mr. Carr, seconded by Mr. Edwards:

Resolved—That as there are only two candidates for election on the Benevolent Fund in October next, no voting-papers be issued on this occasion.

A letter from Mr. Fletcher, one of the late candidates for the Jacob Bell Scholarships, was read, suggesting a revision of the rules relating to the competition for these Scholarships. Letter referred to the Library Museum and Laboratory Committee to consider and report thereon.

At the request of the Council, the President undertook to place a notice in the Journal intimating that novelties interesting to pharmaceutists would be exhibited at the ensuing evening meeting in October, and that persons desiring to exhibit should communicate with the Secretary.

Proceedings of Scientific Societies.

BRITISH PHARMACEUTICAL CONFERENCE.

Tuesday Afternoon, August 1.

Mr. H. Smith then read a paper by Messrs. T. and H. Smith, entitled "Notes on Aloes, with reference chiefly to the Cathartic qualities of Aloin."

The Chairman said that the two papers just read were very valuable, and he hoped they would elicit remarks from those specially acquainted with the use of aloes. As to the crystals, it seemed strange that from different kinds of aloes different crystals should be formed. He would like to know from Mr. Smith if there was any difference in the actual measurements. The shapes were different; although sometimes it appeared to the inexperienced eye a mass of crystals, there were two predominating angles. He believed it was possible to measure the crystals to a great nicety; and he would suggest to Messrs. Smith that they should kindly have the angles of the crystals measured, and tell whether there was much difference between the aloin from the different kinds of aloes. They did not use aloin in the West of England to the extent that it was used in Edinburgh and the North. He had no doubt of the activity of the aloin as a purgative, but he would like to know if observations had been made as to the relative use of it. In the West of England they were gradually going round to the idea that the Barbadoes aloes were the best to use. When he heard Mr. Smith say that there was more aloin to be obtained from the Barbadoes aloes than the others, he thought that was a further proof in support of Mr. Smith's assertion that it was a purgative. As to the application of aloin to horses, what Mr. Smith said as to a horse being sick and refusing its food, was the very thing they wished to avoid.

Mr. A. W. P. Smith said that aloin had no pretensions to anything superior to aloes other than activity. The great advantage of aloin over aloes was its reliable character, and that it was always to be trusted. The variable character of the crude drug was a great drawback.

Mr. T. Smith replied to some statements on the subject which appeared in the *Journal de Pharmacie*, and maintained that aloin was of great value.

Mr. Williams said it was very important they should know that different kinds of aloes yielded different kinds of crystals. He would like to know more about the different crystals produced, from the various aloes of commerce. He had no doubt that the Messrs. Smith could furnish the information. He himself had manufactured aloin, and he had found great difference in the yield; but the best yield was from the Barbadoes.

Professor Attfield made some confirmatory remarks as to the way in which the apparently contradictory statements as to the activity of aloes and aloin might possibly be found to harmonize. Bodies alike in appearance, coming from the same source and closely allied in chemical composition, were known to possess very different physiological properties. Thus Matthiessen and Wright's apomorphia had medicinal characters entirely different from those of morphia, but varied in chemical composition only to the extent of the elements of one molecule of water. Again, there were strong grounds for believing that codeia was a similar structure to morphia, except that one of the hydrogen corner-stones, so to speak, had been taken out and a methyl stone put in its place. Nay, similar modifications produced non-poisonous from poisonous compounds. Thus kakodylic acid, which contained as much arsenicum as was present in arsenic acid, had no effect on rabbits, and probably none on man. Hence he would not be surprised to find that different, or even similar, kinds of aloes contained different modifications of aloin varying in medicinal activity. This hypothesis might turn out to be valueless, but with such workers as Dr. Flückiger, the Messrs. Smith and Dr. Tilden, and the discussion of the matter by such gentlemen, there was no doubt that the truth must sooner or later be unveiled.

Mr. Hanbury said he did not think that Dr. Tilden professed that his remarks on the subject were derived from experience. He merely argued that aloin was little used, and therefore of little use.

Dr. Cook said that while aloes themselves were not easily alterable by chemical agents, aloin was susceptible of alteration, and he explained some experiments he had made.

Mr. C. H. Wood said he thought that the paper of Dr. Flückiger embodied what must be a growing conviction in the minds of many that the crystalline principle obtained from aloes varied considerably,—that one description of aloes would yield one principle and another description would yield another. He believed that was also the impression which Dr. Tilden had derived from some of his recent investigations on the subject. He had several samples of aloin that had been prepared from different kinds of aloes, and he must confess that they did not appear to him to be absolutely identical. They wanted to know whether the Messrs. Smith claimed that the aloin was the exclusive purgative of aloes, or whether the other parts were equally purgative. There were certain circumstances which seemed to him to suggest that the other parts were equally purgative. The aqueous extract of aloes was considered to be as efficacious as aloes, and yet the aqueous extract yielded little or no aloin. By many the extract was considered as efficacious as aloes and aloin. It would be important if they could obtain larger numbers of samples of aloin from different kinds of aloes, and ascertain how far they were identical.

Mr. A. W. P. Smith said that if aloin was admitted to be active in the doses mentioned by the medical gentlemen in their reports read to-day, if it was active in these doses, how were they to account for anything else being active, because the doses fully accounted for all the activity of the aloes? They had got aloin from all the kinds of aloes, but they confined themselves to the Barbadoes. The aloin that had been found fault with was made from a different kind of aloes than those they used.

Mr. Deane said that from time to time he had been in the habit of examining aloes under the microscope, and had found invariably that the largest amount of crystalline structure was to be found in Barbadoes aloes. Fine samples of Barbadoes aloes varied considerably under the microscope. It was generally a mass of crystals, cemented together by a transparent substance, which was possibly as active as the crystalline portion. In the preparation of aloin he conceived there was a great loss from some change which occurred in the process. For many years he had to make pills of aloin for one or two ladies, and though they could not take aloetic pills, so called, they could take aloin pills with the greatest comfort. From what he had seen there must be great advantage to some persons in the use of aloin. Altogether he thought the subject one well worth further investigation.

Dr. Attfield said he would like to ask the Messrs. Smith or Dr. Cook if they could enlighten the members as to the constitution of aloin.

Dr. Cook said that at present he had no information on the subject; but he hoped they would in time arrive at some kind of chemical decision on the matter.

Mr. A. W. P. Smith said that Mr. Hanbury remarked that Dr. Tilden's idea about the activity of aloin was that it was little used because it was of little use.

Mr. Hanbury.—Little used according to *his* (Dr. T.'s) observation.

Mr. Smith said it seemed strange for those living in the North to hear such a statement, because he did not think there was a dispensing chemist in the whole of Scotland that had not aloin in his stock. It appeared to him that those living in the South were far behind in the matter of aloin.

Dr. Procter said that he had used aloin himself with considerable advantage and success, and greatly to the comfort of his patients; but he must also say that he felt satisfied that the resinous matter had a purgative effect. He had used the resinous matter and had found it to be an aperient. He found that while the aloin acted without any unpleasant feeling, the resinous matter did produce very unpleasant effects indeed.

Mr. A. W. P. Smith.—Is it not possible that in the resin there might have been some active aloin about it?

Dr. Procter.—That seems to be a matter of dispute.

Mr. T. Smith.—It is possible that some of it might have been in it, the resinous matter not being readily exhausted.

Mr. Bottle said it appeared to him that aloin had not the same medicinal effect in the South as it had in the North. Mr. Smith would perhaps remember, twenty years ago, that he called on Mr. Bottle at Dover, and that aloin was introduced there. The use of it was not, however, satisfactory, and he had still the remnant of that very stock which he bought from Mr. Smith. It was possible that he was not supplied at that time with the article which Mr. Smith manufactured now-a-days.

Linseed and Linseed Meal.

BY THOMAS GREENISH, F.C.S.

Although the linseed-meal poultice is by no means a modern invention, yet the first mention of it (*Cataplasma Lini*) occurs in the Pharm. Lond. of 1836, where it is directed to be made with *bruised linseed* (*Sem. lini contriti*), and the same applies to the Pharm. of 1851; but in the Pharm. Brit. of 1867 the terms used are linseed meal, and the explanation which accompanies it is "the cake of linseed, from which the oil has been pressed, reduced to powder." In some establishments to this day a crushed linseed is kept for sale to the public. It has, however, been found that this seed is too rich in oil to be kept long in such a condition, as the oil it contains, when so exposed to the atmosphere, rapidly oxidizes and acquires a degree of rancidity which is very injurious when the poultice made from it is applied to open wounds. In consequence of this defect it has become the custom of the trade to use a much less oily article, which is simply the meal produced by grinding and sifting the dry linseed cake of commerce. The directions respecting this article of the Materia Medica, found in the last edition of the 'British Pharmacopœia,' 1867, attempt to solve the difficulty by directing the *powdered* linseed cake to be mixed with olive oil in the proportion of 2 fluid oz. to the pound when sent out for use, which is necessarily a very inconvenient practice.

In addition to the inconvenience caused by this oxidation of the oil, another has arisen by reason of the impurity or adulteration of the linseed cake, from which the "Lini Farina" is produced, and it is the object of this paper to point out how the difficulties may be avoided, and a true "Lini Farina" be prepared, which, while it keeps well in the pharmacy, will also meet the requirements of the Pharmacopœia, and act efficiently when sold to the public.

It being one of the objects of this Conference to direct attention to adulterations, it becomes the duty of its members to point them out, and, if possible, to prevent them. This remark applies with force in the present case, as the "Lini Farina" enters into the composition of no less than five preparations of the British Pharmacopœia.

The result of any investigation of this subject must necessarily be imperfect without a reference to the history of the linseed as imported into this country. Russia is the great linseed-producing country of Europe; and previous to the Crimean War our supplies were almost entirely drawn from St. Petersburg, Archangel, and other ports of the North; also from Odessa, Taganrog, and other ports on the coast of the Black Sea in the South. But during the Russian War these ports were blockaded, and the difficulty then experienced in obtaining the required supplies led to considerable importations from India; and such an impetus was thus given to the growth of linseed, that the quantity now imported from the East is larger than that received from Russia, which has never fully recovered her trade.

Even before the war, linseed had always more or less of foreign seeds mixed with it, and was shipped in a very impure condition; but it was during the scarcity caused by the war that it became so very much adulterated, and the principal seat of that adulteration was Odessa.

At that time there existed in this country no institution for checking the growing evil, but this check was ultimately provided by the formation of the "Linseed Association of London."

(Samples of linseed were shown as imported previous to, and during the war, to illustrate how loaded it was with impurities.)

There must necessarily be found mixed with every kind of linseed a certain amount of wild seeds gathered during the operation of harvesting. This is especially the case with "flax dodder," which is a parasitical plant; but as all, or nearly all, the accidental seeds are smaller than the linseed, proper screening should remove them.

Careless harvesting and positive adulteration had, however, reached such a pitch that, in 1864, importers and crushers founded an association called the "Linseed Association," and agreed in future to buy and sell on L. A. terms, which were that 4 per cent. only of admixture should be allowed, and that all beyond that proportion should bo more or less a loss to the merchant. These terms were soon understood and conformed to by the shippers; and there is consequently, at the present time, no difficulty in procuring linseed almost pure; neither, on the other hand, is there any difficulty in procuring linseed with a large admixture of weed seeds, for at the present time Riga and St. Petersburg seed, and probably others, may be purchased without reference to L. A. terms; and, when it is understood that there are sometimes from 12 to 15 or 20 different foreign seeds mixed with the linseed, and that the whole adulteration may amount to 30 per cent., it will be seen how wide a margin there is left for unscrupulous crushers of linseed.

(Samples were exhibited showing a great improvement in linseed imported after the L. A. was established.)

It will also be observed that there exists much difference in size between the Russian and the Sicilian or East Indian linseed. The linseed grown in a tropical climate does not produce so fine a quality of oil, but it yields a larger amount of farina, and makes a more nutritious cake, and of the different samples of East Indian linseed before you, that from Bombay has the preference. The small seed grown in a cold climate, however, yields the linseed oil most esteemed by painters and varnish makers for its excellent drying qualities.

It is in the East Indian linseed, the best for its farina, that the wild rape and wild mustard are found, usually not alone, but mixed with grass seeds, and it is to these pungent seeds of the Natural Order *Cruciferæ* that our especial objections apply, the volatile oil being developed on the addition of the hot water necessary to form a poultice.

[There are here samples of flax dodder found chiefly with seed from the Russian ports; also wild rape, wild mustard from the East Indian linseed, and others, probably grass seeds.]

It would be well for those who reside in agricultural districts and may be called upon to examine linseed-cake, to make themselves especially acquainted with the microscopical characters of linseed, and for that purpose I cannot do better than refer them to some interesting remarks on the subject in the PHARMACEUTICAL JOURNAL, February 18, 1871, page 663, by our President Mr. Stoddart.

I will just mention here a case where the agricultural mind has been imposed upon. Wild charlock or corn-mustard seed, of little or no value, is mixed with turnip seed (which it much resembles), and is then sold as genuine turnip seed, but, previous to its being mixed, it is subjected to a temperature sufficient to destroy its germinating property. When the mixed seed is sown, the turnip consequently only comes up, and the fraud is not discovered, "for dead men tell no tales." Charlock is usually met with in English linseed, which is not used by crushers.

The ordinary linseed-meal of commerce, as I have previously remarked, is usually made by grinding and sifting a very dry linseed-cake; this is generally an imported cake, as English-made cake always contains water, whilst the foreign cake must have been thoroughly dried to have stood the voyage without becoming mouldy or heated. Fresh English linseed-cake ordinarily contains 10 per cent. of water, and such a cake, if ground into meal, would not keep well. The foreign cake is chiefly imported from New York and Marseilles.

In the United States linseed is pressed for its oil as it is here; the consumption of linseed-oil in that country being greater than the home supply, it is supplemented by purchases of oil made in England, but the cake is not used for fattening cattle to the same extent as it is here, consequently they are able to export cake for the English market; they are thus buyers of oil and sellers of cake.

This imported and impure cake is the material from which the ordinary linseed meal of the shops is prepared, and though largely and extensively used, does not fulfil the requirements of British Pharmacy. Its price, one-half that of the pure farina of crushed linseed, is a sufficient indication of its character and quality. Sometimes the farina of crushed linseed is mixed with this cheap meal so as to reduce the price, and the mixture is thus sold with a semblance of purity.

The conclusion at which I have arrived is, that most of the linseed-meal of commerce does not come up to the required standard of the Pharmacopœia. On the other hand, a great deal of that which is commercially pure is not elegant, containing either too much oil or too large a quantity of husk, sometimes both, and that which is the produce of foreign cake can never be relied on, inasmuch as it contains irritating matter, which has in many instances on record resulted in considerable mischief.

To produce a good "Lini Farina," the linseed (preference having been given to that from Bombay or Sicily) should, after being passed through the rolls, have a portion of its oil expressed without heat, then be ground, and afterwards have the husk sifted out; the resulting farina, when mixed with hot water, will then assume a gelatinous consistence, and be quite free from volatile pungency such as that of mustard, and, if kept in a cask lined with tin, it will remain good for several months. This, in my opinion, is the "Lini Farina," best adapted for a linseed-meal poultice, a therapeutic agent seldom properly made, generally despised, but for which there has not yet been introduced an efficient substitute; and I trust that some crusher who may have his attention drawn to the contents of this paper will make it his business to prepare a "Lini Farina" for pharmacists in conformity with these suggestions.

In conclusion, I would submit for your examination, samples of true lini farina, pure English cake, good American cake, inferior American cake, from which the meal is ground and the linseed-meal of the shops.

The CHAIRMAN said that his experience rather astonished him. When he went to the West of England first, in Worcester, the rate was threepence for linseed and sixpence for linseed-meal; but when he got to

Bristol the rate was sixpence for linseed and threepence for linseed-meal. The quantity used in Bristol he would back against any place. With regard to adulteration, linseed cake was awfully adulterated. He had no hesitation in saying, from his experience of analytical work, that it was adulterated to the extent of at least fifteen per cent.

Mr. Bell said that there was more linseed imported into Hull than into any other town in England, and perhaps there was more adulteration there. Linseed cake was frequently adulterated with buffum. He had great objection to using linseed meal on account of that. With regard to crushed linseed, his experience told him that it was the best. He bought it in small quantities, and it kept its properties to the last.

Mr. Deane said that for a long portion of the time he had been in business he had been in the habit of using the ordinary ground cake, believing it to be the thing that was intended to be used, but a few years ago a curious circumstance occurred. He gave to a person, for a domestic purpose, some linseed-meal, and in the course of some days he was told that where any portion of the poultice had fallen on the patient it produced a blister. On making inquiry into the subject, and a careful examination by the microscope, he found that the mischief arose, as he believed, through the mixture of Cruciferous seeds which the linseed contained. Probably these were not seeds put in intentionally, but arose from careless culture and careless dressing. They formed part of the crop, and had been sent out without regard to consequences, because they added to the bulk. He had been in the habit for many years of using crushed linseed, taking care to have it in such quantities that it would not spoil by keeping. It was a curious circumstance with regard to the seeds grown in some parts of Europe, that they made the finest oil for painters, provided they were not contaminated by those wild seeds. From all he knew about linseed, he thought it should make all chemists very careful as to what kind of linseed they made use of. He was quite satisfied that if the linseed-cake was genuine—ground cake, free from contamination—it made an excellent poultice and kept better than the other. But as there was difficulty in getting that, it was better to get the crushed linseed from a respectable house rather than run the risk of getting meal from cake, the history of which they knew nothing about.

Mr. Atkins said that he could testify to the large amount of meal consumed in the West of England. The ordinary linseed-meal or crushed cake cost about 14*s*. per cwt., and the crushed linseed about 32*s*. The retail price at Salisbury was 4*d*. for linseed-meal and 6*d*. for linseed, whole and crushed.

Mr. Collins said, with regard to the linseed they had from India, that there was great carelessness shown in the docks. They would find rice-seeds and all other kinds of seeds amongst it; and very often when the men were turning the sacks the seeds fell down and were freely mixed. Very often the bags were made so loose in texture, that various kinds of seeds fell through and mixed with the linseed. That was one of the reasons why the Indian seed was so much complained of through the packing in the ship's hold.

Mr. Bottle said he had found difficulty in getting the proper linseed meal. He had discarded it and purchased crushed linseed.

Mr. Mackay said that the pharmacist had no reason to go away to the West of England in order to get a really good linseed-meal. Some years ago he was a good deal bothered about this article. It was not unlike the American meal, and the dreadful thing was it had this peculiarity, that it was so hard that the ordinary means of making it into a poultice were unsuccessful, and the hardness of the particles caused a great deal of trouble, annoyance, irritation and even pain. He tried many places; he even went to England, and the experiences he had were exceedingly unsatisfactory, until he fell on crushers of seed not far from Edinburgh, Wacklin, Ruddock, and Co., and from experience he could say that their linseed-meal was very good, and 5 per cent. cheaper than in some other places. If pharmacists applied to that firm for a sample of their linseed-meal, he had no doubt that they would be satisfied.

Mr. Hanbury said that during his business experience in London, the firm with which he was connected used to keep the crushed linseed and the powdered cake, but the latter was scarcely ever required.

Mr. Frazer said that in Glasgow, considerably above twenty years ago, the crushed seed was first brought under his notice by a Liverpool house. He found it to be a genuine article and at once introduced it. He had since then ceased to keep the article made from the cake; and, notwithstanding its higher price, had found the public gave the crushed seed a most decided preference.

Mr. Greenish considered that the objection urged against "crushed linseed," that it oxidized very rapidly, was met by the sample on the table, from which a portion of the oil had been expressed, and in that condition, if properly kept, it would remain good for a reasonable length of time. As to Mr. Collins's remark with reference to admixture at the docks, all he could say was that it had not come under his notice.

Mr. Collins stated that in the docks he had seen it to a considerable extent.

A Member said that he thought they would like to know the results of the crushing of the seeds, with reference to the amount of oil that was given off by the different seeds which came from the various countries. If these had been given, the paper would have been more valuable. There was an old article of domestic use called carron oil. Could any member inform him whether linseed-oil had been used for the manufacture of that? It would evidently affect the carron oil if it contained many of these seeds. It was still much in use and more preferred in domestic use than the finer article, olive oil.

Mr. Deane said that linseed-oil made a sort of paint, olive-oil did not.

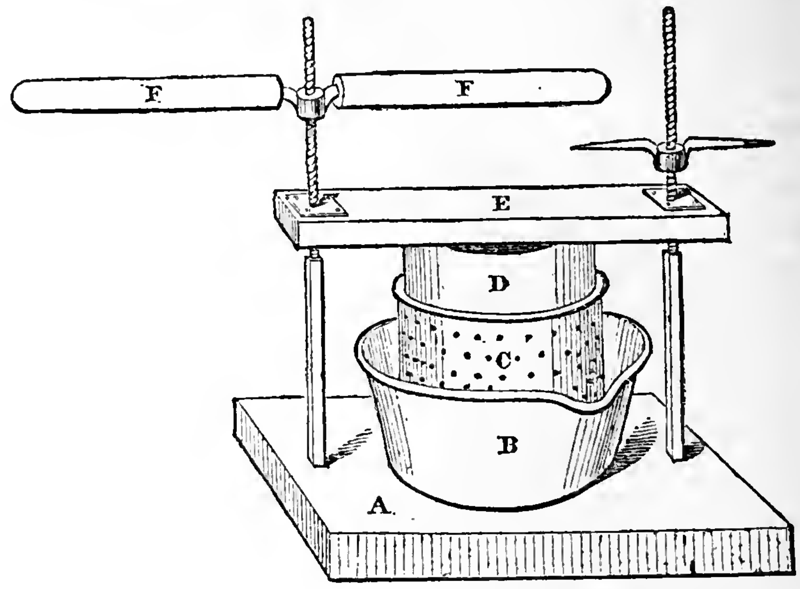
Mr. Greenish, in reply, said the average quantity of oil in linseed was from 25 to 30 per cent., and probably 10 per cent. of that would be pressed out in making the farina. With reference to the quantity of oil from different seeds, those from Bombay and Calcutta yielded a much larger quantity than the Russian seed, but any reference to this point would involve a larger subject and have no practical bearing on the present question.

Dr. Attfield read a paper on

The Tincture Press.

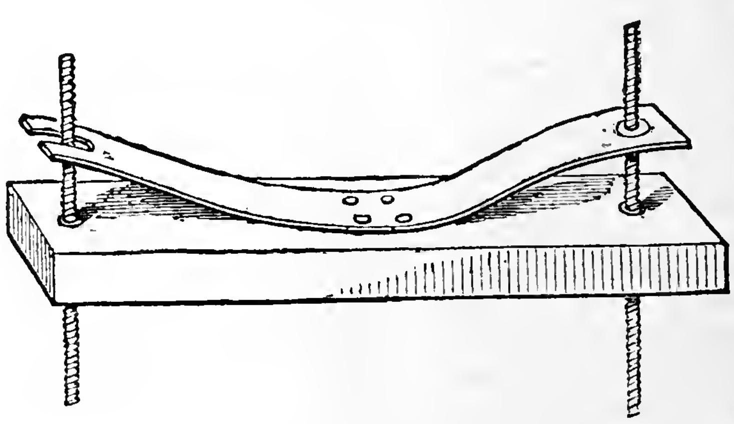
BY C. A. STAPLES.

The tincture press is one of the most important implements in the pharmaceutical laboratory. Without its judicious use, not only would the loss of tincture be very great in quantity but in quality also, the latter portion of which is obtained by the press being the richest in extractive matter. Indeed, the preparation does not fairly represent the Pharmacopœia article until it has been thoroughly expressed, and the products mixed together. Such being the value and importance of the tincture press, I have often felt surprised that so little improvement has been made in it. The workmanship has certainly been brought to a degree of perfection that cannot fail to command our highest admiration, but the faults remain. The first defect that strikes the intelligent mechanician is the severe torsion of the screw. The implement is usually constructed with a powerful cast-iron frame, in which the female screw is fixed, the male screw being turned by a lever. The effect of this method of applying the power is a tendency to force the screw out of the perpendicular. But it would bear a much greater power without injury if such power were applied to the female screw or nut. To make myself better understood, imagine a wire hanging from a beam, load it, and notice the enormous weight it will bear without injury. Now reverse the position, and try to support the weight at the top, it will require a much stronger wire to act as a pillar, or it will bend and the weight come to the ground. Now this may be compared to the screw of the press: the power applied being usually expressed as equivalent to so many pounds weight, this is sometimes enormous, and will be understood by the following simple calculation. In a small screw press, such as is usually found in the pharmaceutical laboratory, the lever radiates from the centre, say 12 inches, it would travel a circumference of over 72 inches for each revolution of the screw. Now place the rule to the screw, and note the number of threads to the inch; if 6, this would give $72 \times 6 = 432$, as the number of inches the lever travels for each inch of pressure obtained; that is to say, the power is multiplied 432 times. Now if we imagine a force equal to 100 lbs. applied to the end of the lever (and this is but a moderate estimate of a man's strength), it would give $432 \times 100 = 43{,}200$ lbs. as the weight, such pressure would represent; or, we may compare the screw of the press to a column supporting a weight of nearly *twenty tons!* How is it to support this prodigious weight? Evidently only by increasing its bulk, and consequently the friction, cumbersomeness and expense of the implement. It may be objected that these figures are somewhat theoretical. I use them as an example of the laws by which the force of mechanical powers is usually computed, but I am sure it will be readily conceded that if well applied, the power of a good screw-press is very great, and that if cases do arise where it fails to meet the requirements of the pharmaceutical laboratory, they must be extremely rare. The next defect to be noticed in the iron frame press is its rigidity; the pressure ceases the instant the hand is taken from the lever; now to bring the expression of a large mass of tincture to a successful and economical termination will occupy several hours, during the whole of which time it should be subjected to a steady, firm, but elastic pressure. At first it must be very gentle, or the substance will be forced through the holes or the cylinder burst open, but as the process advances, more pressure should be applied, and gradually increased until the full power of the press is brought into use. Now it is evident that this uniform pressure cannot be obtained by an implement, the excellence of which consists in the firmness of its parts, without the uninterrupted labour of some one with his hand on the lever to keep the pressure constantly applied, requiring an amount of time and labour that would add greatly to the cost of the production, and that might be saved by an improvement in the machinery. The next defect we observe is, that an additional vessel (generally an evaporating basin) has to be used to receive the expressed juice as it flows from the spout at the bottom of the cylinder; this may appear a trifle, of which it is frivolous to complain, but where the press is portable, it sometimes causes considerable annoyance and loss. The assistant endeavours to steady the press with his foot, from which it frequently slips, and the basin may be overturned or broken, and the product wasted. Taking all these defects into consideration, and thinking that my slight mechanical knowledge might enable me to design a press in which some of them would be remedied, I drew a rough sketch of my idea, and had the parts manufactured in a simple inexpensive manner, so as to produce a working model, from which I purposed constructing a more perfect and highly finished implement when I had discovered and corrected the faults which only experience could detect. I have endeavoured to represent it as it appears, but I am not a draughtsman, which I trust will be my apology for the rudeness of the sketch.



A is a strong platform of oak plank, into which two square iron bolts secured by broad flat heads are firmly fixed, rising perpendicularly to it, and parallel to each other, and having a screw-thread cut in them about half their length. B is a spouted basin of tinned plate to receive the expressed juice. C is the cylinder of tinned iron plate pierced with fine holes. The block D, of turned wood covered with tinned plate, is forced into the cylinder by the wooden cross-beam E, which has a hole at each end, through which the screws pass, large enough to allow it to slide freely up and down the screws, and armed with a piece of polished iron plate to diminish friction. The power is applied to the nuts or female screws, polished at the bottom and furnished with wooden handles FF, these are purposely omitted at the right to show the form of the nuts as forged by the smith. The cylinder holds half a gallon. I have also one holding about 1 pint. Several of them of various sizes might be used by the same press.

This simple inexpensive implement possesses many advantages; it is light and portable, works easily, has very great power, and as the power is applied in the best manner, the strain is very slight, and the friction less than would be expected. I have had it in use about fifteen years, it has never got out of order, or required any repairs (excepting an accident from undue violence). Of course it would be better if the workmanship were more highly finished (*e. g.* with steel screws substituted for iron), but as my old model is still in such good working order, I have not yet replaced it by the more perfect implement, or discovered the faults that I expected I should have to correct. The only improvement I can suggest is the increase of its elasticity; and this I would propose to accomplish by a powerful steel spring screwed to the centre of the cross-bar, and rising a little from it at each end, somewhat in the form shown in the sketch.



Sketch of proposed Spring.

Without experience I am not prepared to give the exact size and substance of the spring, but I think it should be about 2 inches broad, $\frac{1}{4}$ inch thick in the centre, decreasing to about $\frac{1}{8}$ at the ends. The holes through which the screws pass would be elongated or a slit filed at the end of the spring, care being taken to give sufficient space for it to rise and fall without injury to the screws. In my opinion the spring would effect a great saving of labour. The first effect of the power would be to depress the substance in the cylinder; this offering resistance, further power would force the spring down to the cross-beam. The press being now set aside, the spring would continue to act upon it, the action would thus be somewhat automatic. For a very large press, probably a compound spring (on the principle of the coach-spring) would be required.

Mr. Greenish, Mr. Savage, Mr. Newbiggin and others made a few remarks on the construction of the press, and a general approval was given of it.

Parliamentary and Law Proceedings.

The Alleged Attempt to Poison by a Lady.

On Thursday, August 31, Christiana Edmunds was again brought up on remand before the magistrates at Brighton. The solicitor for the prosecution said that he should on that occasion enter specific charges against the prisoner charging her with attempting to murder Mrs. Beard, the wife of Dr. Beard, and also with attempting to administer poisons with intent to do bodily harm to Mr. Garrett and Mrs. Boys. Since the last examination it had been proved that the prisoner had sent a letter for three ounces of arsenic to a chemist named Bradbury, who had now left the town, and whose successor had given the letter up. Mr. Bradbury was being searched after. The letter had been identified as in the handwriting of the prisoner, though signed as by "Mrs. Wood," the name given by the prisoner to Mr. Garrett to obtain the strychnia.

Mr. Henry Swaysland, son of a bird-stuffer in Queen's Road, Brighton, was then called, and stated that he fetched the body of a dog from 16, Gloucester Place, which he gave to Mr. Brazenor.

Mr. Brazenor, bird-stuffer, Lewes Road, said he took the body of the dog in question from last witness, and on opening it, found that the dog had been poisoned. His reason for believing that the dog was poisoned was because its limbs were very limp, and the vertebral column was bent inward. There was a peculiar smell about the dog's throat and lips, and a large quantity of saliva about the mouth. He could not state what poison was used, but was certain it was not prussic acid.

Mr. J. Netherclift, of 18, Golden Square, London, an expert in handwriting, was then called, and said he had examined the writing on the outside of the paper sent to Mrs. Beard, and also on the wrapper in which the cakes which were sent to her were enclosed, and he identified the handwriting as being the same as that of letters of the prisoner. The letter addressed to Mr. Garrett was also in her handwriting, and also a note addressed to Mr. Curtis.

Mr. S. P. Blaker, surgeon, said that he had attended Margaret Knight in her illness, and placed some vomit in two bottles, which he carefully sealed up, and delivered to Inspector Gibbs.

Inspector Gibbs deposed to delivering the bottles to Mr. Rogers, on the 21st of last month, numbering them two and three. He also delivered some cakes, which he received from Mrs. Beard on the 13th, to Professor Rogers, and also some preserved fruit.

Professor Rogers, examined by Mr. Stuckey, stated that Inspector Gibbs had delivered to him the vomit in two jars, and also a parcel of cakes and some preserved fruit, and a handkerchief. He had analysed all these articles, and partly tested the handkerchief. Jar No. 2 contained arsenic in most decided quantities, and the jar No. 3 also contained arsenic, but in smaller quantities. The handkerchief gave traces of arsenic. There was no other poison in these three articles. If the first vomit had been examined, he had every reason to believe that it would have been found to contain more arsenic than there was in either of the two jars he had examined; did not think there was sufficient in jar No. 2 to destroy life; but it was enough to be highly injurious. It was the common white arsenic that was used. On examination of the cakes he found that one of them had on it a dangerous quantity of arsenic. The arsenic was sprinkled over the cake. A second cake contained arsenic on it in the same way, but less in quantity. On two other cakes and some fragments there were mere traces of arsenic. There were several grains of arsenic on the first cake, and it was his intention to state, on a future occasion, the exact amount. All the four preserved fruits had arsenic on them, and one was literally stuffed with it. The arsenic found in one was enough to have destroyed the life of any one. Witness here stated that he had also examined two peaches which had been sent to Mr. Garrett, and found they had been covered with strychnine. The peaches were very much decomposed, but there was strychnine all over them. The quantity was, he believed, sufficient to have caused death.

Mr. Netherclift was recalled, and stated that a letter, which was found at the residence of Mr. Bradbury, was in the same handwriting as the other letters.

Mr. Thomas Glaisher, of the firm of Glaisher and Kemp, was then shown a letter, which he stated was not written by him or by any one in his establishment. The letter was one sent to Mr. Garrett, purporting to order a quantity of arsenic.

Mr. Black, coroner of Brighton, stated that the letter produced was not in his handwriting, and was not written by his authority. The letter purported to come from him, and requested Mr. Garrett to send his "Sale of Poison Book."

Emma Helsay: She was parlour-maid to Mrs. Boys, 59, Grand Parade. She recollected a parcel coming by a railway van on the 12th of August, addressed to Mrs. Boys. On the following day she was in the housekeeper's room, and saw the nurse taking some cakes from a box like the one produced, and putting them in a dish. There were two gingerbread cakes, two cheesecakes, two macaroons, two plum-cakes and two tartlets, done up separately for Mrs. Boys. A piece of thin paper was wrapped round these. The nurse broke in half one of the tartlets in the paper addressed to Mrs. Boys, and they ate half each. About ten minutes after she felt very sick, and had a burning in the throat. Her legs ached, and felt drawing up. Those sensations lasted until ten o'clock that evening,—about eleven hours,—when she began to get better, but it was nearly a week before she felt herself quite well. The nurse was very unwell—much worse than her.

Mrs. Boys then deposed that there was also in the box a piece of paper, which she tore up; on it were the words, "I send you some cakes for your two little girls. Those directed to yourself are my first efforts. I hope to see you soon.—Your old friend, G. N." Witness put the box into the garden-room, and the next morning gave it to the nurse of the two younger of witness's little girls. On the morning of the day after the parcel arrived she was sick two or three times. In consequence of the child being so unwell, and the nurse and parlour-maid unwell also, she gave certain directions to the cook with reference to the box; one of the tartlets was preserved, and in the afternoon she took a portion of it to Messrs. Glaisher and Kemp's; the other portion of the cake she gave to Mr. Blaker. Witness did not eat any portion of the cake herself. Had never seen the prisoner before, but was in the habit of visiting at Mrs. Beard's.

Amelia Mill, nurse to Mrs. Boys, said: On the 11th of August she received some cakes in the box produced from Mrs. Boys. She ate part of one of the tartlets, and about a quarter of an hour afterwards she felt very sick, and about one hour afterwards she was taken very sick indeed. She felt a burning sensation in the throat and chest. Her sickness continued all the afternoon and evening. She felt very giddy, and trembled very much for three or four days. She continued very ill. Mr. Blaker, the doctor, saw witness about eleven o'clock that night, and was in attendance on her for nearly a week; it was quite a fortnight before she recovered. Both of Mrs. Boys' children had a part of one of the currant cakes; the younger child, five minutes after eating the cake, became very ill; the other child only had a very small piece of the tart, and after dinner she looked very pale and ill. Witness was obliged to make her lie down. Both the little girls were in good health before they partook of any of the cake.

Mr. Blaker, M.R.C.S., stated that he was sent for by Mrs. Boys on Friday, the 11th, to see the nurse and parlour-maid. The nurse was constantly vomiting, and was suffering from pains in the stomach, and, to use her own words, was "indescribably ill." Witness attended the nurse for more than a week. From the symptoms, he believed that she was suffering from an irritant poison, which he believed to be arsenic. He had a piece of one of the cakes given to him by the cook, which he put on the top of a high press in the kitchen. He received from Mrs. Boys a portion of a cake, which he took to the dispensary at the hospital. It had a substance upon it which looked like sugar. Subsequently he received it back from the dispenser, and handed it to the inspector of police.

Mr. Smith, dispenser at the Sussex County Hospital, said that on the 12th of August he received a package from Mr. Blaker, containing some cake. He analysed fifteen grams of the cake for arsenic, and found it to contain five decigrams and eight centigrams; of sulphide of arsenic, between seven and a half and eight grains. This was a sufficient quantity, in his opinion, to destroy life.

The case was then adjourned.

The prisoner was brought up again, on remand, on Thursday, September 7th.

Evidence was then given tracing a piece of cake from Mrs. Boys to Messrs. Glaisyer and Kemp, and from them, through Inspector Gibbs, to Professor Rogers.

Professor Rogers said:—He remembered receiving several packets, numbered 5, 6, and 7, from Inspector Gibbs. He had analysed their contents. Each packet contained a piece of cake, and each piece of cake contained a quantity of arsenic, a dangerous quantity. The piece of cake in packet No. 7 weighed 57 grains, and of that there was about a grain and a quarter of arsenious acid, or white arsenic. The arsenic was in the proportion of eleven grains and two-tenths to an ounce of cake. He could not state whether the arsenic in this specimen had been mixed with the cake before it was baked, as it was much crumbled up.

Mr. Samuel William Bradbury was then called. He stated that he resides at Alton, in Staffordshire. In July last he had a shop at 21, North Road. About the 21st of that month he received a letter of that date (now produced). It was enclosed in an envelope, and was delivered by a boy at his shop. He did not know the boy. He supplied the article ordered in the letter—three ounces of arsenic.

Mr. Netherclift stated that the letter was in the same handwriting as the others. [The letter, which was read, purported to be from Messrs. Glaisyer and Kemp, and requested him to supply them with three ounces of white arsenic, of which they were in immediate want, and to send it by the bearer.] The witness continued—He wrapped it in three papers and gave it to the boy, who tendered him a shilling. He charged three-halfpence for the arsenic, and the boy took it away. Did not know the boy.

It having been intimated that the prisoner would reserve her defence, she was then committed for trial on the charge of attempting to poison Mrs. Beard.

The prisoner was then charged with causing the death by poison of a boy named Sidney Albert Baker. The evidence given was, to a great extent, similar to a portion of that brought forward at the inquest on the boy and already reported (p. 17). In addition two boys were produced, who said that a lady, whom they believed to be the prisoner, had sent them to Mr. Maynard's to purchase creams. On their return with the creams the lady had told them they had brought the wrong sort, and sent them back to change them. The theory put forth by the prosecution was that the lady in question was the prisoner, while in her possession the creams were tampered with, and that they were afterwards returned to Mr. Maynard, and placed by him with his other stock.

Dr. Letheby said he had analysed the chocolate creams given him by Inspector Gibbs. They contained a great deal of strychnia, generally in the proportion of 5 grains to the 100. The minutest portion would be extremely bitter. Each of the large chocolate drops contained five or six grains. One grain might be regarded as a fatal dose, but half a grain has been known to destroy life.

The prisoner was then further remanded till the next day.

Poisoning by a Lotion of Corrosive Sublimate.

An inquest was held a day or two ago by Mr. Kemm, coroner, at Elm Grove, Chippenham, the residence of Mr. R. N. Fowler, M.P., touching the death of Mr. Fowler's daughter, Harriet Maria, a child nine years of age. Mr. Goldney, M.P., was foreman of the jury. Mr. Keary, solicitor, of Corsham, attended to watch the proceedings on behalf of Mr. Fowler, and Dr. E. M. Meeres, of Melksham, under whose care the deceased had been placed, was also in attendance.

Elizabeth Saturley, nurse, said that on Friday, the 1st inst., the deceased died at about a quarter to eight in the morning. On Monday, the 21st August, witness had taken her to Dr. Meeres, at Melksham, to have her head examined. He said she had ringworm, and gave her a lotion to wash the head with twice a day, and some medicine. She applied the lotion and gave the medicine as directed. Dr. Meeres called on the Wednesday following and ordered the head to be shaved, which was done the following day, and the lotion and medicine were continued as before. On Monday, the 28th, Dr. Meeres saw deceased at the house, and said witness was to have her head washed, and to take her to him at Melksham in the afternoon, and he would put an application to the head that he hoped would kill the disease at once. She took deceased to Dr. Meeres' house, and he applied a liquid from a bottle with a small brush, and cautioned the deceased not to open her eyes. He said if a little ran down her neck it did not matter. Some of the liquid ran down the neck behind the ear. The application gave the deceased no pain at the time. Witness brought her home in an open dog-cart almost immediately. During the journey she suffered great pain, and she appeared in great pain after reaching home. Witness applied cold cream and cold water to her face, but did nothing more until Dr. Meeres had seen her again the same evening. He seemed surprised to see how much the head and face were swollen in so short a time. Deceased continued in great pain all night. The next morning they sent for Dr. Meeres, and he ordered cold water pads to be applied over the eyes and forehead. He was asked if there was any danger, and he assured them there was not. Deceased still got worse, and they told Dr. Meeres they should have further advice. They telegraphed for Mr. Gore, of Bath. Mr. Gore and Dr. Meeres saw deceased together about five o'clock in the afternoon on that day. The swelling continued to get worse, and deceased got no sleep on the Tuesday. She was constantly inclined to be sick, and took no food on Wednesday. The head began to blister the same evening as the lotion was applied. Mr. Gore ordered tepid water pads to be applied. On Wednesday evening Dr. Meeres gave deceased a composing draught about five o'clock, and about ten o'clock witness gave her another. The deceased slept about two hours that night. All day Thursday she seemed very drowsy, and also on Thursday night. About a quarter to eight on Friday morning she died. On being cross-examined by Dr. Meeres as to whether she seemed surprised when he came, witness said he did. Witness also said he made use of the expression, "He did not care about the liquid running down the neck." The mouth was very much swollen, which prevented deceased taking any solid food. Her lips were also swollen. She could swallow liquids. After Mr. Gore's visit some other medicines were ordered, which she took.

Mr. R. T. Gore, of Bath, said that he saw the deceased first between five and six o'clock on the afternoon of Tuesday, August 29, in company with Dr. Meeres. The head and face were a good deal swollen, and there were remains of blisters on the head and on the neck. There were also some spots on the head and face, apparently the remains of an eruptive complaint. The gums were somewhat swollen and tender. Dr. Meeres told him to what circumstances the appearances were to be attributed, viz. that he had applied a strong lotion of corrosive sublimate on the day previous. Witness said he rather regretted the strength of the application that had been made, as from experience he knew such applications were not free from danger. He did not see deceased again alive, as he was from home on Friday when sent for. From the blistered state of the head when he saw it, it was impossible to distinguish the exact nature of the eruption. He thought the swelling of the mouth and head, and the general symptoms, were undoubtedly occasioned by the application, and were the effects of an over-strong application of such a remedy. In cases where there were abrasions of the skin, such applications would often produce not only local symptoms, but general symptoms of poisoning, such as those in the present case were. He considered that the corrosive sublimate used was undoubtedly the cause of death. He did not at first know the strength of the application, but he afterwards found it was a very strong one.

Dr. Meeres requested permission to make a statement on oath to the jury, as he thought himself the person best acquainted with the case, and most deeply interested in putting the whole of the facts candidly before them. He was cautioned by the coroner as to the possibility of any statements he might make being used as evidence against him. He then said that on that day fortnight the deceased was brought to him at his house. She was then suffering from ringworm. At first he gave her a tonic, and a lotion to wash the hair. As it seemed to spread, he ordered the head to be shaved, and the previous treatment was continued until last Monday, when he found the ringworm was spreading over the head. He requested her to be brought to him in the afternoon, for the purpose of using some application to destroy the ringworm, which was a sort of fungus in the skin. On the Monday when she was brought to him he applied, with a brush, a solution of bichloride of mercury, commonly called corrosive sublimate. The formula was taken from Dr. Tilbury Fox's work on skin diseases. He took the book to the chemist, Mr. Laine, of Melksham, and ordered him to make up the prescription according to the formula given therein. The mixture was made specially for this case on the Monday, and the strength was ten grains to the drachm, or eight grains to the ounce, dissolved in alcohol. The effect of this application was always to blister, and it was intended to do so. According to Dr. Fox it was never absorbed into the system, but the effect was always local. In the present case, unfortunately, the mixture by some means got into the system and produced salivation. He had on some previous occasions used the same application, which he made up himself. He was present when the chemist made up the mixture, and he saw the ingredients weighed out and gave him the printed formula to go by. There were some scratches about the forehead of the deceased which he avoided in applying the lotion. He was satisfied none went into the abrasions, but if it had, no ill effect would have followed, as the effect of this strong application was to coagulate the blood at once. He knew it would cause a blister, but he had no recollection of having told the nurse that if some went on to the neck of the deceased it would not matter. If it had gone into the eye it would probably have blinded it. The previous lotion was quite innocuous, and was given merely for the purpose of cleansing the head. He continued to attend the deceased until her death. On Thursday night he thought the swelling of the mouth was abating. There was no doubt the mercury by some means got into the system and produced the symptoms described. He had applied the same mixture and the same strength to children of about eight years of age. No mercury was given internally in the present case.

After clearing the room the jury unanimously concurred in the following verdict:—"That the said Harriet Maria Fowler came to her death on the first day of September instant from the effects of poison caused by a very strong preparation of bichloride of mercury having been applied to the head and neck of the deceased by Dr. Edward Evan Meeres, on the 28th of August last past, whilst under his care for an eruption on the head; and the jury are of opinion that great blame attaches to the said Dr. Edward Evan Meeres." The coroner and jury expressed their condolence with Mr. and Mrs. Fowler on the melancholy occurrence.—*Daily News.*

Extraordinary Charge of Manslaughter against a Chemist.

On Thursday, August 31, the magistrates at Sidmouth were engaged in investigating the charge against Mr. Robert Webber, chemist, for feloniously killing and slaying William Wall, Esq., at Salcombe Regis. Evidence was given that in the latter part of July deceased sent a prescription of an opiate to defendant to make up. Defendant sent a mixture, but five minutes afterwards discovered he had made a mistake, he having put twenty grains of morphia, with directions that half was to be taken at once. He immediately despatched messengers to Mr. Wall's house and sent for a doctor, but before either reached the place the deceased had taken half the quantity as directed, so that when the doctor arrived the deceased was senseless. Efforts to arouse him were fruitless, and he died five hours afterwards. At the inquest the jury did not think the defendant's carelessness sufficient to constitute manslaughter. The Home Secretary, however, had taken up the affair, and ordered the present magisterial proceedings.

Medical evidence was called to show that there must have been great carelessness to make such a mistake; whilst another doctor said, although he himself should not have made the blunder, yet it was quite possible that a person might have made even a worse mistake, as the writing of the prescription was very bad.

The Defendant was committed for trial for manslaughter.—*Standard.*

Attempted Suicide by Essence of Almonds.

At Worship Street, on Friday, September 1, Flora Warner, a servant in the employment of a City company, was charged on remand with having attempted to commit self-destruction by taking a quantity of essence of almonds. The facts of this case were of a most painful nature. The prisoner held a respectable situation, and was much respected. Her employers gave her a holiday on the morning of the Foresters' *fête* at the Crystal Palace, so as to afford her an opportunity of going there with a party of friends. About eight o'clock the following morning she was seen by a watchman in Holywell Lane, Shoreditch, in the act of taking something from a phial which she raised to her mouth. He called the attention of a police-constable to her, and she was removed to the surgery of Dr. Phillips, in Spital Square. There an emetic was administered, and she got better. The phial taken from her hand was labelled "poison" in large letters, and after the prisoner had been remanded a summons was ordered for the attendance of the doctor who sold the stuff to the prisoner. He was now present, but his name did not transpire. In reply to the magistrate, he admitted selling the poison in the bottle produced, which he said held about half an ounce. He could not say if the quantity sold was sufficient to destroy life, but the bottle was not full. It was essence of almonds. He had questioned the prisoner, and she had stated that she wanted it to flavour jellies, etc.

The magistrate remarked, that it was necessary to know how such poison came to be sold, but he had been under the impression that it was oil of almonds, and not essence.

The doctor said that he should not have sold oil of almonds to the prisoner without she had been introduced to him by some one he knew, but essence of almonds was an article of daily commerce, and much used by pastry-cooks, etc., for flavouring custards, blancmanges, etc.

The magistrate then ordered the prisoner to be given up to her father, who was in attendance, and who promised to take care of her.—*Daily News.*

Accidentally Poisoned.

At the adjourned inquest, held on Wednesday, 23rd August, on John Bullock, the old man who was accidentally poisoned at Aston on the 25th of July, the jury considered that Hunter was highly censurable for his carelessness, and that Mr. Hoare was also blamable in not attending to Bullock immediately when called in.

VACANCIES AND APPOINTMENTS IN CONNECTION WITH PHARMACY.

The Editor will be glad to receive early notice of any vacancies of pharmaceutical offices connected with public institutions, and likewise of appointments that are made,—in order that they may be published regularly in the Journal.

APPOINTMENT.

Mr. Theophilus Weaver, A.P.S., late Dispenser to the South Staffordshire General Hospital, Wolverhampton, has been appointed Dispenser to the Birmingham New Parish Dispensary.

BOOKS RECEIVED.

On the Relative Powers of various Substances in Preventing the Generation of Animalcules or the Development of their Germs; with Special Reference to the Germ Theory of Putrefaction. By John Dougall, M.D. London: J. and A. Churchill. 1871.

Analytical Tables for Students of Practical Chemistry. By J. Campbell Brown, D.Sc., F.C.S. London: J. and A. Churchill. 1871.

The following journals have been received:—The 'British Medical Journal,' Sept. 2; the 'Medical Times and Gazette,' Sept. 2; the 'Lancet,' Sept. 2; the 'Medical Press and Circular,' Sept. 1; 'Nature,' Sept. 7; the 'Chemical News,' Sept. 2; 'Gardeners' Chronicle,' Sept. 2; the 'Journal of the Society of Arts,' Sept. 2; the 'Grocer,' Sept. 2; 'Produce Markets Review,' Sept. 2; the 'English Mechanic,' Sept. 1; the 'Pharmacist' for August; the 'American Chemist' for August; the 'Canadian Pharmaceutical Journal' for August; the 'Practitioner' for September; the 'Food Journal' for September; the 'British Journal of Dental Science' for September.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

The Council of the North British Branch of the Pharmaceutical Society.

Sir,—The head and front of the offence committed, according to Mr. Fairlie's opinion, by the members of the Pharmaceutical Society residing in Edinburgh, has been to call the local committee by the name which it has so long enjoyed. He pleads not only that it is a misnomer, but one likely to mislead. Giving your correspondent more credit for apprehension than it appears he deserves, I wrote a reply to his first communication, in which I pointed out the origin of the name, stating that the "high-sounding title" had been used unchallenged for nineteen years. Mr. Fairlie is still apparently resting on thorns and feels uncomfortable regarding the matter, and with the desire of giving him, if possible, some relief, I will endeavour to make our position in Edinburgh, past and present, plainer still, premising, that he had better again peruse my first reply.

As already explained, a distinct clause in the Act of 1852 appoints an examining body to sit in London and in Edinburgh. At the time the Bill was passed it was felt that there ought to be two centres, one in London and one in Edinburgh, for the operation of the affairs of the Society; and had this not been conceded, the name of "Great Britain" could not have been employed, as Scotland would have rebelled. It is true that powers were also taken to make the examining boards peripatetic, if such was felt to be a necessity, and this power, although never acted upon, still exists. This, however, is widely different from appointing and constituting other boards throughout the country, with all the requisite machinery for conducting the examinations as they ought to be.*

In connection with the existence, then, of the Board in Edinburgh, it became a necessity that a committee should be appointed to look after various matters in connection with the existence of such a Board. A museum required to be founded and a library commenced, in order that certain facilities should be given to young men coming to Edinburgh to pass their examinations, and at the same time scientific meetings were established, at which papers were read and the operations of the Society conducted. These gentlemen formed and still form the Council in Edinburgh. The name, as has already been explained, was given by Jacob Bell, and the funds requisite supplied by the parent Society. A glance at the 'Annals of Pharmacy' since 1852 will tell whether the Council here have since their formation done their duty. Throughout bygone years billets were freely sent both to large cities and country towns, and the tale can be told by many of how seldom came a response, while the presence of friends from a distance at any of our meetings, annual or scientific, always gave much pleasure.

From what I have said, Mr. Fairlie will now, I trust, be able to draw the distinction between the recognized London Council of the Society and the local position of that of the North British Branch. We have neither claim nor power to issue voting-papers for our Council in Edinburgh. All mem-

* The clause referred to by our correspondent (15 & 16 Vict. c. lvi. sect. 9) is as follows:—"And to enable the said Society to provide for the examination in *Scotland* of such students, apprentices, or assistants in *Scotland* as may desire to be examined there, it shall be lawful for the Council of the Society, and they are hereby required, to appoint such fit and proper persons in *Scotland,* to meet in *Edinburgh* or *Glasgow,* or such other place or places as the Council may think desirable, and to conduct there all such examinations as are provided for and contemplated by this Act, with such and the like powers and authorities in respect thereof as are herein conferred, and to grant to the persons to be so examined such and the like certificates as are hereinbefore specified and referred to, or to refuse the same; and all the provisions of this Act shall be equally applicable to the examiners, examinations, and parties examined in *Scotland* as to the examiners, examinations, and parties examined in *England.*"—Ed. Pharm. Journ.

bers, whether in England or Scotland, have the power of voting for the legally-recognized members of London Council, whether they reside on the one side of the Tweed or the other; but there is not and cannot be a second or antagonistic Council in Edinburgh or anywhere else; and if Scotch members generally were entitled thus to vote for the N. B. Branch Council, clearly our English friends would have the same right and privilege. But our constitution is purely local, and our doings and actings must stand for what they are worth. Courtesy and a desire to cultivate good feeling, have induced us to try and get our friends in the country to co-operate with us, but hitherto, I regret to say, with little success.

The attempt made by your correspondent of paraphrasing the proceedings and actions of the Society in Edinburgh, may be considered by Mr. Fairlie as clever, but to my mind it is as ungenerous as it is unjust, while in some respects his statements are at variance with truth. When Mr. Fairlie is able to take museum, library, money grant, honour, and all from us, then Macaulay's prediction will be near its fulfilment, only changing the site and seat of the savage from London to Edinburgh; while, to extend the simile, Arthur's Seat may be expected to be seen as an ornament in front of the Glasgow Royal Exchange. As for the hundred and odd pounds so lavishly expended annually for so many years in Edinburgh, I am constrained to say it only exists in Mr. Fairlie's imagination, and I would recommend him to examine bygone accounts, and wait the issue of the destination of the last grant made by the Society to its branch in Edinburgh, before he indulges in such a hasty and wild statement. It may, however, cause some surprise for Mr. Fairlie to know, that a strong feeling exists in the minds of many, that as in Edinburgh there has really existed, and still continues to show vitality, a part of such a powerful Society as the Pharmaceutical, there ought to be an establishment more worthy the position and name of the North British Branch, and that possibly such feelings may yet find an outlet in some practical form.

With regard to your new and unnamed correspondent who shrouds himself and his habitation under the letters "*M. P. S.*," let me say that when Mr. Bell came to Scotland about the 1852 Bill, he paid a visit to Glasgow, and many still alive can testify to the stirring appeals which he made at a public meeting held there, for sympathy and aid, in the great and good work in which he was engaged. Let a review of what Glasgow has done since then in matters relating to pharmacy tell the amount of his success, and prove whether I was wrong in stating that for many years the Metropolis of the West has been in a state of lethargy. If "*M. P. S.*" knew in detail all the work which "Mr. Mackay and his Edinburgh friends" have had to do in their own locality during the same period, to uphold the character and standing of the Society, he would, I am sure, free them from the charge of having neglected Glasgow or any other town in Scotland. The fact is there ought to be neither recrimination nor jealousy. We are all banded together for one common good, and I can truly say it causes me personally very much regret, when attacks such as the present are made, for I have yet to learn to what extent Mr. Fairlie or his friends in Glasgow are injured or aggrieved, by gentlemen acting for the Society of which they form a part, under a distinctive name, but not interfering in any way, with the proceedings of members of the same Society, in any part of Great Britain. For I assert that the Local Council here, under a name which they have now used for about twenty years, are fully entitled to meet, deliberate and decide on any matter connected with the Society; and having done so, to send up unchallenged to the Council in London such an expression of their opinion; and this being a free country, it is equally open to the committee of any other town to do the same thing.

One word more to "*M. P. S.*" To carry out his original idea of moving the Board further west, in order to save young men their expenses in coming to Edinburgh, he must apply the same argument to all parts of the country, England, Scotland and Wales, and thus establish Boards, not in the west only, but throughout the length and breadth of the east, west, north and south.

I trust our future conduct in Edinburgh will so commend itself to Mr. Fairlie, that he will be prevented from coming, torch in hand, with such fiery intentions as that of setting "the heather on fire." It is true we cannot draw supplies of the cool element from the grand natural reservoir, Loch Katrine, but he may rest assured he will find plenty willing and able hands to assist in preventing the utter ruin of our Branch here, by such a conflagration as he seems to threaten in the closing portion of his letter.

Streathearn House, Crieff, JOHN MACKAY.
4th Sept. 1871.

Sir,—The letter of Mr. Fairlie, in last week's Journal, contains statements as to the conduct and motives of our Edinburgh brethren so directly at variance with my experience, that I feel bound to protest against their being received as correct.

During a long acquaintance with Edinburgh pharmacists, dating from 1853, I have never seen any evidence of the jealousy attributed to them by Mr. Fairlie, but have always found them earnestly desirous that our city should take a place in pharmacy in accordance with its rank and importance in the State, perfectly willing that examinations should be held here if necessary, and ready to aid in anything that might further our progress.

No doubt the Council of the North British Branch is elected by Edinburgh members, but the fact that three of its number belong to Glasgow shows that these elections are not influenced by a spirit of exclusiveness.

In addition, Mr. John Mackay repeatedly urged us to endeavour to send a representative to the London Council, and when Mr. Frazer, of our city, consented to be a candidate for the office, his nomination was at once welcomed in Edinburgh, and every effort made to secure his election.

Mr. Fairlie rightly says, that we have received nothing but kindness at the hands of our Edinburgh brethren, and I regret extremely that he should have allowed himself to publish such charges against a body of men of whom he can comparatively know so little.

ALEXANDER KINNINMONT.
69, *South Portland St., Glasgow, September 6th,* 1871.

POISON REGULATIONS.

Sir,—Mr. Schweitzer, of Brighton, in his letter of the 28th ult., assumes that all who support Government interference in the internal arrangements of the drug shops of this country, act upon the much talked of "regulations" in the storing of poisons in their establishments; and that all who object to Government interference in the matter do so because they are unwilling to act on such regulations in the conducting of their business. Mr. Schweitzer further assumes that the opposition to Government interference is confined to the pharmacists of the "back streets of London and other towns." When Mr. S. has proved these theories of his to be also facts, it will be time enough to discuss the arguments founded on them.

Glasgow, September 2nd, 1871. FRAZER AND GREEN.

Sir,—Last week Mr. Schweitzer, in the opening sentence of his letter, stated that the Brighton poisoning case was the immediate cause of its appearance, though, as he wisely makes no further reference to it, we have, I think, the right to claim his assistance in tracing the connection between cause and effect. I say *wisely*, because the Brighton case proves, if it proves anything, the small value of the legal safeguards of which he is so strong an advocate. On the evidence of good taste and good temper contained in his reference to "back streets," I need make no remark,—such insinuations can only harm those who make use of them, and are best left unanswered; but why should Mr. Schweitzer attach so extravagant a value to the opinions of the gentlemen who represent the leading houses he mentions? That, individually, the views of many of them are entitled to great respect I should be the last to deny, but that respect is in no way increased by the accidental circumstance, that they have the right to hide their identity under the signatures of historic firms; on the contrary, I think it may be fairly argued that this is a question on which their views are entitled to less weight than on many others connected with the trade. Is it not a fact that they carry on business under conditions, differing so materially from those of smaller concerns, especially in poor neighbourhoods, as to afford them no experience on which to form a sound estimate of the difficulties and vexations which beset their less fortunate brethren? As to the remainder of the letter, it is simply irrelevant. How often must we remind our opponents that it is not the sale but the storing of poisons that is under discussion? Is it not strong evidence of the weakness of their case, that they so persistently endeavour to confuse two distinct questions one of which has already been settled by the Legislature?

Far be it from me to suppose that I can influence Mr. Schweitzer. Unlike him, however, I have no objection to argue with those "who do not wish" to be convinced, but only with those who refuse to be, and such letters as his and that of Mr. Balkwill, in a recent number of the Journal, justify us in classing the writers among the latter, and in supposing that it would require something much stronger than reason to make an impression on their prejudices.

CHARLES EVE.

Hampstead, September 4th, 1871.

Sir,—I do not think Mr. Schweitzer's letter and the estimate he forms of his contemporaries in general, ought to pass unnoticed. His inequitable partiality nearly equals that of Squire Western, in Fielding's novel, who wished the whole human race might go to perdition rather than his Sophy should suffer injury to her little finger. Why should the names of those dead people, Bell, Dinneford, Godfrey and Cooke, etc., or their living representatives, or even the managers of the establishments bearing such names, "carry more weight than all the chemists of the back streets of London and other towns taken together"? And, in point of fact, one of those eminent persons, if it were possible to recall him from Elysium and consistency remained among men, would assuredly never "sign any petition in favour of legislative interference."

If the appeal to authority were conclusive, I consider the opinion of Mr. Schacht, who is capable of taking a clear and temperate view of the situations, and of conveying his thoughts to the public in good and forcible language, should avail more than the appeal to a multitude of abstractions. We hold the great metropolitan houses in due respect, but may be allowed to believe there are fifty shops in London where dispensing is quite as well done; and that, too, under the vigilant supervision of a principal whose faculties are quickened by a sense of personal interest and individual responsibility. The same may be affirmed of many a country business; no doubt of Mr. Schweitzer's among the number. A druggist always ought to know, and generally does know, how to order his own affairs better than any extraneous person can instruct him. For my own part, as an Englishman, I claim, or at least desire to retain, the power of conducting my business in the manner which I believe most beneficial to the public interest and to my own. Those who are enamoured of despotism and eager for restraint, are entitled to enjoy their strange opinion. But there is an assumption of superiority in their tone which is unpleasant to the other members of the trade. "Liberavi animam meam."

Truro, September 4th, 1871. S. FEAVER.

Sir,—Like many others I also am quite tired of reading discussions on poison regulations, and would not write a line on the subject but that I think a correspondent last week made some grave mistakes, either from want of experience in country life or from prejudice. I will venture to say that the names of firms like Bell, Dinneford, Godfrey and Cooke, Hanbury, Savory, etc. are not worth more than those of all the chemists in the back streets of London; moreover, in my opinion, they are worth absolutely nothing in comparison with numbers of chemists both in London and the country. Are some half-dozen first-class firms in London competent persons to hold the leading-strings of the country on such a subject as the keeping and dispensing of poisons?

How would they manage if their bread depended not on a high-class trade where 1*s.* may be charged for a single pill, but on one in which they had to supply a number of agriculturists with corrosive sublimate, arsenic, etc.? There are many such businesses in the country, and in most of them dispensing, etc. is, nevertheless, carried out as strictly and correctly as in the first establishments in London. Since we, as a body, cannot agree on the subject, I think it best we should be silent, and agree to differ for the future; let each tub stand on its own bottom; let those that wish for law make one of their own, and those that think differently continue as they think best.

A WEST COUNTRYMAN.

[*** We have inserted these letters—as we did that of Mr. Schweitzer—reluctantly, and simply in the desire to afford to all a fair opportunity of expressing their opinions, and defending themselves. But it is evident that there is no longer any need for continuing this course, and that it might rather be prejudicial than otherwise. We therefore decline to publish any more letters on the subject until such time as it may have assumed such new aspect as may demand further notice. Meanwhile, we commend to our readers such a careful consideration of all that has been written and done in regard to the disputed subject of poison regulations, as may enable them to contribute towards a removal of the difficulties that have distracted British pharmacists during the past few months.—ED. PHARM. JOURN.]

J. David, G. Brownen, "Sempervirens" and *J. S. H.*—We have received the enclosures. They shall be attended to at the termination of the vacation.

"*Ferrum.*"—The iron may be used again, if necessary.

M. M. B.—You will find the names of some firms where you might obtain what you require printed at Vol. I. p. 480, but we cannot undertake to recommend any particular house. You should consult a directory.

"*Theta.*"—Several formulæ for hair dyes have already been given in this Journal. Further information might be obtained by communicating with the Editor of the *Hairdressers' Chronicle.*

G. Brown.—The last edition with which we are acquainted was published in 1866, by Asselin, Place de l'Ecole de Médecine, Paris, price 15, 16, or 17 francs, according to the binding. It might be obtained direct, or through any foreign bookseller.

"*A Country Member*" writes, in reference to the discussion on the merits of Extractum Carnis in last week's Journal, to mention as a somewhat noticeable fact that his dog will not touch food in which Liebig's Extract has been mixed, but will eat with the usual relish the same food containing gravy made in the ordinary way.

A. P. S. (Wolverhampton).—If you had added the spirituous preparations last, you would not have experienced the difficulty referred.

Charles J. Bell (Wellingborough).—(1.) The proper way is to distil the oil with water, and to apply the usual tests to the distillate. (2.) Yes, providing a registered chemist and druggist were engaged.

R. and Co.—It would be necessary for the seller to put on a 3*d.* stamp, or to have a sweet wine licence.

J. Bingley.—The hydrochlorate of morphia may be kept in solution by using a larger proportion of solvent. It requires twenty parts of water for solution. See a paper on the subject by Mr. Martindale, PHARM. JOURN., 2nd Series, Vol. XI. p. 480.

B. R.—The quantity of liquor potassæ is insufficient to form an emulsion. Mucilage, or yolk of egg, would have answered the purpose better, though, of course, it would have been improper to have used them in the case referred to.

R. B. S. (Salford).—The Pharmacy Acts are, 31 & 32 Vict. cap. 21, and 32 & 33 Vict. cap. 117. These and other Acts referring to the qualifications of chemists and druggists and to the sale of drugs, may be found in the Calendar of the Pharmaceutical Society of Great Britain, which can be obtained from the Registrar, price 1*s.* 3*d.*

Philip Miller (West Derby).—We are at a loss to account for your experience.

ERRATUM.—*The Pharmacy Bill.*—Mr. Schweitzer writes to say that in his letter of last week, the sentence:—"Names like Bell, Corbyn, Dinneford, Godfrey and Cook, Hanbury, *Savage*," etc., should be read:—"Names like Bell, Corbyn, Dinneford, Godfrey and Cook, Hanbury, *Savory*, etc., carry more weight than all the chemists of the back streets of London and other towns taken together."

COMMUNICATIONS, LETTERS, etc., have been received from Mr. C. H. Southwell, Mr. G. Burrell, Mr. J. R. Jackson, Mr. W. Gill, Mr. G. Cocking, Messrs. J. Sanger and Sons, C. M., N. O. P., R. B. S., "Philos," "Fair Profit," "Chemicus" (Sheffield). "Chemicus" (Redditch), "Amara" and "Anonymous" are referred to the rule as to anonymous correspondence.

CHEMICAL AND PHYSIOLOGICAL RESEARCHES UPON THE NATURE OF THE PURGATIVE PRINCIPLES OF ALEXANDRIAN SENNA.

BY MM. E. BOURGOIN AND E. BOUCHUT.

Senna has been successively analysed by Bouillon-Lagrange and Braconnot, then by Lassaigne and Feneulle, and more recently by Ludwig, Batka, Kubly and Dragendorff.

Bouillon-Lagrange prepared an aqueous distillate, which had a nauseous odour and was slightly purgative, but he failed to isolate any definite principle. The same may be said of Braconnot, who attributed the properties of senna to a bitter substance of a complex nature, obtained from the watery extract.

The results obtained by Lassaigne and Feneulle in 1821 are most important. Those chemists prepared a substance to which they gave the name of cathartine, and to which they attributed the special properties of the senna. It may be remarked in passing that the name cathartine ought not to be retained in science, for the product which it denotes is not a definite substance.

According to Dragendorff and Kubly, senna owes its properties to a particular acid—cathartic acid; but these writers, like the preceding, gave no precise details by which their assertion could be substantiated.

In consequence of these contradictory results, it was thought by the authors that it would be interesting to make a fresh investigation of the subject, particularly to determine the nature of the body or bodies to which the purgative properties of senna are to be attributed.

After some preliminary experiments which it is unnecessary to report, the following was the method adopted in this delicate research.

One kilogram of picked Alexandrian senna was treated with ten times its weight of boiling distilled water; after standing twenty-four hours it was expressed, and the resulting liquor filtered and evaporated by a water-bath to two litres. Then its own volume of alcohol was added, which caused the formation of an abundant precipitate that was separated. The liquid, cleared from this principle, was reduced by evaporation to the weight of one kilogram. From this product might be prepared, on the one hand, the cathartine of Lassaigne and Feneulle, on the other, the cathartic acid of Dragendorff and Kubly.

In this memoir will be examined in the following order—(1) the mucilaginous matter; (2) the liquid extract; (3) the cathartine of Lassaigne and Feneulle: (4) a new substance, ? catharto-mannite; (5) the cathartic acid; (6) the chrysophanic acid of the senna.

1. *Mucilaginous Matter.*

Mucilaginous matter exists in large quantity in senna, to the extent of about one-tenth of its weight. It is separated immediately by adding to a concentrated infusion an equal volume of 45 per cent. alcohol. Left to stand, it collects upon the surface of the liquid, whence it may easily be taken, and should then be washed several times with alcohol to free it from the liquid extract with which it is impregnated. When afterwards dissolved in its own weight of water, a solution is obtained that is slightly clouded and sluggish, with a mucilaginous flavour, not at all bitter. This is the solution with which the experiments were made, and which has yielded the following results.

Physiological Effects.—We have administered the mucilaginous matter of senna to fifteen children of from five to thirteen years of age, in doses of five, six, ten and fifteen grams.

Eight times, that is to say in more than half the cases, it had no purgative effect; two of these children had griping pains, but beyond that no appreciable disturbance was noticed either of feverishness or loss of appetite.

Upon the other seven it had a slight purgative effect, characterized in three by a single muddy evacuation, and by two to four yellowish liquid evacuations in the others; but in neither case was there any fever.

In order to compare the action of this mucilaginous matter derived from senna with the liquid extract described further on, the following experiments were made.

To a child twelve years of age who had taken successively six grams of mucilaginous matter, and the next day ten grams, without any purgative effect, was given on the third day ten grams of liquid extract, which caused two liquid painless evacuations.

To a child fourteen years of age, to whom fifteen grams of the mucilaginous matter had been given without producing any sensible effect, was administered on the following day, 15 grams of the liquid extract, which caused two liquid evacuations with griping pains.

From this it appears that the mucilaginous matter of senna, when in a pure state, is not purgative in doses up to 15 grams, which would be equivalent to 150 grams of the leaves, and that without exceeding such dose, abundant evacuations are not produced by it. It is, however, easily explained how it is that the mucilaginous matter of senna sometimes exercises a slightly purgative action. The product of Dragendorff and Kubly, which, as will be seen, is purgative, is insoluble in concentrated alcohol; it is probable, therefore, that a small quantity of that substance is contained in the mucilaginous matter from which it is difficult entirely to eliminate it.

As a result of these experiments it appears that the mucilaginous matter ought not to be regarded as one of the purgative principles of senna.

2. *The Liquid Extract.*

The infusion of senna, deprived by alcohol of the mucilaginous matter, was evaporated in a water-bath at a gentle heat, so as to drive off the greater part of the alcohol, and to obtain finally a quantity of liquid equal in weight to the leaves originally used. The liquid so obtained is of a dark brownish-yellow colour, and possesses a bitter, slightly nauseous flavour. It gives no precipitate with water or proof-spirit, but with absolute alcohol it yields an abundant precipitate, which will be referred to further on.

Physiological Effects.—The effects of this liquid, which represent, properly speaking, the infusion of senna, are, as might be expected, very marked upon the secretions and the contraction of the intestines. This has already been noticed in comparing in the same patient the purgtive a action of this preparation with that of the preceding. But without making comparisons, the energetic action of the liquid extract shows itself in an absolute manner by the extent of the effects produced. Thus the liquid extract was administered to thirty-one children, of ages varying from five to fifteen years, and only three patients were met with upon whom it did not have a purgative effect.

It was administered in doses of from 6 to 30 grams. In the three cases in which it had no effect, only 10, 15 and 20 grams had been administered.

In two cases there was but one motion; in seven cases, two motions; in two cases, three; in six cases, four; in five cases, five; in three cases, six; and in three cases, seven. These evacuations were yellowish, liquid, more or less abundant, and after the purgation there was neither uneasiness nor fever.

Some of the patients suffered from nausea, some from griping, and some vomited. One of the patients upon whom 20 grams of the liquid extract had no purgative effect, vomited, which doubtless explains the absence of purging. Three others had nausea, and fourteen altogether had colic pains, which shows the convulsive intestinal action of the preparation employed.

3. *Cathartine.*

In the preparation of this product, Lassaigne and Feneulle adopted a rather complicated method. The senna was first exhausted with ether, then the residue was treated by water and partially distilled. The decoction remaining in the retort, expressed and filtered, was afterwards treated with neutral acetate of lead, which gave a plentiful precipitate that was rejected. The liquor, deprived of any excess of the reagent by a current of sulphuretted hydrogen, was taken up again by rectified spirit, and the alcoholic solution evaporated to the consistence of extract; this was afterwards dissolved in alcohol acidulated with sulphuric acid, then filtered to separate the insoluble sulphate of potash that was formed. After precipitating the sulphuric acid by acetate of lead, separating this last reagent by sulphuretted hydrogen, filtering anew and evaporating to dryness, cathartine was obtained, a substance which, according to those authors, stands in the same relation to senna as emetine to ipecacuanha.

The treatment by ether, and the distillation, are two useless operations. A product exactly similar may be prepared much more simply in the following manner:—Digest one kilogram of senna in two different quantities of from eight to ten times its weight of distilled water; raise it to the boiling-point and then leave it to cool; after twenty-four hours press strongly and filter. Mix the two liquors and evaporate to one litre, which treat by its volume of spirit to separate the mucilaginous matter. Evaporate the spirit by a water-bath, and add to the residue neutral acetate of lead, which will give rise to a plentiful precipitate that is to be rejected. Separate the excess of lead by sulphuretted hydrogen, then filter, evaporate to a syrupy consistence, treat with rectified spirit, filter, and add carefully very dilute sulphuric acid as long as there is any precipitate; filter again, and evaporate by a water-bath.

The substance so obtained is of a reddish-yellow colour, with a bitter nauseous taste, recalling that of senna. It is hygrometric, soluble in water and in spirit, but not completely insoluble in ether, as indicated by Lassaigne and Feneulle. An aqueous solution gives an abundant precipitate with subacetate of lead, and becomes darker under the influence of alkalis.

Physiological Effects.—In order not to employ doses capable of injuring the patients, at first 20 centigrams were given, then 1 gram to children from six to thirteen years old. No effect following, the dose was raised to from 5 to 10 grams, according to the age of the children.

In seven cases where cathartine was administered in 5 gram doses, there was but one with a negative result. In the other six there were from one to four liquid evacuations, twice accompanied by nausea and three times by griping pains, but in none of them was there any vomiting, uneasiness or fever.

Three times the cathartine was given to the elder children in doses of 10 grammes. The purgative effect was not very strong, there being but one, two and four motions, without nausea or vomiting, and in only one case with pain.

If it be remembered that senna only yields about one-thirtieth of its weight of cathartine, it will be seen that this preparation evidently has not the strength of the liquid extract, and consequently cannot pretend to represent by itself the purgative principle of senna.

4. *A New Substance* (*Catharto-mannite ?*).

This substance, which is very soluble in water, insoluble in concentrated alcohol and in ether, is obtained as a secondary product in the preparation of cathartine. The process is as follows:—After having separated the mucilaginous matter from the infusion of senna, the solution is concentrated, and acetate of lead added to it; the liquid is filtered, deprived of excess of lead by sulphuretted hydrogen, and evaporated to a syrupy consistence, then treated with concentrated alcohol: the insoluble residue contains the substance in question. This is dissolved in a little water and precipitated afresh by alcohol. After repeating this treatment two or three times, the product did not appear sufficiently pure for chemical analysis; but, nevertheless, it was thought advisable to submit it to a few clinical experiments, in order to determine its therapeutic value. It was dissolved in sufficient water to give a ten per cent. solution.

Physiological Effects.—Doses of one gram were administered to five children without producing any effect. There were neither nausea, gripings nor evacuations. Two days afterwards the same children each took 2 grams of this product; the result was equally negative. The same want of success was experienced the following day with 5 gram doses, no uneasiness being produced. These five children not only were not purged, but appeared rather to be constipated under the influence of this preparation. In consequence of this result 15 grams of the liquid extract was given to each of these children, which produced in every case plentiful evacuations.

5. *Cathartic Acid.*

This acid was prepared in the following manner: An infusion, made with one kilogram of Alexandrian senna, was concentrated so as to obtain one litre of product, to which was added its volume of 75 per cent. alcohol. The precipitated mucilaginous matter was separated by filtration; then the liquid was evaporated to a syrupy consistence and precipitated by absolute alcohol. This new treatment yields a blackish body, which was dissolved in water and precipitated by dilute hydrochloric acid. The resulting product, which was the impure cathartic acid of Dragendorff and Kubly, was dissolved with heat in proof spirit. Finally, the solution so obtained having been partially evaporated, and exactly saturated by a weak solution of potash, the cathartic acid was again set free by hydrochloric acid. One kilogram of senna yields six to seven grams of cathartic acid so purified.

This acid is insoluble in water. In order to administer it in an aqueous solution, and in a state analogous to that in which it appears to exist in the plant, that is to say as a salt, it was exactly saturated with a weak solution of potash, so as to obtain a one per cent. solution; each gram of this solution consequently answering to a centigram of cathartic acid.

Physiological Effects.—The solution of cathartic acid so prepared, was given to children of from six to fifteen years of age, in doses of from 15 to 30 grams. Of seven patients who had taken the smaller dose, in four cases it was without effect; of the other three cases, in one there was one stool, in one three, and in one four, without nausea or vomiting, but with some griping. In two other cases where 30 centigram doses were given, but one single evacuation resulted, without nausea, vomiting or pain.

It appears, therefore, that the cathartic acid does not by itself represent the whole of the purgative action of senna. Supposing that senna contained one-hundredth part of its weight of this acid, which is certainly the maximum, 30 centigrams would correspond to 30 grams of the leaves, and, consequently, to 30 grams of the liquid extract. It has been shown that the latter, with this dose, exercises a much more energetic action.

6. *Crysophanic Acid.*

It has been remarked that the cathartine of Lassaigne and Feneulle was not a definite principle, but should be considered to be a mixture of many substances, of which one at least is purgative. Without seeking to define exactly the nature of this mixture, which one of the authors intends to do ulteriorly, it appeared interesting to ascertain to which portion of the product the purgative properties of cathartine might be attributed. This was done in the following manner:—

The cathartine was briskly agitated with ether, deprived of alcohol, and this treatment was repeated many times, as the exhaustion is difficult. The ethereal solution, of a strong yellow colour, was evaporated in a water-bath. The residue having been taken up by absolute alcohol, the filtered solution was evaporated to the consistence of an extract. A product, containing two different principles, was thus obtained, one of them a colouring matter, and the other possessing all the properties of the acid still indefinitely described under the name of chrysophanic acid. This substance is nearly insoluble in water, strongly soluble, on the contrary, in alcohol and in ether; its solution, which is yellowish, and reddens tournesol paper, acquires a beautiful red colour under the influence of alkalis. The salts so formed are very soluble in water, which allows of the separation of the organic acid by means of acetic acid. This product was made up into pills, each containing 10 centigrams.

With a dose of 60 centigrams there was no effect. With a dose of 1 gram a decided purgative effect was obtained.

However, it is willingly acknowledged that the action of crysophanic acid would not be precisely the same as in these experiments, since in these it was not used in a state of purity. It is proposed in another investigation to operate with crysophanic acid, obtained from rhubarb, and not from senna, this last appearing to contain but a very small quantity, which explains why the presence of the acid in it has been doubted by some experimenters.

From the preceding result, it would appear that the purgative principle contained in cathartine should be present in the portion insoluble in ether. This, in fact, is found to be the case. Deprived by ether of all matter soluble in that vehicle, cathartine has given the following results. Upon a patient fourteen years old, 2 grams in a draught produced uneasiness, loss of appetite, nausea, some griping, and five evacuations. In a second case, upon a young girl of twelve years and a boy of the same age, the same dose gave rise to exactly similar symptoms.

Conclusions.

It results from the facts mentioned in this memoir that senna cannot be classed with the plants that possess but a single purgative principle. It is evident that to this circumstance must be attributed the difficulties that have hitherto been experienced in the analysis of this substance, and the uncertainty which exists still in science concerning the nature of its active principle.

It has been clearly shown that no single one of the constituent principles of the plant, taken by itself, can pretend to represent the whole of its general properties. In other words, besides chrysophanic acid, which only exists in small quantity, senna contains at least two other purgative principles: one represented by cathartic acid; the other contained in the preparation of Lassaigne and Feneulle improperly called cathartine. This conclusion is evident, as the authors have satisfied themselves, that cathartine contains no trace of cathartic acid.

As a general result of this inquiry, it appears that the best preparation of senna is the infusion, with or without the mucilaginous matter,—such as that described in this memoir under the name of liquid extract, for example,—since only such a preparation contains all the purgative principles of the plant.—*Journ. Pharm. Chim.* (4) xii. 305.

OPIUM PRODUCTION IN EUROPE.

BY DR. C. O. HARZ.

Some fifty years ago experiments to produce opium in Europe were made which were so successful as to strongly recommend to the farmer the cultivation of poppy.

In Germany and Austria the idea did not find much favour, and was soon forgotten, while in France it was taken up and carried out on a large scale. The cultivation of poppy increased year after year, and it now occupies about 50,000 acres, of the value of four and a half million francs, yielding two million francs of opium a year. More recently Mr.

Karsten has revived the interest in the question in Germany, and in several parts of the country trials have been made with most favourable results.

Experiments made at the acclimatization fields, near Berlin, proved that the giant, the blue and the white poppy were best suited for the production of seed on that soil; these three varieties were therefore planted on a well-manured sandy soil, and the opium obtained therefrom showed all the external qualities of a good Smyrna sample, analysed.

	Soluble in Water.	Organic Bases.	Of which Morphium.
Giant Poppy .	66·3 per ct.	13·6 per ct.	9·3 per ct.
Blue „	70·1 „	10·7 „	8·0 „
White „	69·6 „	8·0 „	—

The last sample was in too small a quantity to give exact results.

In 1866, several experiments made near Berlin, viz. at Pankow, Charlottenburg and Hermsdorff, yielded opium containing 10 per cent. of morphium.

Karsten sowed the seed in two lines about 6 inches apart, and separated by about 2 feet distance from the next two lines, so as to allow free passage in gathering in the opium; the young plants were kept asunder about 3 to 4 inches.

About eight days after florescence the poppies were cut, and the milk juice, a few minutes afterwards, collected with the finger in a vessel, and at once evaporated at a gentle heat; the result was of superior quality, containing 66 per cent. soluble in water, and 10 per cent. of morphia An instrument called the scarificator, for making the incisions, was not approved of, but the most suitable instrument was an ordinary garden-knife or penknife, provided with a guard to prevent its making the incisions so deep as to cut through the capsules. This is of great importance, because the cutting through of the poppy-heads is invariably followed by a shrivelling up of the young fruit, so that not only the juice but also the seed is lost.

Mr. Schulze, a schoolmaster at Pankow, commenced in 1867, and he also found it best to collect the fresh juice, instead of allowing it spontaneously to dry on the fruits, giving a much purer quality. Dr. Harz received samples of the opium produced, and found it to contain 10·9 per cent. of morphia; after having been kept for some time in a paper box, it showed the following properties:—It was tough and tolerably hard, greyish-brown, somewhat like German lactucarium, forming a mass of tears of the size of a pea, of waxy surface when cut, with difficulty reduced to a light grey powder. The smell was intense, stronger than that of Smyrna opium, and also resembling lactucarium; the taste exactly like that of best Smyrna.

The tincture made according to the Prussian Pharmacopœia was slightly brown, somewhat like Madeira wine, scarcely one-third so intense in colour as the tincture made from Turkish opium, according to English prescription. Analysis of the sample dried at 100° C. gave, soluble in cold water 49 per cent.; the insoluble consisted chiefly of narcotine, of a resinous mass 7 per cent., and caoutchouc and fat soluble in chloroform 14 per cent.

The aqueous extract, containing 49 per cent. of the opium, and containing besides morphia scarcely 1 per cent. of other bases, was brought nearly to dryness in a water-bath, and extracted with alcohol. There remained 9·4 per cent. of gummy substances and organic salts; the filtrate mixed with water gave, on gradual addition of ammonia, after ten days, 10·9 per cent. crystals of morphia.

The opium was therefore of very good quality, and the separation of morphia was facilitated by the lighter colour of the juice.

In 1868, opium cultivation was commenced at several places in Würtemberg. Mr. Julius Jobst, of Stuttgart, made experiments, which are very valuable, because as the first on a really large scale they established the profitable character of the speculation. Several acres of land were sown with poppy-seed; a fortnight after the fall of the petals the young heads were cut, and the juice collected; this was repeated a second time, but a third incision did not yield enough to pay for the labour. The best time for the incision is the early morning, shortly after sunrise; on hot days, and especially in the middle of the day, only very little juice was produced. The exuded juice, after slight desiccation, was collected in a tin box, the pasty mass was dried in the shade, and wrapped up in poppy-leaves in the shape of small loaves; the manufactured opium formed dark brown cakes, and contained 13 per cent. of morphia.

Mr. Vulpius, pharmacist at Bocksberg, near Heidelberg, produced some opium in 1870, samples of which are now in Dr. Harz's possession for analysis. Dr. P. Sorauer made, at the same time, successful experiments at the Agricultural Experimental Establishment at Dahme, near Berlin; he made the important observation, that the incised capsules yielded more seed than the sound ones, which would increase the profit in a new direction.

The manufacture of olive oil is, in Austria, in a very primitive state, and large sums of money go out of the country to be invested in good salad oil, which if kept at home, and laid out in opium cultivation, would assist in manufacturing a pure poppy oil, exceeding in agreeable taste the olive oil. The incisions must be made in fourteen to eighteen days after the petals have dropped, and, according to Jobst's experience, in early morning. Gastimel, of Cairo, in the *Journal de Pharm. et de Chim.* 1865, draws attention to the fact, that opium obtained from nearly ripe poppies yielded 10 to 12 per cent. of morphia, while another sample, collected directly after florescence, gave a pretty large yield, but contained only 3 to 4 per cent. of the alkaloid. The condition of the soil is of course of importance, although opinions differ on this point; Gastimel finds a well-manured soil to yield opium rich in morphia, while Figari-Bey comes to the reverse conclusion, and the last view is strengthened by Dr. O'Shaughnessy, who observed in East India that opium grown on manured soil contained less morphia than that from an unmanured soil. Certain it is, that newly manured soil acts unfavourably upon the poppy-seed.

In order fully to develope the opium cultivation at home, it will be necessary to settle the following questions, viz.:—

1. Which variety of poppy produces most seed and the best opium, richest in morphia?

2. What influences does the quality of the soil (presence of chalk, manure, etc.) exercise upon the formation of the two products?

3. Which is the most favourable time for cutting the poppy-heads?

4. Does the yield of seed increase with the incision?—*Zeitsch. oestr. Apotheker-Vereines, July*, 1871.

FORMULARY OF ELIXIRS AND PREPARATIONS OF THE NEWARK PHARMACEUTICAL ASSOCIATION.

A short time since we recorded the fact* that the Newark (New Jersey) Pharmaceutical Association had issued a formulary of elixirs and unofficinal preparations, by which they proposed to dispense all such compounds unless specially directed otherwise by the prescriber. The following reprint of this formulary is taken from the *Chicago Pharmacist.*

Wine of Beef and Iron.—

℞ Extracti Carnis (Liebig's) 1 oz.
Ferri Citrat. 96 grs.
Vini Xerici 16 oz.
Syrupi 2 oz.
Pimentæ (contus.) ½ dr.
Aquæ q. s. ft. 24 oz.

Dissolve the extract of beef in 4 oz. of water and add the allspice; after standing ten hours add the wine and syrup, then the citrate of iron, previously dissolved in 2 oz. water: filter.

Each fluid ounce contains: fresh beef, 1 oz.; citrate of iron, 4 grains. Dose—one tablespoonful.

Nutritive Wine. Liebig's Extract of Beef and Wine.—
Prepared same as above, omitting the citrate of iron.

Elixir Calisaya.—

℞ Cort. Cinchonæ flav. ½ oz.
,, ,, (Calisaya) ½ oz.
,, Aurantii ½ oz.
Sem. Coriand. 2 dr.
Cocci Cacti 1 dr.
Spts. Vini Deod. 12 oz.
Aquæ 10 oz.
Glycerinæ 5 oz.
Syrupi 5 oz.

Reduce the barks, etc., to a moderately fine powder, and pack firmly in a percolator; mix the deodorized spirits, water, glycerine and syrup, adding enough water to make two pints of percolate, to which add 20 grains of powdered tartaric acid, and after standing twenty-four hours, filter.

Each fluid ounce contains: 16 grains cinchona bark.

Elixir Pyrophosph. Iron and Quinine.—

℞ Ferri Pyrophosph. 160 grs.
Quiniæ Sulph. 10 grs.
Spts. Vini Deod. 2½ oz.
Syrupi 3 oz.
Aquæ 9½ oz.
,, Flor. Aurantii 5 oz.
Acid. Sulph. dil. q. s.

Dissolve the pyrophosphate of iron in the water and add the syrup; then dissolve the quinine in the orange-flower water, with as little diluted sulphuric acid as possible, and gradually mix them: filter.

Each fluid ounce contains: pyrophosph. iron, 8 grains; sulph. quinine, ½ grain.

Elixir Quinine, Iron and Bismuth.—

℞ Elixir Ferri Pyrophosph. et Quiniæ 16 oz.
Bismuth, Citra-Ammon. 128 grs.
Dissolve.

Each fluid ounce contains: 8 grains pyrophosph. iron; 8 grains citrate of bismuth; ½ grain quinine.

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* Vol. I. p. 1034.

Elixir Pyrophosph. Iron, Quinine and Strychnine.—

℞ Elixir Ferri Pyrophosph. et Quiniæ 16 oz.
Strychniæ 1 gr.
Dissolve.

Each fluid ounce contains: pyrophosph. iron, 8 grains; quinine, ½ grain; strychnia, 1-16th grain.

Wine of Pepsin.—

℞ Pepsin (Hawley's) 160 grs.
Vini Xerici 16 oz.
Acid. Mur. Dil. 1 dr.

Triturate the pepsin with 4 oz. of wine mixed with acid. Pour this upon a filter, and pass the balance of the wine through it.

Each fluid ounce contains: Hawley's pepsin, 10 grs.

Elixir Aromatic.—

℞ Cort. Aurantii 4 drs.
Sem. Coriand. 2 drs.
,, Angelicæ 2½ drs.
Cocci Cacti 1 dr.
Spts. Vini Deod. 12 oz.
Aquæ 10 oz.
Glycerinæ 5 oz.
Syrupi 5 oz.
Percolate 2 pints.

A pleasant vehicle for administering nauseous remedies.

Elixir Val.-Ammonia.—

℞ Ammoniæ Valerianat. 96 gr.
Fl. Ext. Vanil.,
Tr. Cardam. Comp. āā ½ oz.
,, Xanthoxyl, 2 drs.
Syr. Aurantii Cort. 6 drs.
Aquæ 4 oz.

Dissolve the valerianate of ammonia in the water, and add the other ingredients, previously mixed.

Two grains Val.-Ammon. to each drachm.

Comp. Syrup of Hypophosphites and Iron.—

℞ Hypophos. Sodæ,
,, Calcis,
,, Potassæ āā 256 grs.
,, Ferri 126 grs.
Aquæ 12 oz.
Sacch. Alb. 18 oz.

Dissolve the hypophosphites in the water in a water bath, and filter. Add sufficient water to make up for the evaporation. Add sugar—and apply gentle heat to make syrup—21 oz.

Each fluid ounce contains: hypophosphite of soda, lime and potash, 12 grains each; hypophosph. iron, 6 grains.

Compound Syrup of Hypophosphites.—
Same as above, omitting the iron.

Chemical Food.—

℞ Parrish's formula, omitting cochineal and muriatic acid. See U. S. D.

Each teaspoonful contains 1 grain phosphate of iron, 2½ grains of lime and the other alkaline phosphates.

Elixir Pepsin, Bismuth and Strychnine.—

℞ Pepsin (Hawley's) 256 grs.
Bismuth. Citrat. 64 grs.
Strychniæ 1 gr.
Aq. Flor. Aurantii 6 oz.
Spirit. Vini Deod. 2 oz.
Aquæ 4 oz.
Glycerinæ (pur.) 2 oz.
Syrupi 2 oz.

Triturate the pepsin with the water and glycerine, and filter; dissolve the bismuth in 2 oz. orange-flower water, with a few drops of aqua ammoniæ; dissolve the strychnine with a few drops of acetic acid. Add the bismuth solution to the pepsin, then the balance of the fluids, and finally the solution of strychnia.

Each fluid ounce contains: pepsin, 16 grains; citrate of bismuth, 4 grains; strychnine, 1-16th grain.

Ferrophosph. Elixir Gentian.—

℞ Cort. Aurantii 1 oz.
Sem. Coriand. 1 dr.
Macis 1 dr.
Rad. Gentian. 1 oz.
Spts. Vini Deod. 4 oz.
Aquæ 4 oz.
" Flor. Aurantii 2 oz.
Syrupi 6 oz.
Ferri Pyrophosph. 256 grs.

Reduce the roots, seeds, etc., to a moderately fine powder, pack in a percolator—mix the spirits and waters, and percolate 10 ounces. Dissolve the pyrophosphate of iron, add the syrup and filter.

Each fluid ounce represents: 16 grains pyrophosph. iron; 30 grains gentian.

THE COLLECTION OF MASTIC AT CHIOS.

BY M. J. LÉON SOUBEIRAN.

Mastic flows from the *Pistacia Lentiscus*, a Terebinthaceous tree, growing principally in the south of the Isle of Chios, about Cape Mastic, which takes its name from this resin, and is situated about an hour's journey from the city of Chios. According to the natives it exudes, not only from artificial incisions, but also spontaneously from the branches, where it congeals in drops, which, under the name of *dakra* (tears), are gathered separately, and constitute the most esteemed kind. But the bulk of the resin issues from vertical incisions skilfully made with a knife close together round the whole circumference of the trunk, from the root to the branches. A few hours after this operation, which is done about the middle of June, there issues from the incisions a resinous, transparent, aromatic substance, which soon solidifies. After fifteen or twenty days this resin is collected in little baskets, lined with white paper or clean cotton cloths. Previous to this time the ground underneath the tree is covered so as to prevent the juice, which runs plentifully, from being soiled by the earth. If such contamination does take place, care is taken to cleanse it directly it is collected. The production of resin, which is collected by women and children, lasts about six months, and is valued at about £8 to £10 for a full-grown tree.

The mastic that exudes spontaneously is divided into two kinds,—the *kadisto*, which averages in value 100 Turkish piastres, the oke of 1200 grammes, and the *phliskari*, which has nearly the same value. That which drops from the incisions and is picked up from the ground is the *pectta*, worth 80 piastres the oke; whilst the worst quality, that which is mixed with earth, called *phluda*, is only worth from 40 to 60 piastres.

The annual production is about 2,000,000 drachms, and is attributed, by the natives of Chios, to the intervention of Saint Isidore, martyred in that island in the third century; the drops of blood of that martyr having given birth, they say, to the mastic tree.

In the East mastic is employed to strengthen the gums and to perfume the breath. It is at present little used in medicine, but principally in the arts, in the preparation of varnish.

A turpentine which has enjoyed a great reputation is also obtained at Chios, from the *Pistacia Terebinthus*, by means of more or less deep incisions in the trunks of the larger trees.—*Journal de Pharmacie et de Chimie.*

THE INFLUENCE OF SUNLIGHT ON PETROLEUM OILS.

BY M. GROTOWSKY.

In some recent experiments made by M. Grotowsky, he has shown that when petroleum oils are exposed, under certain conditions, to sunlight, they absorb oxygen from the air, which is converted into ozone, a phenomenon that has already been observed in some other hydrocarbons. No chemical combination takes place between the oil and the ozone, but the latter remains free, and oxidizes strongly any substance with which it comes in contact.

In oils containing ozone the smell is completely modified; they burn with difficulty, and attack rapidly the stoppers of the vessels containing them, especially if the stoppers be of cork. When glass vessels are used, it has been found that the colour of the glass exercises a great influence over the absorption of oxygen. Decolorized oils, exposed in white glass vessels to the action of sunlight, turn yellow, become charged strongly with ozone, and burn with difficulty. This is principally the case with the American petroleums. They should therefore be kept in metallic vessels, or if glass be used, it should be shaded as much as possible from the sun.

ACONITINE.

MM. Gréhant and Duquesnel recently presented to the French Academy of Sciences a memoir on aconitine, which M. Duquesnel has succeeded in extracting from *Aconitum Napellus* in the form of rhombic or hexagonal plates. The alkaloid is the active principle of this plant. In order to obtain it, the author extracted the root of the *Aconitum* by concentrated alcohol, with the addition of 1 per cent. of tartaric acid; the excess of alcohol was then removed by distillation, and the residue diluted with water in order to precipitate the fatty and resinous matters. The aqueous solution of tartrate of aconitine was then treated with an alkaline bicarbonate in order to set the alkaloid at liberty, this latter being scarcely very slightly soluble in water. It dissolves in ether, which, on evaporation, leaves it in the crystalline condition. M. Duquesnel assigns to it the formula $C_{54}H_{40}NO_2$. Aconitine is very slightly soluble in water, very soluble in alcohol, ether, benzine and chloroform. It is not volatile, and commences to decompose about 130° C. Its reaction is feebly alkaline. It combines with acids to form crystallizable salts; the author cites the acetate as presenting abundant crystals. Phosphoric acid, tannine, potassium iodide and iodate, and the double mercury and potassium iodate, produce the ordinary reactions on organic alkaloids. Aconitine is a powerful poison, its physiological action being analogous to that of curari, destroying the motor power of the nerves, but leaving the power of producing reflex actions untouched, at least in small doses.—*Revue Scientifique.*

Maquey.—This plant, more commonly called the hemp aloe, is found in most parts of the Philippine Islands. The natives obtain the fibre from it by cutting the thorns off and scraping the leaves on a block of wood with a shell until the pulpy matter is cleared away; the fibre is then hung up in the sun to dry. Another method is to beat out the leaves with a mallet and steep them in water for five days, the fibre is then easily obtained. This plan is much easier than the first, but the quality of filament produced is somewhat inferior. Very fine textures were at one time made from the fibre of the maquey, but it is now chiefly used by the natives for fishing purposes. The maquey fibre, after being steeped in a mixture of blood and lime, is said to be impervious to water.—*Consul's Report.*

The Pharmaceutical Journal.

SATURDAY, SEPTEMBER 16, 1871.

Communications for this Journal, and books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*
Instructions from Members and Associates respecting the transmission of the Journal should be sent to ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*
Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

CULTIVATION OF IPECACUANHA IN INDIA.

IT will be in the recollection of many of our readers that we have on several occasions referred to this subject,* and that last February we published an abstract of a lecture delivered by Prof. BALFOUR to the pharmaceutists of Edinburgh, in which he gave an account of what steps had been taken for introducing the cultivation of ipecacuanha in India.

It is scarcely necessary to insist upon the importance of this attempt, should it prove successful, and it is with especial pleasure therefore that we have been enabled through the kindness of Professor BALFOUR to communicate the very hopeful report that has been forwarded from India on the safe arrival of the plants. The following letter from Mr. WALTON (who took charge of the plants) to Professor BALFOUR has been forwarded through Mr. JOHN MACKAY:—

"*Bombay*, 31*st July*, 1871.

"Dear Sir,—According to promise I write to say that your case of ipecacuanha plants has reached Calcutta safely; much of this is due to the admirable packing. I never saw plants so well packed for a long voyage. Dr. King writes to me from Calcutta as follows:—'You will be glad to hear that the plants are in excellent condition. In fact I never saw plants arrive in a better state of health.' These plants will now have all the rainy season as well as the cold, to gather vigour for next hot weather, and I am now more than ever convinced that June or July is (with careful personal superintendence the whole way) the proper time to dispatch cases of plants (of most kinds) to India. We had trying weather too in the Red Sea. The thermometer registered as high as 108° repeatedly. I trust you may succeed with future cases. We ought to have some for trial in the Bombay presidency.

"I am, dear Sir, yours truly,
"(Signed) W. WALTON."

"J. W. BALFOUR, Esq., M.D.
"Professor of Botany, Edinburgh.

It will be seen from this letter that the arrangements, so far as they have gone, have proved satisfactory, and we learn that there are at this moment about 100 plants in the Edinburgh Botanical Garden ready for transmission to India when required. If this attempt be successfully carried through, our Government will have had the satisfaction of having introduced into India two most important pharmaceutical plants, cinchona and ipecacuanha, and as regards the latter, we shall be greatly indebted to Professor BALFOUR for the part he has taken in providing the plants.

* PHARM. JOURN. 3rd series, Vol. I. No. 5, p. 170.

HYDRAULIC TINCTURE PRESSES.

SOME months ago* reference was made to the use of hydraulic presses for tinctures and the advantages of using them were pointed out. We are gratified at finding that in consequence of the attention thus directed to the subject Messrs. HAYWARD TYLER and Co. have been endeavouring to provide a suitable hydraulic press for the use of pharmacists, and we are informed that they will shortly introduce it. We are also promised a description of this press, which we shall have much pleasure in placing before our readers.

ELEGANT PHARMACY.

THE publication in another column of the formulary issued by the Newark Pharmaceutical Association is an evidence of the greatly increased demand for the class of preparations therein referred to in the United States, where the proprietary medicine system has developed to an extent far exceeding that of this country, and has more than once occasioned attempts for legislative regulation. The desire on the part of pharmacists of presenting to the patient bitter and nauseous drugs in a pleasing and palatable form has given rise to the production of a multitude of preparations, as mentioned by Mr. HOWDEN, in his interesting remarks on Pharmacy in America, at an evening meeting of the Society during the last session. In fact, this business has grown to such an extent that we are informed it is sometimes necessary to keep, for dispensing purposes, half-a-dozen preparations bearing the same name, but emanating from different makers. This is due to the practice of certain physicians and apothecaries who patronize and prescribe the productions of particular pharmacists, a custom somewhat similar in effect to one met with occasionally in this country, to which attention has before been drawn in the pages of this Journal.

To counteract this evil the Newark Pharmaceutical Association has issued its formulary, while the Maryland College has proposed to treat these compounds as nostrums,—the mode of preparation of which is withheld, or, if published, yields a different article,—and to refuse to dispense them unless made by formulæ approved by the College.

Another side of the question is alluded to by the *American Journal of Pharmacy*, which says that

* See PHARM. JOURN. 3rd series, No. 17, p. 321.

some of these preparations are so destitute of medicinal properties, but are so agreeable to the taste, that they may be taken until, gradually, through the alcohol they contain, they create an appetite for alcoholic stimulants. This doubtless would be a disadvantage outweighing by far any benefit accruing from the pleasing appearance and the agreeable taste.

We find it stated, in a recent number of *Galignani's Messenger*, that the Mayor of the 1st arrondissement of Paris, on a report of the Comité des Ambulances, has conferred on Mr. Swift, English chemist, of the Place Vendôme, a medal of honour, for his energetic services during the first siege of Paris. This mark of high satisfaction was accompanied by a diploma, declaring that the recipient's exceptional devotedness and attention had entitled him to the gratitude of the French people.

Our newspapers and magazine covers are so overladen now-a-days with announcements and testimonials of wonderful cures and extraordinary effects of some quack nostrum with a long name, but about the composition of which we are supposed to know nothing, that it really would be a relief if we could have plain old Gerard back amongst us again, turning almost our entire British flora into a medical garden. The leaves of *Polygonatum multiflorum* appear to have been in his time most efficacious in removing the marks of bruises, for, beaten into a paste, and applied to the injured part, they were said to remove all external appearances, and to cure, as Gerard himself says, "any bruise, blacke or blue spotts gotten by falls or woman's wilfulnesse in stumbling on their hastie husband's fists, or such like."

The island of Nissiros, one of the Sporades, in the Grecian Archipelago, is of volcanic formation, the centre of it consisting of the crater of a large extinct volcano, so much impregnated with sulphur that cultivation is impossible. This sulphurous substance appears to be encroaching yearly on the arable land. A few years since, the Ottoman government established a manufactory for refining the sulphur found in the crater of the volcano, but hitherto little has been produced. If this establishment were worked on a large scale, it would afford a considerable amount of employment to the inhabitants; but some Nissiriotes who had been engaged in the work, having all of them died within a short time, the natives are unwilling to engage themselves in the labour for fear of a similar fate.

Provincial Transactions.

BRISTOL PHARMACEUTICAL ASSOCIATION.

SCHOOL OF PHARMACY.

Session 1871–2.

The Council has the pleasure to announce having made arrangements by which it is enabled to offer to fellow-members and associates the following complete course of instruction in chemistry, botany and materia medica.

A course of thirty lectures by Mr. Coomber, F.C.S., on Elementary Inorganic Chemistry, every Tuesday, at 7.30 p.m., commencing in October.

A course of thirty lectures by Mr. Coomber, F.C.S., on Elementary Organic Chemistry, every Tuesday, at 8.15 p.m., commencing in October.

A course of sixty lectures by Mr. Leipner, on Botany, Physiological, Economic and Systematic, every Monday, at 7.30 p.m., commencing September 18th.

At the conclusion of this series, that is in May next, an examination will be held in each subject, at which each student is required to present himself.

Tickets for the entire series will be five shillings for members and associates, provided the holder complies with the condition of presenting himself for examination, and shall have attended not less than twenty-five lectures in each course, in accordance with the regulations of the classes, if not, the fee will be ten shillings. The ticket will admit to either one, or the whole of the above series, but students are earnestly advised to abstain from entering for more courses than they can reasonably expect to follow up.

As the botanical lectures commence on Monday, the 18th, it is hoped that every principal will at once acquaint the assistants and apprentices of his establishment with the facilities offered for their scientific culture, and will do his best to further the efforts of the Council, some member of which will shortly call for an answer to this application.

Tickets for the above lectures may be obtained of the following gentlemen:—Mr. Stoddart, North Street; Mr. Schacht, Clifton; Mr. Pitman, Redcliff Hill; Mr. Taplin, Corn Street; Mr. Martin, Redland; Mr. Stroud, Wine Street; Mr. Townsend, Union Street; who will be happy to give any further information which may be desired.

Through the kind offer of the late President, Mr. Stoddart, the Council is also able to announce a series of about twenty-five lessons on the chemistry, botany and materia medica of the Pharmacopœia, adapted to the requirements of those associates of the Society who are preparing for the examinations at Bloomsbury Square. Mr. Stoddart declines to accept any payment for his labours, but agrees with the rest of the Council in the propriety of charging a fee of £1. 1*s.* for attendance at these lessons, the proceeds being arranged to go to the formation of a fund to meet the expenses of a pharmaceutical museum, or some similar educational object. The lessons will be every Tuesday and Thursday evening, commencing September 19th.

Tickets for this course to be obtained only at Mr. Stoddart's, North Street.

Mr. Coomber is also prepared to offer a course of practical laboratory instruction on Friday evenings at the laboratory in Nelson Street.

The fee for this instruction is £1. 1*s.* per quarter, and the tickets are to be obtained of Mr. Coomber only.

G. F. Schacht, *Hon. Sec.*

Proceedings of Scientific Societies.

BRITISH PHARMACEUTICAL CONFERENCE.

Tuesday Afternoon, August 1.

Mr. D. HANBURY read a paper on

WILD RUE OR HARMAL SEEDS (*Semen Harmalæ*).

BY DR. F. A. FLÜCKIGER,

Professor of Pharmacy and Pharmacognosy in the University of Bern.

One of the plants named in the Non-officinal List of the *Pharmacopœia of India* is *Peganum Harmala* Linn., the seeds of which have long held a place in eastern medicine, and are an article of the Materia Medica respecting which Dr. Waring the author of the pharmacopœia in question, remarks that further investigation is desirable.

Although the following notes do not tend much to elucidate the therapeutical properties of this drug, regarding which information is most wanted, they may not be without some value as a contribution to its pharmacological history.

For convenience of reference, I have arranged my remarks under distinct heads.

Botanical Origin.—*Peganum Harmala* Linn., belongs to the Order *Rutaceæ*. It is a strong-smelling, herbaceous plant from 1 to 3 feet high, found wild in Southern Europe, Asia Minor, Egypt, Arabia, North Western India, and Southern Siberia.

History.—The plant is the Πήγανον ἄγριον (Wild Rue) of Dioscorides, Πήγανον being the name still applied in Greece to several species of *Ruta*. The seeds were used medicinally by the ancient Greeks as they are to this day in India, where they are chiefly known by the old Arabic name of *Harmal*. In Europe they were formerly much employed as *Semen Rutæ silvestris*, and as such are enumerated among the simples of several of the early London pharmacopœias.

Description.—The seeds are of a dark brown, 1¼ lines in length and ½ to 1 line in diameter, variable in form, but usually conical or with a semilunar or crescent-shaped outline, always angular, and rugose on the surface. They have an aromatic taste resembling rue, with some bitterness.

Microscopic Structure.—The testa is built up of two distinct layers, the outer forming a spongy tissue which consists of large, thick-walled cells. The cells of the inner layer are of a somewhat cubic form showing a peculiar, undulated outline. The albumen exhibits the usual thick-walled cells, the embryo consisting of a more delicate tissue. These cells contain chiefly albuminous matters, fat and essential oil.

Chemical Composition.—The most interesting fact concerning these seeds which immediately claims attention, is the magnificent green fluorescence which they impart to alcohol of about 75 per cent.* This optical power is partly due to a substance called *Harmin*, and partly, it would appear, to the formation of a peculiar colouring matter named *Harmala-Red* which has not yet been fully examined but which does not pre-exist in the fresh seed.

Fritzsche has showed that the seeds yield 2 to 3 per cent. of an alkaloid termed *Harmalin*, which is contained in the outer coat or testa. It is obtainable in colourless crystals, sparingly soluble in water or in ether, but more readily in alcohol, the solutions being of a bitter taste. Its composition is indicated by the formula $C_{13}H_{14}N_2O$.†

By heating the bichromate of harmalin, another alkaloid, *Harmin* ($C_{13}H_{12}N_2O$) is produced, of which about 1⅓ per cent. may also be obtained directly from the seeds. Harmin forms colourless crystals and colourless or slightly yellow salts. The alcoholic solutions of these compounds exhibit, when dilute, a blue fluorescence.

Further details respecting these alkaloids, condensed from Fritzsche's original papers, may be found in Gmelin's *Handbook of Chemistry*,* as well as in Husemann's *Pflanzenstoffe*.†

Uses.—In the East, stimulant, anthelmintic and even narcotic virtues have long been attributed to harmal seeds, but accurate observations respecting their medicinal powers are still required.

In Southern Russia a red dye, asserted to be both brilliant and permanent, is extracted from them. Finally they have been grown as an oil-seed.

* It may be observed even with a single seed.
† C = 12, O = 16.

* Vol. xvi. (1864) 103. † Berlin, 1870, page 76.

Dr. ATTFIELD read a paper on

A METHOD OF OBTAINING DISTILLED WATER ECONOMICALLY.

BY C. A. STAPLES.

Very few words need be said about the value and importance of distilled water. I do not write a treatise to prove a fact patent to every chemist, but knowing the great inconvenience many experience where they are not in a position to obtain a supply of it promptly, I wish to point out to them an easy and inexpensive arrangement by which an abundance is brought within the reach of every householder, viz., by the very simple expedient of converting the kitchen boiler into a still.

I first tried the experiment about twelve years ago in the simplest manner, not knowing what difficulties or even danger I might experience from its use, but I have found none. A few improvements have since been added, and I now purpose describing the whole plan for the benefit of all who may adopt it.

The boiler is a small cast-iron one, such as is usually supplied with the kitchen range for a small private family; it is self-filling by a small cistern and ball-cock in the usual manner. This cistern having cold water constantly flowing through it, I thought that it would act as a condenser, and it will be so called in the following description.

The lid of the boiler is closed by a paste of castor oil and whiting, which does not harden. The top plate has a hole drilled in it at the back corner near the wall, into which a piece of stout brass tube,‡ about nine or ten inches long, is fixed. To the top of this a piece of half-inch tube of *pure tin*§ is fitted, bent to an angle of about 60° or 65°, which, passing through a hole in the brickwork at a regular fall of about 25° or 30°, projects a few inches beyond the other side of the wall, where the end, slightly contracted by a file and curving downwards, is received into the enlarged mouth of a similar piece of tube, into which it fits sufficiently firmly without any joint or cement. It then enters the condenser near the top, is curved half round the inside out of the way of the ball, and passes out at the centre of the bottom, being secured to the condenser by screw joints; that at the top may be an ordinary brass one, but the lower one should be cast in pure tin, or if a brass one is used, it must be carefully tinned inside and out, for although not in immediate contact with the distilled water, a slight moisture might collect on it and injure the water.

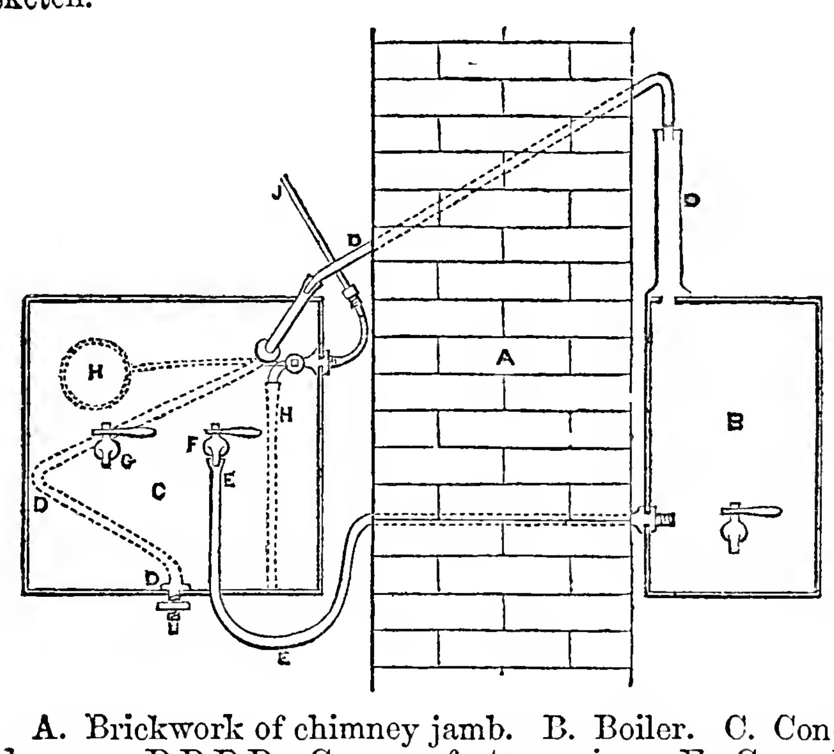
The lower end of the pipe should be tied over with muslin, or closed and pierced with fine holes, since insects, attracted by the warmth and moisture, might enter it in the night. In fact, the greatest care must be taken to ensure the purity of the metal, and that the inside of the pipe, from the point of condensation, is protected from any metallic or other contamination. The condenser should be much larger than usual, and have a lid

‡ Any piece of tube will do. Mine is a piece of a gas pillar, such as is screwed into a counter.

§ For a very large boiler a ¾ or even 1-inch pipe might be required, and the boiler should be made of wrought iron.

fitting *inside*, or steam will collect on it and flow down the outside of the condenser. It should stand on a stool with a hole for the pipe to pass through, under which the jar to receive the distilled water could be placed out of the way. The ball-cock should have a piece of pipe soldered to the nozzle, that the cold water may reach the bottom of the condenser. The pipe for feeding the boiler should come from about the centre of the condenser and curve downwards, so that a portion may be below the bottom of the boiler; for without this precaution the heated water would circulate to and from the condenser, and the water would soon become nearly as hot as that in the boiler itself. This simple precaution effectually prevents it, as the heated water will not pass through the cold part of the pipe below it without pressure. It should also be furnished with a stop-cock; all the joints should be secured by a few disks of stout brown paper over the flange, which, when drawn tight by the nut, effectually prevent leakage, and are easily removed if required for alteration, repair or cleansing. But if they are fixed with lead cement, they become so firm that they cannot be removed without injury. The condenser should have a waste pipe, unless the main cistern has a stop-cock to shut off the whole supply at night, or the condenser may overflow, since the ball-cock must necessarily work easily, and a slight leakage might be expected. The hole in the brickwork should have a piece of iron pipe cemented into it, to form a regular slope for the steam pipe, as it might drop into the hollow space and water collect in it.

I found the experiment very successful, the supply of distilled water being abundant and pure enough for any purpose. It is perfectly self-acting, the boiler fills itself and the water distils itself. It does not cause any inconvenience, interfere with any domestic or culinary operation, or limit the use of the boiler; on the contrary, it is greatly increased, as an abundant supply of heated water may be drawn from the condenser, care being taken to close the stop-cock and keep it closed for ten or fifteen minutes, or until the heated water is replaced by cold. It is perfectly safe, as the steam escapes freely through the tube, and the lid of the boiler, although steam-tight, may be raised with the thumb and finger. Little attention is required beyond placing a vessel to receive the distilled water and seeing that it does not overflow; the supply being so copious that sometimes, while cooking a dinner for a moderate family, several gallons will come over. I have found it difficult to give a perspective view of the apparatus, as some part must be concealed by the projecting brickwork, but hope it may be sufficiently understood by this partly sectional sketch.



A. Brickwork of chimney jamb. B. Boiler. C. Condenser. D D D D. Course of steam-pipe. E. Curved tube for feeding the boiler. F. Stop-cock screwed to condenser. G. Cock for drawing heated water from condenser. H H. Ball-cock, with tube for cold water to reach the bottom of condenser. J. Pipe communicating with main cistern. This pipe need not be large, as the water will never flow much larger than a goose-quill. Mine is only $\frac{1}{4}$-inch, but for a very large boiler I should think one $\frac{3}{8}$th of an inch would be ample.

Mr. Savage pointed out one or two objections to the method.

Mr. Baildon said that fifteen years ago he had occasion to fit up a small range. This range at one side had a high-pressure boiler, and he got inserted a valve that should be shut or left open. When open, the steam entered almost immediately, and from that day to this he had not had difficulty in getting distilled water.

Mr. Bottle said that this was a similar application to that which he used twenty-five years ago.

Mr. Williams stated that one thing in connection with this was, that the excise insisted on their paying still-licence for the right to distil water.

Mr. Baildon remarked that it was ascertained some time ago that that was not the case.

Mr. Williams said that he thought Mr. Baildon must have been misinformed.

Mr. Baildon stated that he had discontinued taking out a licence for many years.

A Member asked whether it was because Mr. Baildon had a steam engine, so that he could get distilled water from it, that he escaped the excise? If he had a still, he would have to pay for it.

Mr. Baildon said that he had not a still.

Dr. Attfield: Then the Excise allow you to distil because you have not a still on the premises?

A Member: Mr. Baildon has a steam-engine.

Dr. Attfield: Then the position is this:—you may have a still if you call it a steam-engine.

Mr. Mackay said he thought that if the plan proposed by Mr. Baildon were adopted, and if it became known to the Excise, the chemists would have to pay 10*s*. 6*d*.

Dr. Paul stated that he had been in communication with the Excise authorities on the subject, and, in answer to whether the chemists might use a still for distilling water, was told that, although the Inland Revenue had power to grant exemption from the provisions of the Act as to licences, there was such extreme difficulty in drawing the line between cases subject to payment of duty, and cases which might be exempted from it, that they were often at a loss what action to take, and found it practically necessary to insist on the payment of licences from every one who had a still, that was, a vessel capable of the distillation of alcohol. Although there was a willingness to remit the licence when it was objectionable, they found it impossible to do so. Some years ago he was engaged in a manufacture where distillation was carried on. They had several stills, for all of which they had to pay licence, and it was a somewhat serious tax. He applied to the Income-tax Commissioners, and requested them to allow him to use the stills without a licence. In that case they did give permission, but the material distilled was tar. He had some difficulty in making them understand that it could not be used for the distillation of alcohol, but so soon as they were satisfied of that they granted his request; and he believed that they would do the same in other cases if they were satisfied that it was for such purpose.

Microscopes and Photographs.

Dr. Edwards exhibited a number of excellent microscopes and beautiful photographs. The photographs represented the old and present laboratories of the Society and portraits of some of the founders of the Conference. The microscopes were remarkable both for cheapness and superior quality.

The next paper was one on—

Pharmaceutical Ethics.—*Re* "Apprenticeship."

BY S. R. ATKINS.

We venture to claim for the subject now introduced to your notice the merit, at least, of practical importance.

It is evident, on a moment's reflection, that the future of pharmacy is vested in the hands of our young men.

We are all alike interested,—the trainer, the trained, and the public on whom we depend. The present generation of principals were in their day pupils, whilst the pupils of to-day will, in their turn, be teachers. But apart from the abstract or general merits of the question, there are special and particular aspects of it at the present moment which deserve our careful consideration.

Let us inquire what *Apprenticeship* means. It is an arrangement through which a youth is placed by his parents or guardians under the care of a third person to learn a profession or trade, the remuneration for which education is called "the premium."

It is relevant here to inquire if this system be a good one and desirable to be continued, for we scarcely need remind the readers of 'The Year Book,' and of the interesting article it contains on American pharmacy, that the *institution* of apprenticeship, as our Transatlantic Cousins would term it, does not exist amongst themselves. We are disposed to answer this question affirmatively, but, at the same time, endeavour to show what modifications are needed.

We venture on this subject with some degree of diffidence, remembering how ably and comprehensively the entire field of pharmaceutical ethics has been surveyed by Mr. Ince, a name, by the bye, worthy of the highest respect by all pharmacists; we refer more particularly to the elaborate paper read at the Nottingham meeting.

It is with great satisfaction we also recognize the ably expressed opinions on this and kindred branches of the same subject of Messrs. Giles, Schacht, Brady, Benger and others.

On the other hand, the question is by no means as yet threshed out; indeed, it is doubtful if it has yet been fairly grappled with, whilst the difficulties inherent must, from the nature of things, increase for a time at least. A statement of the facts in the first place, and of suggestions remedial in the second place, will probably be the best plan on the present occasion.

1st. For the facts.

Fewer apprentices are being taken. Of these it is to be feared comparatively a small proportion are being trained in establishments competent for the task. The results are evident in the Preliminary Examination. Those who, like myself, are familiar with the facts of provincial education, know that the failure of our youth in that initial test scatters dismay amongst their own ranks and that of their friends. The standard of that Examination it would not be wise to lower; if that be done, the subsequent or higher rungs of the ladder must be reduced in proportion. To say the least, such a course would be an anachronism in an age of growing culture in the nation generally; and when from ourselves special demands are made, as the result of that chartered status, so long nobly fought for, and at length secured. Our classic houses both in town and country have not yet felt the pressure, but that the inexorable logic of facts they will sooner or later have to acknowledge there can be no doubt; the supply of young men is not keeping pace with the demand. Many personal friends of mine are declining the responsibility of taking apprentices. Men competent for the work say, "We have done our share in this matter, and will now leave it to others." The result is, our youths are being relegated to third-rate houses, in which "the premium" is the "consideration" in more senses than one, where the habit of industry may be acquired, and the charms of variety are freely offered, but where chemistry and pharmacy are conspicuous only for their absence.

Such, in brief, are the facts of the case. And now what remedial measures can be suggested? for we all know how much easier it is to criticize than construct, to analyse than to synthesize.

We start then from the position that the ordinance of apprenticeship is in itself sound and good. What can be done to bring it into more harmonious working with the other gear of pharmaceutical machinery? Confessedly the difficulty is for the transition period of the next few years. That the thing will come right in the end there can be no doubt.

Firstly, we insist on the Preliminary Examination or its equivalent, one of the University Local Examinations, being passed as a prerequisite of apprenticeship.

The advantages thus secured would be immense, and felt at each subsequent stage. An eligible start would have been secured for the youth, whilst the master is placed in a less invidious position. A lad submitting to the test immediately on leaving school should be in "form" to win the race; whilst for ourselves, as men of business, we are conscious of the fact, whatever our capabilities may have been when school-days ended, and we had our first introduction to the pestle and mortar, that at any rate *now* we cannot accept the responsibility of teaching Ovid or Euclid.

We urge then a liberal and prolonged school-training, to be continued at least until sixteen years of age; this will necessitate the ranks of pharmacists being recruited from the substantial section of the middle class; *pari passu*, this will be a gain, for whilst we gladly acknowledge the fact that intellectual force as well as moral quality is not confined to any rank of society, there clearly would be less disappointment if those who joined our order were more equally weighted, not only at starting in educational advantages, but in pecuniary prospects; we might then hope to see a diminution of those wretchedly small businesses, the cause of much more heart-breaking than is indicated in the *Gazette*, or the lists of our Benevolent Society.

The next point to which we advert is the *shortening the term of apprenticeship*. Three years, or at most four, will be regarded as sufficient. The contraction of the time must prove a mutual benefit: less to be played with, concentration of energies will be aimed at and achieved.

An improved treatment of our apprentices will inevitably arise as the result of mutual confidence and respect. At its best estate, and under the most favourable circumstances, the pursuit of pharmacy has many drawbacks, but what it must be when these conditions are wanting, it is sad to think,—long hours, short holidays, much work and sometimes dirty too; this is, alas! too often the plain prose which destroys all the early romance of coloured carboys and mirrored glass.

Let us not be misconstrued; we have no contention with work, and plenty of it too. The best men in any calling are those who have attacked its initial drudgery with brave hearts and strong arms, having faith in the law that no lasting or proportioned structure can be reared on an imperfect foundation. Only let us as principals see to it, that the conditions under which that work is done are not too exacting.

We advance to the last consideration and the most important. What are the just claims our apprentices have on us for instruction, and to what extent are those claims at present being met?

By the deed of indenture we undertake not only to provide sufficient and suitable board and lodging, but we also covenant to teach the art and mystery of pharmacy. Let us fairly look this matter in the face; where do our responsibilities begin, and where do they end? We assume the Preliminary Examination, or its equivalent, has been passed; this, as we have already argued, must be insisted on, as a *sine quâ non*.

A youth of sixteen enters an establishment with this credential in his hand that he has received a liberal and classical education. Here then we start, and the goal at the end of the course is the Minor Examination of the Pharmaceutical Society. To enable a young man to acquit himself satisfactorily at that ordeal should be our aim; and in making this statement, we take it for granted the other qualifications which go to make a first-class business-man are not overlooked, namely, method, order, punctuality, address, etc.

In the closing remarks of this paper, we desire to avoid everything savouring of uncharitableness towards a body of men deserving the highest respect; we refer to the great body of our provincial brethren. These men are for the most part conducting their businesses with credit and success, but, not having possessed in their early days the advantages now so readily procurable, they are willing to confess their inability to impart the requisite knowledge with which to approach the 'Minor.'

What is the remedy for this state of affairs?

Bloomsbury Square is not available in the provinces; local schools are few and far between; in fact, they are wellnigh out of our calculation; invaluable as centres of light, where their influence is felt, they but make the darkness beyond more visible. That something at once must and ought to be done, the large proportion of rejected candidates at our examinations painfully attests.

We have attempted the diagnosis of the disease, and ask the remedy; as a humble contribution to the same, we suggest that wherever there are some half-dozen young men in a town needing and seeking instruction in pharmacy, that is, the general course of reading suggested by the Minor Examination, they club together, during the winter months engage a room, and respectfully solicit the direction of the most able pharmacist in the place to guide their studies. Further, that the Council of the Pharmaceutical Society foster provincial education with their recognition and *active* sympathy; that competent men in country towns be urged to undertake this work, that class books be suggested, small cases of apparatus for the study of analysis be granted on loan, and the results of such labours find their recognition in the pages of the PHARMACEUTICAL JOURNAL.

Salisbury, July 5, 1871.

The CHAIRMAN said this was a subject on which the whole afternoon would hardly be long enough to hear those most capable of giving an opinion. Instead of entering into the subject himself, he would rather hear the opinion of others, such as his friend Mr. Deane. With regard to the question of education, he might remark that the questions now put to their apprentices were so easy that he would be surprised if a lad could not answer them. It had been stated as an objection, that if they gave the lads so much time for learning as some desired, they would not do enough of work. If they gave them a proper amount of study with their proper amount of business, he thought they ought to see that they did their work. He himself was apprenticed in a locality in which he was made to do drudgery, but which, he was thankful to say, he was obliged to learn. In his time of day they had no holidays. He began at half-past six o'clock in the morning, and left off at eleven at night. These were the hours, and he had no holidays, Sunday or Saturday. When he went to Bath he was astonished when his master offered him a fortnight's holidays. His own young men had an hour in the morning to themselves, and he had a good deal more work done than if he did not let them out. He recollected when he was ordered to do a great many things which lads nowadays would consider beneath them, and would not do. The force of example went a good deal further than anything he could tell them. One of his young men had seen him night after night at the microscope, and this young man might at first have thought that he was a very stupid fellow; but by-and-by he came to take an interest in the matter, and became as good a microscopist as there was in England. A good deal depended on the way in which they treated their young men. If they told them they must do such-and-such a thing, they would not enter into it with the same heart as if they had been persuaded to do it. He thought the paper was one of very great importance.

Mr. DEANE said his experience was much the same as that of Mr. Stoddart; but he considered that the altered conditions of the times rendered the responsibility of taking apprentices much greater than it was thirty or forty years since.

Mr. SCHACHT said the subject immediately before the meeting was one he felt scarcely competent to speak about. It was this conviction that had hitherto kept him silent upon this one section of the subject he had so much at heart, pharmaceutical education. He candidly admitted he did not know how to meet it, it was beset with so many difficulties. In the first place a master, merely because he was a pharmacist, was expected to possess that great and special gift, the ability to guide and direct the moral training of a youth at the most critical period of his whole life. To add to his difficulty, it might be quite possible that two entirely opposite characters became his charges at the same time. It was also expected of him, not only that he should be a good pharmacist, but also that he should possess the qualities of a good schoolmaster, and that, contrary to general experience, he should be as well able to teach as to learn. These were some of the difficulties of the case, and the only solution that suggested itself consisted in the separation of some of these duties. If instead of it being the habit and rule that masters should receive youths into their houses as well as receive them into their businesses, an arrangement could be made whereby the youths' boarding and lodging could be done elsewhere, one great difficulty would be removed, and the master would be absolved from the charge of the moral training of his apprentices; and then it might be possible that some of the best houses who now, because of their disinclination to accept this charge, decline to take apprentices, would willingly offer their excellent professional opportunities. Again, as to the best method by which an apprentice could gain the scientific knowledge requisite to make him a good pharmacist, it seemed to him better that he should look for this outside his master's shop. It appeared almost too much to expect that the same man should be at once a good retail trader and an instructor in chemistry and botany. He did not mean that he could not help his pupil, but that he could scarcely be expected systematically to teach science; and all desultory work might as well be left alone. Would it not be better that during the time the apprentice was fulfilling his duties in the shop, certain portions of the day should be devoted to attending professional lectures, and some encouraging help given him in appropriating what he there heard? Speaking collectively, he thought the direction of their efforts should be to develope such a system of scientific education, away from the shop, as to make it unnecessary for the master to undertake that duty himself. The establishment of provincial centres with such classes as portions of their system was, he thought, the best means to this end; and he was glad to find the observations of previous speakers tend so distinctly in that direction.

Mr. MACKAY (Edinburgh) said that Mr. Schacht had referred to what occurred to the minds of the pharmacists in Scotland, as a very strange mode of procedure in binding apprentices throughout England. He wished to bring before the meeting the fact that in the whole of Scotland, as far as he was aware,—and he knew the arrangements of the pharmacists throughout the country very well,—he did not think there was a single case where a premium was paid and where a youth was boarded and taught his business. The very reverse was the case; and his object was to impress on the

Conference, that the system which Scotland had adopted had not only been longer in existence, but had worked so admirably that he felt sure their friends in the South would be going in the right direction if they were to take a leaf from their book. Some years ago, before the Preliminary Examination was adopted, it was arranged that no youth should be taken by any chemist or druggist—at all events by no Member of the Pharmaceutical Society—unless his parents or guardians agreed to pay fees for his attendance on certain classes; the master, on the other hand, becoming bound to furnish him time for attending these classes. The system followed and still pursued was this. A fairly educated youth about to be apprenticed to a druggist was told, not that the period was to be three or four, but five years. The exceptional cases of three or four years arose generally from a lad being pretty far advanced—say seventeen or eighteen years old,—in which case it was no uncommon thing to shorten the period. Five years might therefore be considered the usual term. Now, during these five years the lad was not kept by his master, but received a salary of £10 per annum. The lad thus apprenticed went to the business as a rule at 9 A.M., but if he had opened the shop at an earlier hour, he then got permission to go home to breakfast for a suitable time. Those who came with their breakfast got an hour and a half for dinner, and if this was early in the forenoon, then a few minutes were allowed in the afternoon for the apprentice to get refreshments. Such a plan had existed and worked in the most satisfactory manner for a very lengthened period. He might say, however, in regard to the Preliminary Examination, that he thought it now well understood by the leading pharmacists throughout Scotland that in the case of a young man applying to become an apprentice, in addition to the master giving time, it had become the rule that that young man must pass the Preliminary examination. Nothing had been so satisfactory as the determination that no young man should now be allowed to enter the Pharmaceutical Society unless he had passed that examination. He said this all the more strongly, because he had kept a register for situations for young men for many years, thus obliging employers who might want assistants. The young men were required to write a letter, stating their capabilities and the kind of situation sought for; and he told them frankly that the letters they wrote would be shown to inquirers, they had therefore every opportunity to be careful in their style of writing, as well as in their grammar and orthography. The Conference would be astonished if they saw the letters now and again put into his hands by men who had served the regular apprenticeship of three, four or five years to druggists. Such a state of things must end. By exacting the Society's examinations, they prevented the possibility of young men being allowed to apply for situations for which they were incapable. Many of them did not know the mere ordinary rudiments of the English language. It was a state of things which ought not to exist, considering the position which pharmacy now occupies. He concluded by strongly recommending the Scotch system to the consideration of their English brethren.

Dr. Edwards said he was not able to say that Canada represented the advanced guard, but it had assumed a very similar position to that of Scotland in this matter. The term of apprenticeship did not generally exceed four years, and the salary ranged from £10 the first year, £20 the second, £30 the third, and £40 the fourth. Four years, he believed, was the ordinary term, but very frequently three years were considered sufficient; and, as in Scotland, the apprentices did not reside in the house. The principal often resided in the country, or in another part of the city from the place where his shop or store was situated. He had experienced some of the difficulties which Mr. Schacht had suggested with regard to the social relationships of apprentices. The want would be better met by the apprentices residing in such families as were acquainted with their parents, or in such circumstances as parents might think proper to place them. He thought an agreement was better than the old system of indentures, and he was surprised when he read over some of the restrictions, such as not playing cards, not being allowed to smoke, nor to go out of the house without the master's permission. These were things which were curious, and belonged to old habits and customs. It was important for the Conference to keep in view that they had to provide men for the future. They could not over-estimate the importance of this, looking to the demand there would be from foreign countries. One important point they should not lose sight of was a thorough knowledge of book-keeping; and in the matter of stock-taking, some chemists were very much at a loss indeed. These were matters to which it was important that attention should be directed.

Mr. Atkins said he remembered reading a paper by Mr. Giles in the Pharmaceutical Journal, in which he advocated some system of boarding out. He (Mr. Atkins) could not say he had brought his mind entirely to agree with Mr. Giles's proposal. He could see the very great advantage, but also the disadvantage, of the proposed system. He feared the difficulty pointed out by Mr. Schacht would be enhanced were that plan carried out. That was in regard to the moral training. As to the provinces, Mr. Mackay's system would suit admirably for Glasgow and Edinburgh, and towns where classes could be obtained, but in other places it would not do.

The following papers were taken as read, owing to want of time:—

The Preparation of Liquor Bismuthi.

BY C. H. WOOD, F.C.S.

For the last two years I have frequently resorted to a process for the preparation of a liquor bismuthi, which would, I think, constitute a good process for a future Pharmacopœia, because, while it is very simple and is easily performed, it yields a product quite free from nitrate of ammonia, and eliminates all the impurities of metallic bismuth.

To proceed by this method, I first obtain pure anhydrous oxide of bismuth. A weighed quantity of this oxide is then digested with a mixture of citrate of ammonia and citric acid in strong solution for fifteen or twenty minutes at near the boiling temperature, after which a slight excess of ammonia is added, and the solution diluted to the required volume. The mixture of citrate of ammonia and citric acid rapidly and completely converts the anhydrous oxide into citrate of bismuth, which the ammonia afterwards added instantly dissolves.

The oxide of bismuth is best prepared from the subnitrate of commerce. A pound of the subnitrate is boiled for a few minutes with four pints of liq. potassæ, then washed by decantation and dried in a stove or water-bath. It forms a dull lemon-yellow powder, which is anhydrous and perfectly definite in composition, being represented by the formula Bi_2O_3. 100 parts of the subnitrate yield from 81 to 82 of oxide.

Instead of boiling the basic nitrate with the potash, digestion in an earthenware jar with frequent stirring for an hour or two may be resorted to. Care should be taken to employ liq. potassæ free from carbonate. As the oxide subsides with great rapidity, it is perfectly washed with ease and quickness by decantation. I have always found commercial subnitrate of bismuth to be quite free from copper, and any traces of arsenic or antimony which it might contain would be completely removed by the potash; consequently the oxide of bismuth must necessarily be of great purity.

The following formula is adapted to the preparation of a gallon of liquor bismuthi, having the same strength as the solution of the Pharmacopœia:—

Oxide of Bismuth	9 oz.
Citric Acid	16 oz.
Strong Solution of Ammonia .	12 fl. oz. or q. s.
Water	q. s.

Dissolve 8 oz. of the citric acid in 4 oz. of hot water, and carefully neutralize it with some of the solution of ammonia (about 7 fl. oz.), mixed with half its volume of water. Then add the other 8 oz. of citric acid, and when it has dissolved introduce the oxide of bismuth. Heat the mixture to near its boiling-point for about fifteen minutes, with frequent stirring, then add about a pint of water and introduce sufficient ammonia to dissolve the insoluble portion, and render the liquid slightly alkaline. Augment the solution to the volume of one gallon, and filter through paper.

It will be found upon heating the mixture that the pale yellow colour of the oxide rapidly changes to a pure white, and at the same time the insoluble portion becomes more bulky. These signs indicate the conversion of the oxide into citrate of bismuth; the digestion is continued for a little time to ensure the perfect completion of this change. The ammonia, subsequently added, should effect a complete solution, leaving nothing insoluble but the dust, etc., inevitably present in the powder taken.

As the oxide of bismuth employed is quite as definite a substance as the metal itself, it follows that the resulting liquor will be as uniform in strength as if prepared according to the process of the Pharmacopœia.

The Proposed Changes in the Nomenclature of the Pharmacopœia.

BY C. R. C. TICHBORNE, F.C.S., M.R.I.A., ETC.

Professor Attfield has lately proposed that certain changes should be made in the nomenclature of the British Pharmacopœia; that the modern notation should be used only, and that the terms employed should coincide with that notation. Thus in the present Pharmacopœia two notations are employed but only one nomenclature, and the framers of that work gave preference to that notation which harmonized with the old system; this, however, is now nearly obsolete.

Professor Attfield's Manual of Chemistry has made such rapid progress in public estimation, that it may be considered to have almost become the medical and pharmaceutical text-book of chemistry.

Its reputation is not one iota in advance of its merits, and as the originator of such a work, Professor Attfield's words come with even more force than they otherwise would. The general tenor of his recommendation is to the effect that we should retain some part of what is known as the Lavoisierian mode of nomenclature, but substituting the metallic names throughout for the alkalies and alkaline earths.

Thus we should say sulphate of sodium, sulphate of iron, carbonate of magnesium, etc., instead of sulphate of soda, sulphate of iron or carbonate of magnesia. Also that we should discard the old atomic weights and use the new atomic weights alone.

With all this, I, as one humble worker in the field of science, heartily agree. Fourteen years ago I advocated these new-fangled ideas as they were then termed, and have consistently used them in practice. So little were such views entertained at that time, that with one exception, there was not another chemist in Dublin who even acknowledged the probable correctness of such a system. What a change has been wrought in these fourteen years! This was the system used by Aug. Hofmann when the writer was at the College of Chemistry, and it will perhaps be in the memory of some of the gentlemen present that exactly a similar system is used in his (Dr. Hofmann's) Report on the Exhibition of 1862. In speaking of this matter in the introduction to that work, he says, "The symbolic notation employed in this report requires a few words of explanation here, and perhaps also of justification. It differs from the notation still in use only by the doubling of the equivalents usually assigned to oxygen, carbon, sulphur and a few other elements. Slight, however, as this change is, it suffices to alter materially the aspect of many formulæ, and to those who still adhere to the old notation it may give a little trouble which the reporter would willingly have spared them. For this reason, indeed, he hesitated a good deal before deciding to employ the modified notation. To this decision, however, he was ultimately brought by the reflection that the modified notation is essentially necessary to represent with the requisite clearness and precision the vast and daily multiplying class of substitution changes, and that on this ground only, if on no other, the double equivalents must ere long come into universal use." The author then uses the terms carbonate of sodium, sulphate of ammonium, etc. Dr. Attfield wishes to substitute a similar system for the Pharmacopœia, such a system that whilst giving due prominence to all the most firmly established theories of modern chemistry, also does away with such inconsistencies as calling one salt the sulphate of the oxide, and another salt, exactly framed upon the same type, the sulphate of the metal. It enables us to view all these salts as constructed upon one given framework.

But outside this the system does not go; and when from time to time extreme terms are introduced to convey special or extreme theories, they should not be considered in any system intended for general instruction, but should be strictly confined to the writers of original research. But at the same time the fraction of any science necessary for the furtherance of any other art, must harmonize with knowledge to which we have attained; thus far must we go and no farther. It is for this reason that I agree so thoroughly with what Dr. Attfield has advocated. I might, perhaps, object to a few of the individual names which he has proposed, but really these things are so much a matter of taste, and his paper has been so well and ably discussed, that I do not consider this the time or place to enter into such small matters.

Dr. Attfield makes use of a paragraph which seems to lay down a principle, which principle would, however, hardly agree with the practice of his own paper. Great prominence has been given to this supposed principle by some of the reviewers. Thus, an excellently-conducted one, the *Chemist and Druggist*, says, "Clearly he has proved his point, and shown that chemistry and pharmacy, though branches of the same science, have distinctive characters, and that it will be for the mutual advantage of both to adopt a nomenclature of their own."

Now, I must dissent from this view. A nomenclature is only a system for the conveyance of facts. It is not to be supposed that we could have two nomenclatures harmonizing equally, if at all, with facts. As well might we some years since, when the avoirdupois ounce was substituted for the troy ounce, have said that as the division of the pound gave 437·5 grains to the ounce (which was inconvenient), pharmacy should have an arithmetic of its own, and that 1 and 1 in mathematics made 2, but in pharmacy they should make 3. No! We must have the same chemistry for the philosopher, the same chemistry for the pharmaceutist, and the same chemistry for the medical man,—in other words, as near the truth as the science of the day will take us, and nothing but the truth. It was for this reason that I saw with pleasure that Dr. Attfield hit hard at such terms as *acidum arseniosum*, which, from a chemical point of view, are radically wrong. We are informed that there is not likely to be a new edition of the Pharmacopœia for some time, but I am quite convinced that when it does come we shall have the new atomic weights, and a binary notation and nomenclature in conformity with the new system alone. Thus will Dr. Hofmann's prophecy be fulfilled as regards another important branch of practical chemistry.

One of the proposed changes is, that the names should convey more accurately the actual chemical composition as found by analyses. Thus, it is proposed that the term oxyacetate of copper should be used for verdigris. The few cases met with in the Pharmacopœia similar to the above one are, I think, better got over by using trivial names, just as we in the Pharmacopœia specify a certain well-known quality of carbonate of calcium as chalk, although we have at the same time the pure article as far as ordinary chemical processes will give it. In fact, it is hard to say how the excess of oxide of copper found in the verdigris can be considered any more or less of an impurity than the silica found in the chalk. I am of opinion that we are rather too much inclined to view chemical decompositions as much too sharp and definite, and then in some instances to be too particular. Because we see a voluminous precipitate tumble down on adding hydrochloric acid to nitrate of silver, we are naturally predisposed to consider it as a perfect precipitation of all trace of silver; but, although such may practically be the case as far as our method of detection goes, it is really a rearrangement of the balance of forces which has a limit; and it is most probable that even with this the most definite of reactions, the precipitations is incomplete, and that, if we had instruments or reactions delicate enough, we should perceive such to be the case. That is to say, in nature there is no such thing as very sharp and hard lines. Thus, when we get a basic carbonate of magnesium on mixing carbonate of sodium and sulphate of magnesium in equivalent proportions, it is merely that some of the carbonic anhydride is partitioned off by the new arrangement of the forces; that the point where this partitioning off lies depends upon many circumstances, but principally that of temperature, and we get a precipitate of carbonate of magnesium, containing variable quantities of oxide of magnesium as an accidental impurity. Under such circumstances, should we not be nearer the truth by retaining the name carbonate of magnesium in this and similar cases, and give the notation as a hydrated carbonate of magnesium, and merely state amongst its characteristics that it contains generally 10 per cent. of oxide of magnesium?

I think the great difficulty in the perfect acceptation of the new nomenclature and notation in Pharmacy is, that most of the medical licensing bodies do not make it compulsory that the candidates should answer in the new notation. As long as it is optional with the medical student, it will never be perfectly adopted, for Pharmacy must sail in company with the practice of medicine. Now we find that in the year 1870 there were in this kingdom 1160 medical students registered, being much in excess of the pharmacists. With the Pharmaceutical student the acceptation of the new system is easy; chemistry is his principal and most difficult study. With botany it constitutes all his science; he must have both a theoretical and practical knowledge of it, or he is no pharmacist. He therefore will not mind a little more trouble, for the new system is a degree and only a degree more difficult. But chemistry hitherto has formed but a moiety of the medical student's study, and the little he did learn he looked upon as a matter of secondary importance. In such a case, if the student is presented with two roads, he will very materially take the short one.

Before concluding, I may as well state that I consider the nomenclature of the compound preparations of the Pharmacopœia open to a little revision; this would, however, be too long a subject to go into here. Thus I take it, that all those preparations should be named according to their most active therapeutic ingredient, the substances used as vehicles being ignored. If more than one active ingredient is used, it should be called a "compound" preparation. This is hardly carried out by the name 'tinctura camphoræ composita,' a preparation where there are 40 grains of opium to 30 of camphor; by the omission of composita from tinctura sennæ, or tinctura rhei, whilst such names as linimentum potassii iodidi cum sapone might be shortened by leaving out the latter part. I hope, however, we shall have as little change as possible; but when we do make any, let it be to keep pace with the progress of science. There is no danger of Macaulay's New Zealander appearing on London Bridge for some generations to come; therefore, there is a long period before it for Pharmacy to assert itself in this country. It is to be done by ever bearing in view "that banner with the strange device—'Excelsior.'"

Votes of Thanks.

Dr. Proctor moved a vote of thanks to the authors of the papers which had been read at the Conference.

Mr. Kinninmont seconded the motion, which was unanimously agreed to, and the thanks of the meeting were conveyed by the Chairman.

Mr. Schacht moved that the cordial thanks of the Conference and non-resident members be given to Mr. Mackay, Mr. Baildon, and the other members of the Local Committee for their successful efforts in organizing the present meeting, and for the excellent manner in which they had made all the necessary arrangements. He said they had been fortunate in having been received in such a cordial manner, and with such hospitality and enthusiasm, by the Committee in Edinburgh.

Mr. Savage seconded the motion, which was supported by Mr. Atkins and Dr. Attfield, and cordially agreed to.

Mr. Baildon (as Chairman of the Local Committee) returned thanks.

The Chairman then read a letter from Mr. Reynolds as follows:—

"*Leeds, July 29th*, 1871.

"My dear Mr. President,—The effects of my late accident incapacitate me from joining in the various gatherings, whether for business or social objects, which happily blend at our Annual Conferences.

"This deprivation causes me regrets, but they are greatly tempered by a consideration of the perfect success of our Association, and the belief that in the 'Year-Book of Pharmacy' the Conference has found a talisman which will secure the lasting adhesion of its large and rapidly-increasing roll of members.

"I have also to ask that I may not again be nominated as one of the General Secretaries.

"My fellow-members have a right to the statement respecting the past management of the Conference which I now desire to make. The general direction of its affairs has been in the hands of Professor Attfield, and month by month and year by year he has devoted his valuable time to its general guidance, and not less to the performance of the minute duties of routine, with a constancy, forethought and method that has been simply perfect. Of the success of the present meeting, and its many pleasant circumstances, no one can feel a doubt who knows anything of the attractions of "modern Athens," and of the earnestness and executive abilities of our brethren who have offered us welcome to the Conference.

"With grateful thanks to those colleagues and other fellow-members, to whom I am indebted for so many evidences of kindly feeling during an intercourse of eight years,

"I am, my dear Sir,
"Very faithfully yours,
"Richd. Reynolds."

Dr. ATTFIELD referred at some length to the great services which had been rendered by Mr. Reynolds, and said they all regretted his absence from the Conference.

It was unanimously agreed to convey to Mr. Reynolds an expression of their regard towards him.

ELECTION OF OFFICE-BEARERS.

The following office-bearers were then unanimously elected:—

President.

H. B. BRADY, F.L.S., F.C.S., Newcastle-on-Tyne.

Vice-Presidents who have filled the office of President.

H. DEANE, F.L.S., Clapham Common, S.
Professor BENTLEY, F.L.S., M.R.C.S., 17, Bloomsbury Square, W.C.
D. HANBURY, F.R.S., F.L.S., Clapham Common, S.
W. W. STODDART, F.C.S., F.G.S., Bristol.

Vice-Presidents.

J. INCE, F.L.S., F.C.S., London.
J. WILLIAMS, F.C.S., London.
R. REYNOLDS, F.C.S., Leeds.
W. D. SAVAGE, Brighton.

Treasurer.

G. F. SCHACHT, Clifton, Bristol.

General Secretaries.

Professor ATTFIELD, PH.D., F.C.S., 17, Bloomsbury Square, W.C.
F. B. BENGER, 1, Market Place, Manchester.

Local Secretary.

T. GLAISYER, 11, North Street, Brighton.

Other Members of the Executive Committee, 1871–1872.

M. CARTEIGHE, F.C.S., London.
T. B. GROVES, F.C.S., Weymouth.
F. SUTTON, F.C.S., Norwich.
C. EKIN, F.C.S., Bath.
J. MACKAY, F.C.S., Edinburgh.
T. GREENISH, F.C.S., London.
C. UMNEY, F.C.S., London.
F. C. CLAYTON, Birmingham.
W. SMITH, Brighton.

Auditors.

H. C. BAILDON, Edinburgh.
J. SCHWEITZER, Brighton.

A cordial vote of thanks was then awarded to the Chairman, and the proceedings of the Conference were brought to a close.

Parliamentary and Law Proceedings.

THE ALLEGED POISONING BY A LADY.

On Friday, September 8th, Christiana Edmunds was again brought up on remand, charged with the murder of Sydney Albert Barker.

Another boy deposed that he had been sent by a lady, whom he believed to be the prisoner, to purchase chocolate-creams at Mr. Maynard's.

An assistant to Mr. Maynard deposed that on various occasions when children had been to purchase chocolate-creams a boy was sent after them in order to watch to whom they were given: and a boy in Mr. Maynard's service deposed that on one occasion he saw the messenger delivered the creams to Miss Edmunds, who was waiting for them.

Some children were also examined, who said that a lady, whom they believed to be the prisoner, had given them chocolate-creams in the street, which they ate, and that they were afterwards ill.

Mr. Maynard, the retail seller, and Mr. Ware, the wholesale manufacturer, deposed that they had never before had any similar complaint concerning the chocolate-creams.

The prisoner reserved her defence, and was committed for trial on this charge, and also on another of attempting to poison the wife of Mr. Garrett.

MYSTERIOUS DEATH OF A SURGEON.

An inquest was held on Wednesday, September 6th, at Birkenhead, on the body of Mr. James Douglas Murray, surgeon, who was found dead on Tuesday afternoon under somewhat mysterious circumstances. On Tuesday forenoon he visited her Majesty's ship 'Eagle,' at present used as a training-ship for the Naval Reserve, and attended to his business as usual, and he then appeared to be in his usual good health. In the afternoon, shortly before five o'clock, he was found lying dressed on his bed, apparently in a fainting fit, but the medical men who were called in found that he was dead. On a chair close to the bed there was a bottle which contained chloroform, and it is supposed by the deceased's friends that he had taken an overdose of this anæsthetic to allay toothache, from which he had been suffering. The deceased was only twenty-three years of age, and appeared never to have suffered from any bodily ailment. In his bedroom some bottles were found, and one of them had contained prussic acid. The inquest was adjourned for a *post-mortem* examination of the body.

POISONING BY CARBOLIC ACID.

An inquest was held on Saturday, September 9th, at Wimpole Street, Cavendish Square, on the body of Mrs. Jane Jackson, wife of a physician. Mr. Paul Jackson, husband of deceased, said that on Wednesday night last he heard that she was taken ill. On inquiring the cause the servant informed him that it was from the same cause as before, viz. excessive use of spirits. He went to bed. The following morning the servant informed him that deceased was worse, and he went to see her. Ten minutes after leaving the bedside he was called up again, and found she was dying. Dr. Murchison was fetched, and he found the towels used by deceased smelt of carbolic acid. He kept carbolic acid in his surgery, which, on account of the great craving deceased had for spirits of any kind, was usually kept locked. He believed she took the carbolic acid in mistake for methylated spirit, both of which were kept in gallon stone bottles. He believed that after she had taken the carbolic acid she took some ether, which made her insensible to the pain arising from the carbolic acid.

Mr. Charles Jackson said that on Wednesday night, by his father's instructions, he went upstairs and found deceased lying on the floor. Having seen her so before, he left her, and with his father visited her in about two hours after. She was then in a stupor, which they concluded was from intoxication. He visited her again the next morning, shortly after which she expired. He had since discovered carbolic acid on the bedclothes. He believed she took the carbolic acid from the surgery in pure mistake.

Kate Walsh, a maid-servant, deposed to finding deceased in the bedroom on Wednesday night in a state of insensibility. The same steps were taken as on former occasions, viz. giving her tea, etc., to restore her.

Dr. William Cayley, M.R.C.P., Professor of Anatomy at Middlesex Hospital, said he made a *post-mortem* examination. The body smelt strongly of carbolic acid, the membranes of the brain were thickened, the tongue whitened, the lungs smelt strongly of carbolic acid, the stomach was intensely inflamed, also the small intestines and mucous membrane. The stomach contained a pint of dark fluid, also dark globules, which, after the application of tests, were found to be carbolic acid; and the cause of death was poisoning by carbolic acid.

The jury returned the following verdict:—"Death from poisoning by carbolic acid, taken by accident."—*Daily News*.

Suicide by Corrosive Sublimate.

On Friday, September 8, an inquest was held at the Middlesex Hospital, Charles Street, touching the death of Mr. Samuel Dutton, a smith and bellhanger, residing in Soho. Henry Alder said he had been employed by deceased. On Tuesday last he was called out of the shop into the yard, when deceased said he had taken corrosive sublimate. Witness brought some salt and water, but he would not take it. He brought him in a cab to the hospital. Dr. Lucas stated that deceased was admitted into the hospital on Tuesday, and died the same day. He was suffering great pain from an irritant poison, and was in a state of collapse. He had swallowed about 75 grains of corrosive sublimate, which was the cause of death; but he had vomited so freely that there was no reaction. The stomach was much inflamed. Verdict, "Suicide whilst of unsound mind."—*Standard*.

Case of Suicide at Leeds.

An inquest was held by Mr. Emsley, the Leeds borough coroner, on September 8, touching the death of John Marshall, aged sixty-six, a gentleman who lived with his brother-in-law, Mr. Fox, in Grafton Street. The deceased was formerly in business as a sawyer in America, where he resided for twenty years, and from which he returned about a year since. Whilst in America he had a sunstroke. This caused him to have violent pains in his head at intervals, and sometimes he expressed himself afraid that he might lose his senses. On Wednesday afternoon the pain attacked him with great severity. He went to the Stag Inn, in Camp Road, and there he was observed to be very strange in his manner. He told Mrs. Bateson, the landlady, as he was leaving the house, that he should never come back again, and, pulling out his watch, he asked her to note the hour. He went home, and his conduct being so singular, Mrs. Bateson thought it proper to follow him, and to see him in the house. She found him lying on the sofa, all trembling. Asking him what was the matter, he pointed to his throat, and he signified that he had swallowed some strychnine, a quantity of which poison still remained in a small bottle he pulled out of his pocket. He told her that he had brought the poison from America. Death took place in about half an hour, and the symptoms all pointed to strychnine poisoning. Mr. Seaton, surgeon, who was called in, stated that the bottle contained about forty grains of strychnine. The jury returned a verdict "That the deceased committed suicide whilst influenced by temporary insanity."

[*** It is worthy of note that in this case, as in many others that have been published, the poison used by a suicide had been in his possession for a considerable time, and had been obtained from a source extraneous to that of a retail purchase from a chemist.—Ed. Pharm. Journ.]

The Weights and Measures Act.

On Monday the magistrates of the city of Canterbury gave rather an important decision under this Act. The Chatham Paper Mills Company, who have a manufactory in Canterbury for the preparation of rags, were summoned by the local inspector for having an unjust weighing machine. The fact of the machine being incorrect was not so much questioned as the right of the inspector to enter the premises; it being argued, on the latter head, that he had no power under the Act to test weights and measures other than those which were used for ascertaining the measure or weight of goods exposed for sale. The company's premises were used as a warehouse simply, and it was contended that the inspector had no more right to enter, in order to test the weights, than he had to make visits to the residences of private persons, where weights, etc. were probably kept to test the quantities of goods brought into the house. The Bench held the objection to be valid, and dismissed the information.—*Times*.

Review.

Storia della Farmacia e dei Farmacisti, appò in Principali Popoli del Mondo. Per Federigo Kernot. Naples. 1871.

The Italians have shown during the last twenty years so many sterling qualities in their struggle to regain their former position among the nations, that every additional proof of their vigour and activity in whatever direction it may show itself must be heartily welcomed, and we therefore gladly bear witness to the intrinsic value of Mr. Kernot's work both as a national and as a pharmaceutical achievement. The author has studied his subject well, and he has the gift of interesting, even fascinating writing; he is an enthusiastic pharmacist (the title-page shows a picture of his shop-window), but his enthusiasm is of a lofty and high-minded character; the sentiment of an ancient pharmaceutical obligation at the beginning of the first chapter vibrates through the whole book, "Je jure et promets avant Dieu . . . de donner aide et secours indifféremment à tous ceux qui m'emploieraient, et finalement de ne tenir aucune mauvaise et vieille drogue dans ma boutique."

In many countries where, as in England, the pharmacist is more of a tradesman, there is, as with us, an earnest and hopeful endeavour to raise him to the more dignified position of a professional man, which he has long obtained in Germany and elsewhere; and we must be very much mistaken unless this book will greatly assist in elevating the Italian pharmacist in his social and professional position.

The book is divided into two parts, viz. ancient and modern pharmacy. The first part, and we intend to speak to-day of this only, leaving the second for future consideration, consists of seven chapters, most of which are very interesting, while others do not bring many new facts; and this is not to be wondered at, if we consider that it is the first Italian book ever written on pharmacy proper.

In tracing back the history of pharmacy Mr. Kernot has no hesitation in beginning with the beginning. He goes back to Adam, because with his fall human nature became heir to all bodily infirmities, and remedies were empirically employed long before the science of curing had been born. Many quotations from Scripture are given in proof of the application of pharmaceutical remedies.

In these warlike times it will be interesting to learn that the first ambulance was established under the walls of Troy by Æsculapius' two sons, Mæonius and Podalirius, who had collected all medicaments required by the warriors.

The first shop is mentioned by Aristophanes 1160 B.C. in one of his plays, where a certain Lamachus, with a broken leg, and another roisterer with a broken head are taken to Doctor Pittalo's iatrion, which meant a room filled with plasters and other preparations for internal and external application.

Passing through the most ancient times, the author gets to the early history of pharmacy in France, where we meet with a curious obligation the pharmacists of the thirteenth century had to take; it consists of a confession to live and to die in the true faith, to love, honour and respect his parents and former masters, and a long list of special items, clearly illustrating the pharmacist's position to the general public and to the medical profession.

The first pharmaceutical corporation was established in Bruges, 1297; at the commencement of the fourteenth century they had a large meeting room, a chapel, a corporation seal, and bye-laws; they enjoyed the exclusive privilege of vending medicines, and members of high and distinguished families were proud to join them and hold office.

The first regular shop was opened at Paris in 1336, at London in 1345, and in Nuremberg in 1404. In 1497 the first law referring to the inspection of pharmacies was published.

It is surprising to find how very early proper regulation and inspection was recognized in France; a law, dated 1352, prescribed that the head of the pharmaceutical corporation, assisted by two masters in medicine, chosen by the dean of the medical faculty, and by two pharmacists appointed by the Provost, should twice a year inspect every business in Paris and suburbs, viz. at Easter and at All Saints; and this inspection was looked upon as so important, that the members elected for the business had to swear to be guided in this work only by the spirit of the regulation, without favour or malice to any one, and to act for the public good and the welfare of human nature.

The pharmacists themselves had also to take solemn oath as to the manner in which they carried on their business, the concluding sentence of which was that they will do nothing against justice or morality of the craft, be it from avidity of gain, from particular malice, or any other cause whatever.

The author not unjustly observes that the laws passed from time to time in respect to a certain branch of industry, often give the best idea of its development, and for this reason he has collected all the laws respecting French pharmacy from 1312 to 1777, the year of the foundation of the College of Pharmacy, and thence down to the most recent times, and many stringent and salutary regulations are there to be found.

With true southern liveliness the author describes the invention of the enema apparatus, which he looks upon as an epoch in pharmacy as important as the discovery of America in the history of human civilization. The glory of the invention of this instrument, so beneficial to suffering mankind, belongs to an Italian, Gatenaria, whose name ought to find a modest place together with Columbus, Galileo, Gioja and other eminent and illustrious Italians; he was compatriot of Columbus and Professor at Pavia, where he died in 1496, after having spent several years in the perfection of his instrument.

The enema apparatus may be justly named the queen of the world, as it has reigned without a rival for 300 years over the whole Continent, besides Brazil and America. The enema came into use soon after the invention of the apparatus itself. Bouvard, physician to Louis XIII., applied 220 enemas to this monarch in the course of six months; in the first years of Louis XIV., it became the fashion of the day; ladies took three or four a day to keep a fresh complexion and the dandies used as many for a white skin. Enemas were perfumed with orange, angelica, bergamot and roses; and Mr. Kernot exclaims enthusiastically, "Oh! se tornasse questa moda" (oh, that this fashion would return!)

The medical profession first hailed the invention with delight, but soon found the application *infra dig.*, and handed it over to the pharmacist; but shameful invectives, sarcasms and epigrams hurled at those who exercised the humble duty of applying the apparatus, made them at last resign it to barbers and hospital attendants.

As a specimen of these epigrams the author gives the epitaph on a tombstone of an ancient pharmacist:—

> "Ci gît qui pour un quart d'écu
> S'agenouillait devant un cu."

But to return to some of the ancient French laws. A decree of Parliament, dated August 3rd, 1536, ordered, under a fine of 100 marks silver, of corporeal punishment and eventually the gallows, strict adhesion to certain rules laid down 1514; these rules referred to proper inspection, to the preparation of remedies and their *quid pro quo*. This expression, for the first time officially used in this decree, had the honour of passing into all languages, and its original meaning was as follows:—A great many substances employed by the pharmacists came from foreign parts, and, as it often was difficult or impossible to obtain them, it became necessary to substitute others somewhat similar in their action; hence *qui pro quo*, *quod* or *quale pro quo*, originally meant the substitution of a drug easily obtainable in place of another scarce one.

The same decree ordained that two medical men and four pharmacists, good, honourable, well-established and experienced men, after having taken a legal and binding oath, should twice a year, during Lent and in August, inspect the drugs, which the pharmacists were bound to expose on a table from six in the morning to six at night, and within twenty-four hours after their arrival in Paris; and if the drugs were found to be spurious, or of inferior quality, they were to be put in a bag, taken before the Provost, and then to be burnt before the offender's house. The inspectors had on the same day to send to the police a report of their examination, and to practically demonstrate before the provost the efficacy or otherwise of the drug.

The interesting account of the French laws is followed by a history of embalming, and by a curious record of *poets* who sang and wrote the praise of pharmacy, of whom we can notice only one or two English writers. In 1665 a remarkable work was published by Dr. Steward, entitled 'The Urinal of Physic,' with an appendix on the abuses of medical men and pharmacists.

During the reign of William III. Samuel Garth published a satirical epic named 'The Dispensary.' He had opened in York a business under the name of dispensary, in which he supplied the poorer classes at very low prices; this gave rise to so much animosity against him on the part of the other pharmacists who had combined against him, that he finally was obliged to close his business, when he revenged himself with the poem.

In 1569 a book was published in London under the title 'The Secrets of Alexander,' coming not exactly under the description of pharmaceutical poetry, but containing many excellent remedies for various diseases, wounds and accidents; prescriptions to preserve eternal youth and to stave off old age. A very simple cure of the plague is as follows:—"Procure a branch of the rue, of the nut and of the fig-tree; eat them all three, and you will be cured." Among much nonsense and prejudice of the times is found much good advice. There are excellent receipts for perfumed oils and waters, which might be followed with advantage at the present time.

The second part, dealing with the state of pharmacy in different countries, must form the subject of a separate article, as the accounts of pharmacy in China and other foreign countries will, we believe, be read with great interest.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

The Examinations, North British Branch.

Sir,—Will you allow me to ask Mr. Mackay on what grounds the Board of Examiners in Edinburgh, at the examination on the 18th July, 1871, placed before the candidates for the Preliminary precisely the same questions that had been circulated throughout the country by the London Board at the general examination in the preceding January and April? The questions in Latin, Arithmetic and English, to which I refer, were also published in the Journals of Jan. 21 and April 22, 1871.

"One who has Passed."

The Council of the North British Branch of the Pharmaceutical Society.

Sir,—Had I anticipated that my remarks upon the conduct and working of this Council were to enter the breasts of Mr. Mackay and some of his friends with such bitterness, I certainly would have hesitated before I entered on this discussion. As it is, however, I cannot see that there is any cause for regret being expressed or exhibited in regard to the matter, either by one party or another. Burns, in one of his thoughtful moments exclaims, "Oh! that we could see oursel's as others see us," and I think our Edinburgh friends might do worse than endeavour to have a little of the insight the poet so much desired. They seem to think that because the late Mr. Jacob Bell decreed that a self-elected council should be established at Edinburgh, and that because they have gone on undisturbed in their own quiet way for twenty years, this state of matters should continue to exist, and, like Tennyson's 'Brook,' "Flow on for ever."

It may have been all very well in those early days when the members of the Society in Scotland were a mere handful, and mostly confined to the Scottish capital, and when few took any active interest in the Society; but now that its membership is extending far and wide, and these taking a much deeper interest in its affairs, I maintain that it is time some steps were taken to extend the influence and usefulness of the "North British Branch;" and I am glad at the acknowledgment Mr. Mackay has made, that some such scheme is lurking in the brain of some of the members of Council. I only hope that it will not be long until we have Mr. Mackay's fair promises of amendment realized, and this scheme before us for discussion.

I do not intend, at this time, to enter into the details of Mr. Mackay's elaborate and eloquent epistle. I observe others have taken up the matter, and I shall leave it to them. I may, however, say, that my object in opening up the question is as much for the common good of the Society as any of Mr. Mackay's past efforts have been; and I repeat, that I have not done so out of jealousy, or desire to accuse unwittingly, or even to lower in the estimation of the members the great efforts Mr. Mackay and his friends have made in past years to raise and uphold the status of the Society. I am confident of all this, and I believe I would be wanting altogether in that generous nature which characterizes our race, did I not acknowledge it. At the same time, I hold that since the passing of the Act in 1868,—and I say it without fear of contradiction,—the representatives of this Council have not acted towards the Scottish pharmacists in the manner they should have done, from their position and standing. In conclusion, Mr. Mackay accuses me of misapprehension. I find, however, I am not alone in this; the idea of having Examining Boards in all the large towns is an old theory, and which, to my mind, has been exploded long ago, I therefore could not argue for anything of the kind.

A word to Mr. Kinninmont. He has endeavoured to blow hot and cold in one breath; he is a man of peace, however, and abhors warfare, unless when there is real necessity for it; and being for many years back a member of this Council, although he has seldom taken an active part in its proceedings, he possibly considers there is no need for the present discussion.

J. M. Fairlie.

St. George's Cross, Glasgow, September 12th, 1871.

Prescription Writing.

Sir,—In the very serious case of Mr. Wall, whose death was caused by an overdose of morphia, it is stated in the medical evidence that there was great carelessness undoubtedly on the part of the chemist. Another doctor said that, although he should not have made the blunder, yet it was quite possible that a person might have made a worse mistake, as the writing of the prescription was very bad. These remarks induce me to ask the question, why do medical men write so carelessly and illegibly? The dispensers are at a loss frequently to make their prescriptions out satisfactorily. In my experience, extending over forty years and upwards, I have had prescriptions brought to me to prepare so difficult to decipher, that not even all the doctors in the town could make them out, and they have left me to use my own discretion as to their preparation. It will be admitted by those engaged in this onerous duty that we are often placed in this position, whereas there ought not to exist the slightest doubt in such matters.

I hope these remarks may meet the eyes of those they are intended for.

September 12th. M. P. S.

Homœopathic Chemists.

Sir—May I be allowed to protest in the pages of the Pharmaceutical Journal against the late judgment of the Council in the case of Messrs. Gould and Wyborne? I think that the gentlemen who voted against Mr. Williams' motion would have done better to have remembered the maxim, "In necessariis unitas, in dubiis libertas, in omnibus charitas."

When gentlemen go up for the examinations, they are never asked whether they are homœopaths or no, but are simply passed according to their merit, and it is very hard on homœopathic chemists, who were in business three years before the Act, if they be debarred from the same privileges as their allopathic *confrères*.

As to Mr. Groves' argument, "the booksellers and others," agents for homœopathic medicines, do not, as far as I am aware, dispense doctors' prescriptions, but simply sell the phials of medicine ready done up, and therefore would not be eligible under the Act. Also Mr. Groves, in thus despising booksellers, apparently forgets the many allopathic chemists in the country who are Italian warehousemen.

H. Edmonds.

20, *Bishop's Road, September 12th*, 1871.

Sir,—I fear that Mr. Groves and those members of the Council who supported his opposition to the admission of Messrs. Gould and Wyborn as members of the Society, on the ground of their being homœopathic chemists, will be horrified to learn that their laudable endeavours to preserve the purity of the Society, and to prevent its contamination by the homœopathic heresy, have been vain and fruitless, and that we are already infected by the plague.

I know one homœopathic chemist who is not merely M.P.S., but is also pharmaceutical chemist; and not only so, but having allowed his subscription to lapse for several years, paid up his arrears in 1868, and was restored to membership by a vote of the Council. Now, whether it was that the Council at that time was more liberally disposed, or that his heretical opinions were not known, or that Mr. Groves was not there to protect the purity of the Society, or that his having taken the disease after arriving at years of discretion, affected the decision, I cannot say, but he was reinstated, and continues to be a member, no one molesting him or questioning his right to be so.

Without, however, entering into the question of right, I believe that as a matter of policy Mr. Groves and his friends have made a grave mistake in refusing to elect Messrs. Gould and Wyborn, for it should be remembered that if homœopathy be true, it will succeed in spite of all the opposition they can offer; and if not true, it was very unwise to give it a fictitious importance by refusing two of its professors admission to the Society, and thus, to a certain extent, making martyrs of them.

The discussion shows also in a remarkable way how men's prejudices influence their judgment. In the poison regulation case, "may" is held to mean "must;" whilst in the present instance, "may," which is as nearly "shall" as possible, is interpreted as meaning "you may do just as you please." Surely if the former is a positive duty, the latter is equally so.

Besides, when we remember that in future no one can legally practise as a homœopathic chemist without passing the Society's examinations, it does seem somewhat absurd to tell a man that if he does certain things he may be elected a member or associate of the Society, as the case may be, and then refuse to admit him when he offers himself for election.

263, *Cheetham Hill, Manchester,* W. WILKINSON.
September 12*th*, 1871.

Sir,—At the meeting of the Council held on the 6th inst., Mr. Edwards asked if there were any homœopathic chemists members of the Society.

With your permission, I will answer that question, and offer a few remarks on the subject which led to this question being put.

There are several homœopathic chemists who style themselves "Member of the Pharmaceutical Society."

Mr. J. M. Rendall, of Exeter, is one of them.

Also, some of their assistants are members of the Society.

It is, therefore, more than probable that the proposal will again be made to admit homœopathic chemists who are registered chemists and druggists to membership with the Society.

The observations which were made respecting the scientific education of homœopathic chemists are quite just; for some of them have had no scientific (pharmaceutical) education whatever, but others have had an excellent education, and in scientific attainments will bear comparison with some of the ablest members of your Society.

Unfortunately, for the status of homœopathic chemists, as such, they have (hitherto) consented to be ignored by the new and amended Pharmacy Acts, that they might avoid being subject to the regulations which are made obligatory upon chemists and druggists, pharmaceutical chemists, and members of the Pharmaceutical Society. Nevertheless, being alarmed lest future parliaments should look more closely into their assumed claim to exemption from parliamentary control, they have established a defence society, dignified by the name of "The Homœopathic Pharmaceutical Society of Great Britain." Funds have been provided for defensive and protective purposes, and an appeal was made to all those who styled themselves homœopathic chemists. The inevitable result of this appeal was, that the badly educated and incompetent gladly paid a subscription which entitled them to affix to their names "Member and one of the Founders of the Homœopathic Pharmaceutical Society of Great Britain." Some of the homœopathic chemists, disgusted with this result, have stood aloof from the new Society, and have been registered as "Chemists and Druggists." Also, they propose sending their apprentices before the Board of the Pharmaceutical Society for examination, with a view to their obtaining the diploma of the Society.

I have had twenty years' acquaintance with homœopathic pharmacy, and my experience justifies my dissenting from the remarks made by Mr. Hills. Homœopathic chemists prepare tinctures of many of the indigenous plants, and these are supplied to German and American homœopathic chemists, who in exchange supply tinctures (of plants indigenous to those countries) to the English chemists; they also employ pure chemicals and mineral products in the preparation of their remedies; consequently they are obliged to retain and employ their knowledge of botany and chemistry in their pharmacies.

Again, membership with your Society will prove helpful to the homœopathic chemist, for it will remove him from his present false relationship to the medical profession and to the public.

It is not for the public interest, but altogether prejudicial to it, that the homœopathic chemist should be relieved from the performance of the obligations which have been imposed upon members of the Pharmaceutical Society. He keeps in stock crude drugs and chemicals, including all the scheduled poisons, and occasionally dispenses prescriptions which contain poisonous quantities.

This state of things cannot continue much longer, and a timely recognition by the Pharmaceutical Society of the homœopathic fraternity will tend to separate the wheat from the chaff, and prevent the separation of interests which is altogether unnecessary and injurious.

JOHN PARTON BERRY, M.R.C.V.S., and
Registered Chemist and Druggist.
509, *Old Kent Road, London, S.E.,*
September 12*th*, 1871.

THE CHIPPENHAM CASE.

Sir,—Allow me through the medium of your widely circulating Journal to say a few words in reference to the late sad case of death which has just taken place at Chippenham.

I do it to compare the relative positions occupied by the chemist and doctor after either has been arraigned before a coroner's jury to account either for an accident on the part of the former, or for ill-judged treatment on the latter side.

We see as recently as the last fortnight where a chemist in case of having administered an overdose of morphia in error has had the ill-luck (for I can term it nothing else) to be pounced upon by the Home Secretary, even after the jury had expressed a somewhat sympathetic verdict, and when he (the chemist) had laboured under the difficulty of having to decipher a badly written prescription. The case referred to at Chippenham, however, is very different in respect to the treatment by the authorities of the person charged. Here we have a child to whose head a solution of bichloride of mercury, of the strength of 10 grains to the drachm, or 80 grains to the ounce, has been applied, and who in the course of two or three days sinks from the result.

I should very much like to ask what punishment the chemist might expect to receive from the "authorities" if he should be ignorant enough to make use of such an "outrageously strong" application? Who amongst the trade of chemists, whether apprentice of twelve months' standing or assistant, would think for one moment of using a thing so powerful and caustic to the head of a child?

Never in my experience was an instance more glaring of the injustice of the law in the comparative treatment of the two persons accused.

Is not this a case, amongst unfortunately too many others, which should teach the medical profession generally to show a kinder feeling to those who like themselves follow an anxious and responsible calling? M. P. S.

Sept. 10*th*.

PILLS, ONE PENNY A DOZEN.

Sir,—Your correspondent, N. O. P., complains of the low price charged for dispensing in his neighbourhood; he has reason to congratulate himself they are no worse. The other day a man brought a receipt for making eight dozen pills, and asked how much I would charge to make them up. I said 2*s*. 6*d*., which I considered a moderate price, being less than 4*d*. a dozen. He appeared to be very much astonished and said, "Why, I got them made up at ——, in the Essex Road, for 8*d*. He charged me 2*d*. for each of the articles (the pills were composed of three ingredients), and 2*d*. for making them." Of course I declined working so much below ordinary labourer's wages, and he declined paying more than 8*d*. for them, and so the matter ended. On a par with this we have a man in the Kingsland Road, in an apparently respectable shop, who sells patent medicines at cost price, and many other articles at what the drapers would call "a ridiculous low price." When will druggists learn to study their own interest, instead of cutting their own throats and injuring their neighbours and the trade generally?

Islington, September 4*th*, 1871. FAIR PROFIT.

THE TINCTURE PRESS.

Sir,—In the excellent tincture press of Mr. Staples, of which an account and engraving are given in your last issue, there is one little practical difficulty suggests itself to me, and which no doubt Mr. Staples can easily solve. The cylinder, it appears, stands in the spouted basin, and the basin has no outlet for the expressed juice without unscrewing the press, and by that means emptying it. The ingredients stand in the expressed juice the whole time they are under pressure, without being allowed to drain off. I should be glad to know if there is any difficulty to be experienced on that score before having one made.

I should also like to know where Mr. Staples obtained his tinned iron cylinders pierced as he describes.

320, *Roman Road, Bow, Sept.* 13*th*. S. D.

ERRATUM.—In the article on "Pharmacy in Spain" last week, the words "of the monk" were omitted from the 18th line from the bottom, p. 183, before "of Monte Cassino."

COMMUNICATIONS, LETTERS, etc., have been received from Mr. J. Mackay, Mr. J. J. Macaulay, Mr. Hustwick, Mr. J. Garrett, Mr. G. Pattison, Mr. S. Dean, Mr. Hartley.

"G. P. E." is referred to the notice concerning anonymous correspondents.

DETERMINATION OF GLACIAL ACETIC ACID.

BY FR. RÜDORFF.

The volumetric estimation of acetic acid by means of a standard solution of caustic soda cannot claim very great accuracy, because the change in colour of litmus is not sufficiently marked. Mr. Rüdorff has therefore proposed a new method, readily executed and very accurate, which consists in determining the solidifying-point of the acid.

Commercial glacial acetic acid is never free from water, the solidifying-point of various samples ranging from 7° C. to + 14° C. In order to obtain some perfectly anhydrous, a quantity of the commercial acid was placed in a cold place, until about three-fourths of it had solidified; the liquid part was separated, and the solid portion was remelted, cooled and solidified. The liquid was again separated, and this operation repeated until at last a constant solidifying-point was obtained; this point gradually rose after each separation of liquid, as shown in the following observations, made with a sample of about two pounds:—12°·5, 15°·1, 16°·1, 16°·4, 16°·65, 16°·7, 16°·7, 16°·7 C.

It is advisable to leave the liquid, in which some solid acid separated overnight, in a room the temperature of which is a few degrees below the solidifying-point of the acid; the last then separates in foliated masses, from which the liquid may easily be poured off; this liquid, of course, contains more water than the remaining solid acid.

The solidifying-point of this solid acid is 16°·7 C.; its boiling-point is 117°·8 C. With gradual cooling the temperature may be reduced to 10°, and even 8°·5, and the acid may be shaken without solidifying; but a single grain of solid acid sets the whole mass at once, the temperature rising to 16°·7 C. When melted by placing the vessel in water of about 25° C., the thermometer placed inside the acid indicates 16°·7 C. as long as a considerable quantity of solid substance remains,—proving that the melting and solidifying points are at the same temperature.

100 parts by weight of anhydrous acid were mixed with a weighed quantity of water, and the solidifying-point of the mixture was determined. It must be remembered that a mixture of two liquids does not solidify as such, but only one of them, in this instance acetic acid; while the water remains fluid. Aqueous concentrated acetic acid acts similarly to saline solutions, of which the author has shown that, on freezing, the water alone solidifies.

The proportion of acid and water would be altered if much acid solidified; it is therefore necessary to take care that only very little acid separates. This is effected by cooling the mixture to within one degree of the solidifying-point, approximately determined; after which a particle of solid acid is added, and the liquid well stirred with a delicate thermometer. Repeated experiments show a difference of not more than 0°·1 C. The following table contains the results of a series of observations, viz.:—

100 parts by weight of acid mixed with water.	100 parts of mixture containing water.	Solidifying-point. Degrees.
0·0 Water.	0·0 Water	+ 16·7 C.
0·5	0·497	16·65
1·0	0·990	14·80
1·5	1·477	14·00
2·0 Water.	1·961 Water	+ 13·25
3·0	2·912	11·95
4·0	3·846	10·50
5·0	4·761	9·40
6·0	5·660	8·20
7·0	6·542	7·10
8·0	7·407	6·25
9·0	8·257	5·30
10·0	9·090	4·30
11·0	9·910	3·60
12·0	10·774	2·70
15·0	13·043	— 0·20
18·0	15·324	2·60
21·0	17·355	5·10
24·0	19·354	7·40

The table shows that especially in concentrated acid one-tenth of a percentage of water may be accurately determined.

Several other substances act like water in reducing the solidifying-point of acetic acid; for instance, sulphuric acid, alcohol and several salts soluble in the acid. A mixture of 100 parts of acetic acid and 0·5 part of sulphuric acid solidifies at 16°·4 C.; 100 parts of acid and 1·8 parts of alcohol at 15°·25 C. The influence of water may be partly counteracted by sulphuric acid; thus, from a mixture of 100 parts of acid and 10 parts of water the acid separates at 4°·3 C.; an addition of 2 parts of sulphuric acid raises the point to 5°·8 C., and 20 parts of sulphuric acid added to the same mixture bring the point up to 10°·7 C.

The solidification of acetic acid takes place even in summer with absolute accuracy. The acid is cooled to about 10° or 12° C., a particle of solid acid is added, and on shaking the bottle the acid solidifies forthwith. A small quantity of solid acid is easily obtained by placing a test tube containing a few drops of liquid acid in a mixture of chloride or nitrate of ammonium and cold water.—*Wittstein's Vierteljahrsschrift für prakt. Pharm.*, 1871, p. 84.

ERGOT OF RYE.

BY DR. T. C. HERRMANN.

Although ergot of rye has been repeatedly subjected to chemical analysis, there are several questions touching its component parts which have not been fully explained, and for this reason Dr. Herrmann has chosen the subject for his inaugural dissertation.

One of the constituents of ergot which required further investigation is the fatty oil, which, though not differing from other oils in general characteristics, is peculiar so far, as according to Manassewitz, it readily saponifies with caustic soda, but not at all with caustic potash; this statement Dr. Herrmann was enabled by his investigation to distinctly contradict.

20 ounces of powdered ergot were exhausted with ether, the last separated by distillation, and the oil, which amounted to 6 ounces, subjected to analysis. It was of a brownish-yellow colour, of aromatic flavour and acrid taste, viscid, and its sp. gr. was ·9249, it was not drying.

It consisted chiefly of palmitic acid, oleic acid and glycerine, in the proportion of 22·703 per cent. palmitic acid, 69·205 oleic acid, and 8·091 glycerine; it also contains traces of acetic and butyric acid, of trimethylamin, ammonia and ergotine as colouring matter.

Manassewitz also doubted the existence of ecboline, the alkaloid first separated by Wenzell, and Dr. Herrmann also settled this point.

30 ounces of powdered ergot were for several days digested with warm water, the aqueous extract mixed with acetate of lead, and the precipitate separated by filtration, excess of lead in the filtrate was separated by carbonate of soda, which, however, did not precipitate all the lead, the liquid remaining turbid even after filtration; it was therefore slightly acidified with muriatic acid and thin dilute sulphuric acid added, which gave a clear solution; to this an excess of chloride of mercury was added, the dirty white precipitate was collected on a filter, and the alkaloid ecboline separated in the usual manner. It is soluble in water and alcohol, has a bitter taste and an alkaline reaction, and is precipitated in the following manner, viz. by chloride of mercury white, phosphoric molybdic acid yellow, tannin dirty white, biniodide of potassium reddish-brown, chloride of gold brownish, chloride of platinum orange, only after some time, and cyanide of potassium white.

The inorganic constituents of ergot were also determined afresh, and the following table gives a comparison of former analyses with Dr. Herrmann's results, viz.:—

	Engelmann.	Manassewitz.	Thielau.	Herrmann.
Potash	38·97	38·00	17·92	30·06
Soda	14·39	14·75	11·42	0·65
Lime	1·43	1·50	1·24	1·38
Magnesia	4·58	4·70	2·00	4·87
Alumina	—	—	0·29	0·58
Oxide of iron	2·00	1·80	0·70	0·86
Oxide of manganese	—	—	3·95	0·26
Oxide of copper	—	—	0·53	—
Phosphoric acid	13·24	13·25	58·66	45·12
Sulphuric acid	0·02	—	—	—
Chlorine	2·03	2·10	—	—
Silica	9·13	8·30	2·54	14·67
Carbon	12·66	12·10	—	—
Chloride of sodium	—	—	0·66	1·50
Total	98·45	96·50	99·91	99·95

—*Buchner's Repert. für Pharm.* 1871, v. p. 283.

PRESERVATION OF EGGS.

BY H. VIOLETTE.

Experiments have led Mr. Violette to the conclusion that a thin film of oil is the best means of keeping eggs for a long time.

Fresh eggs kept for three months had lost 11·40 per cent. in weight; after six months, 18·10 per cent.,—they were half empty and rotten. Eggs covered with a thin film of poppy oil had lost, after three months 2·90 per cent.; after six months only 4·51 per cent.,—they were full, of good taste and smell.

Eggs covered with linseed oil lost in three months 2·16 per cent., and in six months only 3·02 per cent.; they were full, and tasted and smelt as good as fresh eggs.—*Journ. de Pharm. et de Chim.* 1869, x. 170.

Chapters for Students.

CHEMICAL NOTES TO THE PHARMACOPŒIA.

BY WILLIAM A. TILDEN, D.SC. LOND.

DEMONSTRATOR OF PRACTICAL CHEMISTRY TO THE PHARMACEUTICAL SOCIETY.

Magnesiæ Sulphas.—Made by the action of diluted sulphuric acid, either upon the calcio-magnesic carbonate, "dolomite," or upon the native magnesic carbonate, "magnesite." The latter, being now largely imported, is used very extensively.

$$MgCO_3 + H_2SO_4 = MgSO_4 + H_2O . CO_2.$$

It is also obtained in some quantity from seawater and from other sources.

[§ In minute, colourless and transparent (right) rhombic prisms. It readily dissolves in water, and the solution gives copious white precipitates with chloride of barium, and, with a mixed solution of ammonia, chloride of ammonium and phosphate of soda ($Mg''NH_4PO_4 . 6H_2O$). Its aqueous solution, at ordinary temperatures, is not precipitated by oxalate of ammonia; nor should it give a brown precipitate with chlorinated lime or soda.] Absence of sulphates of calcium, iron and manganese is thus ensured. Sulphate of magnesium is isomorphous with sulphate of zinc and by appearance indistinguishable from it. The zinc salt, however, gives a white precipitate with sulphydrate of ammonium and with ferrocyanide of potassium, whilst magnesium sulphate gives none. The precipitate, also, which liquor potassæ produces with sulphate of zinc, is soluble in excess, but not so with sulphate of magnesium.

The formula of sulphate of magnesium is—

$$MgSO_4 . 7H_2O;$$

but, as in the case of ferrous sulphate, six molecules only of the water, can be regarded as water of crystallization.

Manganesii Oxidum Nigrum.—A heavy black powder, formed by grinding the mineral, which is found native partly in a crystalline state. It is generally purified from the calcic carbonate, which the crude material generally contains, by treating with diluted hydrochloric acid.

Mixed with strong hydrochloric acid and kept cold, it forms a nearly black solution of manganic perchloride:

$$MnO_2 + 4HCl = MnCl_4 + 2H_2O.$$

On the application of heat chlorine is evolved, and a solution of manganous chloride remains.

$$MnCl_4 = MnCl_2 + Cl_2.$$

It evolves oxygen when heated to redness, leaving a residue of manganous-manganic oxide.

$$3MnO_2 = Mn_3O_4 + O_2.$$

The black manganese of commerce varies greatly in quality, and as it is extensively employed in the generation of chlorine frequent analyses of it have to be made. The best method is Bunsen's. In short, it consists simply in distilling a weighed quantity of the sample with excess of pure hydrochloric acid in a small flask, the neck of which is connected, gas-tight, with a U tube, containing solution of iodide of potassium. The chlorine evolved from the flask, as it passes through the iodide of potassium, liberates an equivalent quantity of iodine, the amount of which is rapidly and accurately determined by means of the volumetric solution of hyposulphite of sodium.

PHOSPHORUS. P = 31.—[§ A non-metallic element obtained from bones.]

Bone ash is digested with sulphuric acid, by which calcic sulphate and a soluble superphosphate are obtained.

$$Ca_3(PO_4)_2 + 2H_2SO_4 = CaH_4(PO_4)_2 + 2CaSO_4.$$

The acid solution is boiled down till it sets into a paste. The acid superphosphate then loses water and leaves a residue consisting chiefly of calcic metaphosphate.

$$CaH_4(PO_4)_2 - 2H_2O = Ca(PO_3)_2.$$

This salt, mixed with charcoal and distilled in earthen retorts, gives phosphorus, which passes over and is received in water, carbonic oxide gas and tricalcic phosphate, which remains behind.

$$3Ca(PO_3)_2 + 10C = Ca_3(PO_4)_2 + 10CO + P_4.$$

The crude phosphorus is coloured brown from the presence of oxide and other impurities. It is purified by melting under water, and stirring up with a mixture of sulphuric acid and chromate of potassium. The pure phosphorus settles as a colourless oily layer. Commercial phosphorus is either in sticks or cakes.

[§ A semi-transparent colourless wax-like solid, which emits white vapours when exposed to the air. Specific gravity 1·77. It is soft and flexible at common temperatures, melts at 110°, ignites in the air at a temperature a little above its melting-point, burning with a luminous flame, and producing dense white fumes.] Exposed to light it becomes covered with a white or sometimes a reddish crust, which is one of the numerous allotropic forms of phosphorus.

[§ Insoluble in water, but soluble in ether and in boiling oil of turpentine.] Also freely in bisulphide of carbon, by the evaporation of which solution phosphorus may be obtained in crystals.

For dispensing purposes phosphorus is sometimes required to be granulated. This is easily effected by placing the requisite quantity in a stoppered bottle with a little proof spirit, immersing the bottle in warm water till the phosphorus is melted, and then shaking briskly till cold.

Red or Amorphous Phosphorus.—The most important of the allotropic modifications of phosphorus is a red pulverulent substance obtained by heating common phosphorus in vessels from which the air is excluded to a point about 100° F. below that at which phosphorus boils. It is purified by dissolving out the unchanged phosphorus by bisulphide of carbon. It is now used, to a certain extent, in the manufacture of matches. It differs from the common kind in being quite insoluble in ether, benzol, bisulphide of carbon, etc., and in being far less easily inflammable. When volatilized it changes back again into common phosphorus.

Common phosphorus is very poisonous; red phosphorus is stated not to be so, though probably this statement refers to the fact that it emits no vapour at ordinary temperatures as the common kind does, and, therefore, that workpeople do not suffer as in the employment of the ordinary kind.

The oxides and chlorides of phosphorus are formulated thus—

Phosphorous Anhydride . . .	P_2O_3
Phosphoric Anhydride	P_2O_5
Phosphorous Chloride	PCl_3
Phosphoric Chloride	PCl_5
Phosphoric Oxychloride	$POCl_3$

There are, therefore, two classes of phosphorus compounds in which P is trivalent and quinquevalent respectively.

INQUIRIES RELATING TO PHARMACOLOGY AND ECONOMIC BOTANY.*

BY DANIEL HANBURY, F.R.S.,

AND PROFESSOR OLIVER, F.R.S.

From the *Admiralty Manual of Scientific Inquiry.*

INDIA, SIAM, AND THE INDIAN ARCHIPELAGO—*continued.*

SALEP.—The tubers of several species of *Orchis* and *Eulophia* are collected and sold in India under the name of Salep. It is desirable to ascertain what species of Orchidaceous plants furnish this substance, especially in the Himalayas and in Cashmere. What is the plant which affords the drug called *Badshah Saleb*, or Royal Salep? Where is it produced, and for what purpose is it valued? It has been exported to England from Bombay.

MANNA.—It has for many years been asserted that a kind of manna is produced in the East on a species of Tamarisk. It requires to be determined whether any oriental Tamarisk yields a saccharine substance of the nature of manna, and whether it is collected, and where?

HEMP.—A very rough but tenacious hemp is produced in Northern India, at Kangra, and elsewhere, and bears the name of "*Kangra hemp*" or "*Himalayan hemp.*" Is this the produce of *Cannabis sativa*, of which there is some doubt?

TANYIN.—What is the source of the "*Tanyin fruit*" of the Burmese trade lists, and what its uses?

MOCHARAS.—This brown astringent substance, which is found in the bazaars of India, is said to be partly derived from *Salmalia Malabarica*, part is said to be an exudation from the trunk of the Areca palm (*Areca catechu*). It would be well to ascertain if any astringent substance is exuded, or whether any galls are formed, as some suggest, on *Areca catechu*. The source or sources of the *Mocharas* should be determined.

RAJAH-CANES, exported from Borneo. The species of palm yielding these is unknown.

What tree affords the so-called *Amboyna* or *Kyabocca* wood?

GUTTA-PERCHA is, even up to the present day, little known. It is said to be yielded by several plants, such as species of *Isonandra, Chrysophyllum, Sideroxylon* and others. Attention should be paid to the vernacular names, such as *Gutta-percha, Ugiato putih, Kotian, Tuban* or *Taban*, etc. Abundant and carefully preserved wet and dry specimens of the leaves, flowers, and fruits of the different kinds, the products of the same individuals from which the dried specimens are obtained, are greatly needed.

CAOUTCHOUC, OR INDIA-RUBBER.—In the Malayan Archipelago there are many trees which yield Caoutchouc. *Urceola elastica* is the source of the Borneo india-rubber.

What trees produce the so-called Singapore rubber, and the Java, Sumatra, and Siam kinds? Are they species of *Ficus?*

* Information relating to any of the subjects here referred to may be addressed to Mr. Hanbury, Clapham Common, near London, or to Professor Oliver, Royal Gardens, Kew.

In Assam *Ficus elastica* is the chief, if not the only source of india-rubber. But *Ficus laccifera* may also yield it. Is any india-rubber collected from the latter, and is it kept separate or mixed with that of *F. elastica?* Specimens of each, accompanied by good dried specimens, would be valuable. Are there no other trees capable of yielding india-rubber in quantity? *Willughbeia edulis*, the "*Luti-am*" of Chittagong and Silhet, is said by Roxburgh to yield good india-rubber. Specimens of the india-rubber, and also carefully-prepared and abundant specimens of the leaves, flowers, and fruit, both dried and in spirit, are much needed.

China, Cochin China, and the Philippines.

Rhubarb.—The true source of the rhubarb produced in the western provinces of China and the adjacent regions is still unascertained. It is desirable to obtain living roots or seeds of the plants, as well as a full account of the collecting and drying of this well-known drug.

Camphor.—That of commerce is obtained from Formosa and Japan. Is any produced in China, and where? The Camphor Laurel (*Cinnamomum Camphora*, Nees), is well known to flourish in many localities of the central provinces.

What is the camphor said to be obtained from a species of *Artemisia* (wormwood) called *Ngai?* A few pounds of it are desired.

China Root is exported to Europe from Canton. The plant is said to grow in the provinces of Honan, Kwangtung, and Kwangsi. Good specimens of it are desired.

Root called *Green Putchuk Pă-chih*, of which large quantities are exported from Ningpo. The plant is an *Aristolochia:* to determine the species, pressed and dried specimens with roots would be acceptable.

Cassia Bark.—Specimens are much desired of the tree which affords this bark in the south of China. Botanical specimens should in all instances include good samples of the bark, young and old, obtained from the same tree.

Cassia Buds.—These are the immature fruits of a *Cinnamomum*, supposed to be that affording the Chinese Cassia bark.

Bamboo.—Specimens in flower of a bamboo, affording the broad leaves which are pinned together by the Chinese to line tea-chests, are required to determine the species.

Star Anise.—Information should be collected by an eye-witness as to the production in Southern China of this spice. It is said to be brought to the Canton market by the Fokien junks. Botanical specimens of the tree, and full particulars regarding the collection of the fruits, are desirable.

Chinese Oil of Peppermint (so-called) is said to be distilled at Canton. Pressed and dried botanical specimens of the plant *seen* to be used should be sent to England for the determination of the name.

Cardamoms.—What is the origin of the cardamom called by the Chinese *Yang-chun-sha*, the *Hairy China Cardamom* of pharmacologists? It is said to be produced in the province of Kwang-tung, and it may be a native of Cochin China.

Nothing is known of the origin of the scitamineous fruit to which the name *Large Round China Cardamom* has been given, and which is known to the Chinese as *Tsaou-kow*. The same remark applies to the *Bitter-seeded Cardamom*, *Yih-che-tsze*, and *Ovoid China Cardamom*, *Tsaou-kwo* or *Quâ-leu;* it is probable that all of them are productions of the south of China, or of Cochin China.

St. Ignatius' Beans, called in the Philippines *Coyacoy*, or *Pepita de Catbalogan*. The plant, said to be a climbing shrub, to which the name *Ignatia amara* was given by the younger Linnæus, is a species of *Strychnos*, probably unknown to modern botanists. It is believed to grow in Bohol and Çebu, islands of the Bisaya group of the Philippines. As it is one of great interest, no opportunity should be lost for procuring abundant flowering specimens, as well as the entire fruits, both dried and preserved in alcohol, and some considerable pieces of the stem with the bark attached.

Elemi.—This resin is abundantly produced in the forests of the Philippines, where it often assists in giving a cheerful blaze to the fire of the traveller. It is also exported from Manilla as a drug. The tree that affords it is probably a *Canarium*, but it is desirable to have complete specimens, including flowers and mature fruits in alcohol, in order to ascertain the species with exactness.

Mexico, the West Indies, Central and South America.

Mexican Elemi, known in Mexico as *Copal*, is yielded by *Elaphrium elemiferum*, Royle, a tree growing near Oaxaca, good botanical specimens of which are much desired.

Sarsaparilla.—The species of *Smilax*, the roots of which constitute the various sorts of sarsaparilla found in commerce, are very imperfectly known. Good botanical specimens, comprising flowers, fruits and leaves, and accompanied by the stem and roots, should be carefully preserved, and transmitted to England for determination. The so-called *Jamaica Sarsaparilla* grows near the Chiriqui Lagoon, in the state of Costa Rica, and a species very similar, if not identical with it, at Bajorque, on the Rio Magdalena, New Granada. Other sorts of sarsaparilla are produced in Mexico, Guatemala, Honduras, Brazil, etc.

Cinnamon of Ecuador.—This bark, which resembles the cinnamon of Ceylon, is produced by a noble tree growing in the province of Canelos. Specimens of it, including flowers and the large fruits preserved in alcohol, are much desired. The calyx of the fruit is used as a spice, under the name of *Ishpingo*.

Balsam of Copaiva is imported from several parts of Brazil; it varies somewhat in properties, and is the produce of several species of the genus *Copaifera*. It is desirable to obtain the balsam of each species, with a specimen in flower and leaf, and, if possible, in fruit, of the tree affording it, and the name of the district where the tree grows, and its native appellation there.

Woods.—Lignum nephriticum.—This rare wood, noticed by some of the earliest explorers of America, is a production of Mexico. To what tree is it to be referred? Its infusion is remarkable for having the blue tint seen in a solution of quinine.

Satin-wood of the West Indies.—Specimens in flower and fruit, with the wood, are requested. The origin of the *Coca* or *Cocus-wood* of the West Indies, is also uncertain. Specimens in flower of any tree affording the lancewoods of commerce in the West Indies or Central America are needed for the determination of the species.

King-wood, Maracaybo-wood and Mustaiba-wood, all imported from Brazil, and Nicaragua-wood from Central America, are of unknown botanical origin.

The Rose-woods of Brazil.—There is still some doubt as to the trees which yield the different varieties of this timber.

Ipecacuanha.—What is the plant which furnishes the *large Ipecacuanha root* of New Granada?

Pareira Brava.—The plant affording the inert woody stems which constitute the *Pareira Brava* of commerce, and which are exported to Europe from Rio de Janeiro, has not been ascertained, neither is the locality in which it grows accurately known. The subject is deserving of investigation.

Cinchona Bark.—In addition to the bark of *Cinchona Tucujensis*, shipped at Puerto Cabello in Venezuela, there are others less known botanically which are brought from the same port. Some of these barks appear to be derived from varieties of *Cinchona cordifolia*, while others seem to belong to what is called *Quinquina* rose d'Ocaña. It would be interesting to have authentic specimens of the flowering and fruit-bearing branches of the trees, together with sections of the branches and trunk (the bark being *in situ*), for comparison with the species described by Karsten.

The so-called *False Cinchonas* may be distinguished, according to Dr. Weddell, by their capsules, which are generally large, and having valves which separate from the apex towards the base. The flowers are relatively large, and devoid of perfume. It would be of some interest to have authentic specimens of the barks of those trees belonging to the genus *Buena* (*Cascarilla* or *Ladenbergia*), in order to ascertain whether they contain alkaloids or not. The barks ought to be accompanied by flowering specimens. Some pounds of each bark would be required for chemical examination.

PARA RHATANY.—This root, imported from Pará in Brazil, is described in PHARMACEUTICAL JOURNAL I. (1870) 84. The plant yielding it should be ascertained, for which purpose good specimens, including *entire roots*, are requisite.

MILK OR COW TREE OF PARA.—Specimens in flower and fruit of this tree, which is called *Massaranduba*, are required for the accurate determination of the species.

CAOUTCHOUC, OR INDIA-RUBBER.—All the Central American caoutchouc is presumed to be obtained from *Castilloa elastica*, the "*Ule-ule*" tree. Are there any other species of this genus, or trees likely to be mistaken for *Castilloa elastica* sources of supply? In New Granada there is said to be a pinnate-leaved tree yielding caoutchouc—what is it?

HEVEA (SIPHONIA) BRAZILIENSIS is the chief source of Para india-rubber, but other species yield it, as *H. lutea*, *H. discolor*, *H. paucifolia* and *H. rigidifolia*. It would be exceedingly desirable to know the relative yield of these several trees, and to obtain good specimens of them.

In Pernambuco and Ceara there is much good india-rubber said to be the produce of *Hancornia speciosa*, the "Mangaba" of the Brazilians. Reliable specimens and information are desired.

In British and French Guiana caoutchouc trees exist, good specimens of which, with their several products, should be collected.

IODIZED COTTON.

BY M. C. MÉHU.

To render easy the absorption of iodine in such a manner that it shall not be released from its combinations too rapidly, and thus to avoid the irritation resulting from the contact of a large quantity of iodine with the skin, is a problem, the solution of which has been sought in various ways. This want has been felt principally in external applications, where the action of the medicament requires to be continued during a length of time. Even before iodine was discovered, burnt sponge was used as a remedy for goitre, it giving off slowly some traces of iodine, when placed in contact with the skin.

Certain compounds of iodine, such as iodide of ammonium and iodide of calcium, when exposed to the air, part slowly with their iodine under the influence of the oxygen of the atmosphere, but they are little used. The author, however, considers the iodide of ammonium to be a salt of great therapeutic value, he having derived much benefit from some external applications of it.

A very old mixture, called the *Collier de Morand contre le Goître*, consisted of equal parts of sal ammoniac, marine salt and burnt sponge. This powder, spread on carded cotton, and afterwards covered with muslin, was applied to the goitre in the form of a sachet or a cravat, and renewed every month. Many other sachets are known in which a mixture of sal ammoniac and iodide of potassium occur as ingredients.

Doubtless the association of sal ammoniac, or chloride of ammonium, with burnt sponge, at a time when iodine was unknown, had exclusively for its object to second the action of the burnt sponge by that of a substance possessing in a high degree analogous solvent, anti-scrofulous properties. But probably modern pharmacists, in reproducing the same association by mixing iodide of potassium with sal ammoniac, have been guided by the observation that this mixture gives off free iodine to the air exactly as if it contained chloride of potassium and iodide of ammonium.

At first, it would appear that a solution of iodine in ether, alcohol or water—in the latter case combined with iodide of potassium—would furnish an easy method for the application of iodine to the skin. But this is not the case, for these solutions are very irritating, and often cause so much pain that their application is impossible except for a short time. If they be employed in a diluted form, it is necessary to remove the bandages frequently, which also causes irritation to the skin.

A preparation of cotton with five per cent. of iodine, which the author has employed for two or three years with complete success, in cases of glandular swellings of the neck in scrofulous persons, appears to be exempt from this inconvenience. It colours the skin without irritating it, and produces a marked sensation of warmth. It parts little by little with its iodine, becomes decolorized, and requires to be renewed every two or three days, according to the locality to which it is applied. In losing its iodine it exercises all the properties of that metalloid, and when applied in the vicinity of wounds acts as a disinfectant.

The iodized cotton is prepared in the following manner:—The iodine is reduced to a very fine powder in a porcelain mortar; this operation is facilitated by the addition of a few drops of ether from time to time during the trituration. A quantity of very dry carded cotton of good quality is then selected, in proportion of at least ten times the weight of the iodine. The cotton is introduced into a large-mouthed ground-stoppered litre flask in little flocks, and with each portion of cotton is added the proportion of iodine in such a manner that it becomes incorporated in the mass of the cotton. The flask is then closed, at first incompletely, in order that the air may escape when expanded by the warmth. It is next placed in a sand-bath or other apparatus, by which it can be raised to a sufficiently high temperature. The flask should be laid horizontally, and turned on its axis from time to time, so as to render the action of the heat uniform, and to obtain a homogeneous iodized cotton. When the warm air has been driven off, the flask is closed by the glass stopper, after which it gradually becomes filled with violet vapours, and the cotton takes the colour of burnt coffee. When this result is acquired, the iodine is completely fixed in the fibre, and the operation is finished. Properly conducted, it should not occupy more than two hours.

Not more than twenty grammes of dry cotton should be put into the litre flask, in order that the mass should be permeable by the vapour of the iodine. Neither is it advisable to exceed the proportion of ten per cent. of iodine; that quantity is the extreme limit, and half that dose is generally more than sufficient.

The sand-bath may be replaced by a water-bath, if care be taken to ballast the bottle in order to keep it under water. This mode is advantageous in pharmacies when operating upon small quantities; but it is only suitable for the preparation of cotton containing not more than three per cent. of iodine.

Even when the cotton has absorbed ten per cent. of iodine it retains in a great measure its tenacity. It is properly of a brown colour, but it becomes black if the temperature be raised too high, or the action of the heat too much prolonged.

If properly prepared, the cotton, upon exposure to the air, gradually loses its iodine, decolorizes, and becomes quite white. In order to preserve it, it should be placed in large-mouthed bottles, with ground-glass stoppers. In default of a ground-glass stopper, a cork that has been steeped for some time in paraffin may be used. A cork so treated resists perfectly the vapour of iodine, which is so destructive to ordinary corks.

When cotton is placed in a concentrated solution of iodine in ether or sulphide of carbon, and exposed to the air, it pretty quickly parts with the solvent, and retains only traces of the iodine, becoming white very soon. With an alcoholic solution of iodine, the cotton retains a large proportion of the iodine. But the employment of selvents to fix the iodine yields but mediocre results, and entails the loss of a large quantity of valuable liquid out of all proportion with the results. It was thought that by dissolving the iodine in ether before mixing it with the cotton a more complete state of division would be obtained, and the operation would become more rapid. But in practice this plan was found to be defective, and it was abandoned in favour of the mode of preparation previously indicated.—*Journal de Pharmacie et de Chimie.*

THE SOURCE OF THE RADIX GALANGÆ MINORIS OF PHARMACOLOGISTS.

BY H. F. HANCE, PH.D., ETC.

Whilst it is, I believe, fully established that the "Greater Galangal" is produced by *Alpinia Galanga*, L., the plant which yields the lesser kind has hitherto remained altogether doubtful, though some writers have hazarded the opinion that it is the rhizome of *A. chinensis*, Rosc. It is now more than twelve years since my attention was first drawn to the subject by my esteemed correspondent Mr. Daniel Hanbury,] who begged me, if possible, to set the question at rest.

I have never lost sight of Mr. Hanbury's wishes; but, although the drug forms a considerable article of export from Southern China,* my want of success will not seem surprising when it is borne in mind that many vegetable products shipped from Canton come from distant parts of the empire, and pass through a number of hands before they reach those of the native merchants, and that these latter are quite incapable of comprehending the interest attaching to the solution of a doubtful scientific point, or of troubling themselves about what seem to them matters of aimless and puerile curiosity. Those who have tried know well how difficult it is to get reliable information from the natives, who will frequently invent answers rather than seem ignorant, and are especially prone to reply in the affirmative to direct or leading questions, as if they supposed the object of an inquirer was rather to obtain the confirmation of his own views than to elicit the truth.

In November, 1867, I had the opportunity of making a visit—at the invitation of, and in company with, the Commissioner of Maritime Customs at Canton—to the Island of Haenan. During this excursion, and while at anchor off Pak-shá, a fishing-village on the south coast of Kwangtung, about seventeen miles from, and rather to the east of Hoi-haú, on the north coast of Haenan, we landed, and some of the party went about six miles inland to a ruinous walled city named Hoi-on; but, being slightly indisposed, I preferred botanizing over the low hills near the coast. On their return, Mr. Sampson, who was one of the party, informed me that they had seen a large quantity of what he took for ginger (but which he described as bearing the inflorescence on the leafy stems) under cultivation; and another gentleman produced—asking if I knew what it was—some pieces of rhizome, of which quantities had been passed, exposed to the sun in shallow bamboo baskets to dry. This I immediately identified as Galangal; and as some inquiries made of a linguist who had accompanied them left no doubt that the rhizome belonged to the plant seen growing, I had the mortification of knowing that the true Galangal plant had been met with, and no specimens obtained, whilst our arrangements did not admit of further delay.

Fortunately, however, at the close of the year, another expedition to Haenan was planned; and on this occasion Mr. E. C. Taintor, an American gentleman in the service of the Imperial Customs, to whom I was indebted for the specimens of the Oaks on which the North Chinese wild silkworm is fed, respecting which I have already communicated a paper to the Society, accompanied it. Mr. Sampson took great pains to indicate to Mr. Taintor the locality where the plant had been seen; and I am happy to say that Mr. Taintor's researches were crowned with complete success, he having brought back fine living plants with the rhizomes attached, an examination of which, and comparison with authentic specimens of the drug from Mr. Hanbury and others, procured here, leave no doubt whatever of the species being the true officinal one.

The following account from Mr. Taintor's notes will explain how he obtained the plant:—"The locality is about one mile north of the small village of Tung-sai, situated upon the Bay of Pak-shá, at the southern extremity of the peninsula of Lui-chau-fú, or Lei-chau-fú, and directly opposite Hoi-haú, the port of Kiung-chau-fú in Haenan. The plant was growing at an elevation of about 100 feet above the level of the sea, in a very dry hard red soil, evidently composed of disintegrated volcanic rock. The plant grew in masses, which had been originally planted and cultivated, but were now apparently neglected and running to waste. The roots were in dense masses of sometimes more than one foot diameter, and with as many as twenty-five or thirty stalks springing from each. Rarely more than one or two of these stalks, however, bore flowers at the date of collection, January 5th. My plan, to ensure that I was getting the real plant, was to write the two characters *Liang-kiang* (*mild* or *gentle ginger*, the Chinese name), and tell an intelligent-looking villager that I wanted to see the flower. He led me, without the least hesitation, directly to the spot where I obtained the plants."

I must add that Mr. Swinhoe has since found the plant growing wild in dense jungles on the south coast of Haenan, one of his specimens being now before me, and that he has informed Mr. Hanbury, as I quite recently learnt from that gentleman, that there is good reason for believing that its fruit is the *Bitter-seeded Cardamom*, figured in Mr. Hanbury's valuable paper* "On some rare kinds of Cardamom."

In endeavouring to determine the specimens collected by Mr. Taintor, I found in my herbarium, for the purpose of comparison, only the Hongkong species of

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* Galangal is not used in British medical practice; and even on the Continent, Endlicher speaks of it as "exoleti fere usus." The following statement of the export of this drug during the last three years is compiled from the official returns published by the Foreign Inspectorate of Maritime Customs, the quantities and value being, however, for greater convenience, reduced to British weight and currency.

Years.	From Canton.		From Shanghae.		Total.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	lbs.	£. s. d.	lbs.	£. s. d.	lbs.	£. s. d.
1867	32,800	123 10 10	79,200	354 9 9	112,000	478 0 7
1868	15,233	57 10 0	162,308	1149 3 5	177,641	1206 13 5
1869	None.	......	370,800	3046 16 9	370,800	3046 16 9

From this table it would appear that the demand for Galangal is increasing; but I cannot explain why the export of a product of the extreme south of China should be transferred from Canton (the nearest port) to Shanghae, situated 80 degrees further north.

* PHARM. JOURN. Vol. XIV. p. 418, fig. 8.

Alpinia, and a few Moluccan ones, received from M. Teijsmann, of the Buitenzorg Garden; whilst, as regards books, I was restricted to Roxburgh's 'Flora Indica,' the writings of Wight and Miquel, and the very useful 'Prodromus Monographiæ Scitaminearum' of Prof. Horaninow, published at St. Petersburg in 1862. With these somewhat slender *adminicula*, I was soon satisfied that the Galangal was either referable or else very closely allied to *A. calcarata*, Rosc. (which Roxburgh states to have been introduced from China into the Calcutta garden); and though I found some discrepancies between the Kwangtung specimens and the description of *A. calcarata* drawn up from the living plant by Roxburgh,* whose accuracy is so well known, yet these were apparently so few and unimportant that my chief ground of hesitation as to their identity was the extreme improbability that the rhizome of a plant widely cultivated within the tropics, and growing and flowering luxuriantly in the Calcutta, and also, according to Thwaites,† in the Peradenia garden, should have remained for so long a period unrecognized if really the same as the Lesser Galangal of commerce.

It being evident that this question, of so much interest in itself, could not be solved with the means at hand, whilst an approximate judgment would be valueless, I determined to let the matter lie over until I had access to more complete materials.

Since then I have received, through the kindness of Mr. Hanbury, a sketch, with a single flower coloured, of the plate of *A. calcarata*, given in Roscoe's 'Scitamineæ,' and a full-coloured copy of that in the second volume of the 'Botanical Register;' whilst my ever liberal friend Dr. Thwaites has sent me living rhizomes of the same species, whence have been reared fine healthy plants, though they have not as yet flowered, and, besides, copious specimens both of the flowering plant for the herbarium, and of the dried mature rhizomes. Mr. Taintor's Galangal plants have also again blossomed under culture, but set no fruit;‡ so that *fresh* flowering specimens of *A. calcarata*, and fruit of both species being alone wanting, I may claim to have had at my disposal as good materials for comparison as ordinarily fall to the lot of a descriptive botanist. I have, to the best of my ability, made a careful and exact comparative examination of living flowerless plants of each kind (including the rhizome), and of the mature rhizome of each; whilst I have compared the fresh and also the dried flowering plant of the Galangal with separate dried flowers, as well as herbarium specimens of the entire inflorescence of *A. calcarata*. The result is, that I am now entirely satisfied that the plant which furnishes the Lesser Galangal root is, though very closely allied to *Alpinia calcarata*, Roscoe, a perfectly distinct and well-defined species, the two differing in several particulars of structure, as well as in sensible qualities, as the following brief comparative notes will show:—

Alpinia calcarata.	*Galangal.*
Dried mature rhizomes chestnut-brown,§ conspicuously furrowed longitudinally; when cut across, with a stronger odour than Galangal, the cut surface remaining of a fuscous hue; of a bitter aromatic taste, much like cardamoms, with a distinct flavour of rhubarb superadded, but destitute of heat. Sheaths and bases of the young living stems or shoots more or less tinged with pink; tasting somewhat like rhubarb, but without any hot flavour. Leaves of a full deep green; aromatic, but not hot in taste. Ligulæ 3–6 lines long, rounded or truncate, and frequently bifid at apex. Racemes compound.* Flowers with an oblong concave bractlet at their base.† Labellum "yellowish, minutely punctated with dull red, and with veins of a deep dull red colour" (Thw.),‡ its veins thickish.	Dried mature rhizomes externally rufous-brown, only very finely striated longitudinally; when cut across, surface becoming rufous; aromatic and very warm in taste, as if made up of ginger and pepper, with a recognizable camphoraceous flavour, leaving a powerful sensation of heat in the mouth when chewed.§ Bases of young shoots white; tasting very warm. Leaves of a rather lighter green; hot in taste. Ligulæ 9–15 lines long, acutish. Racemes quite simple. Flowers without a bractlet. Labellum without the slightest trace of yellow, its veins very fine.

The fruits of both species, when known, may afford other marks of distinction.

A description of the Lesser Galangal plant, for which I propose the name of *Alpinia officinarum*, drawn up very carefully from living specimens, may fitly bring these notes to a close.

ALPINIA OFFICINARUM, n. sp.; rhizomatibus longe repentibus atque intertextis cylindraceis 6–9 lineas circiter diametro rufo-brunneis glaberrimis squamis magnis pallidioribus fibrosis demum secedentibus annulosque irregulares sinuosos albidos relinquentibus copiose instructis, caulibus 2½–3½-pedalibus, foliis bifariis longe vaginantibus coriaceis glaberrimis nitidis anguste lanceolatis basi angustatis sed non petiolatis exquisite attenuatis 9–14 poll. longis medio 10–12 lin. latis ligula magna (9–15 lin. longa) oblonga scariosa erecta basi decurrente vaginas marginante apice acutiuscula auctis, racemo terminali simplici erecto densifloro brevi (plerumque haud 4-pollicari) foliis superato, rachi tenuiter tomentella, bracteis‖ spathaceis involucrantibus binis exteriore viridi nunc folio abbreviato coronata interiore alba amba-

* 'Flora Indica,' ed. Carey, vol. i. p. 69.

† Enum. Pl. Zeyl. p. 320.

‡ Zingiberaceous plants when under cultivation, even in localities where they are native, are far less disposed to fruit than the same species in a wild state, the flowers usually dropping off as soon as they fade.

§ Described by Roxburgh as somewhat woolly and pale-coloured. Dr. Thwaites and myself find them perfectly smooth, both when young and at full growth. The young fresh rhizomes of both plants are quite white and succulent; but these can scarcely be alluded to: again, some dried rhizomes kindly supplied from the Calcutta garden are cinnamon-coloured; but these are of small diameter, and evidently immature. The full-grown ones from Ceylon are, as described, of a chestnut hue externally.

* So described by Roxburgh, and so I find them in all Dr. Thwaites's specimens; but represented as simple in Wight's plate (Ic. Pl. Ind. Or. vi. 2028), and also apparently by Roscoe, and in the 'Botanical Register.'

† Described by Roxburgh as "solitary, boat-shaped, white, 1-flowered," and shown in the Bot. Reg. plate, and also (so far as I can make out from the sketch) in that in Roscoe, but omitted in Wight's figure. Quite conspicuous in all Dr. Thwaites's specimens.

‡ Roxburgh describes the labellum as "deeply coloured with dark purple veins on a yellow ground." The Bot. Reg. plate represents it as crimson in the centre, with a broad yellow border, into which veins from the centre run, though not very conspicuously; whilst my copy of Roscoe's figure gives an oblong yellow centre dotted with crimson, and a broader margin striated with red and yellow, the latter colour slightly predominating. Considering the variation in colour of the flowers of *Canna*, and the differences of shade and marking in the labella of many cultivated epiphytes of the allied Order *Orchidaceæ*, it is perhaps unsafe to attach any considerable weight to a character of this kind.

§ Cæsalpinus characterizes the rhizome very accurately, though briefly, as "subrufa intus et extra, sapore Piperis, modice odorata" (De Plant. lib. iv. c. 62).

‖ Though these exist equally in *A. calcarata*, it is curious that Roxburgh makes no allusion to them; he would have called the two an *involucre*. There is likewise no indication of them in the figures of the 'Botanical Register,' Roscoe or Wight.

bus demum extus stramineo-arefactis nitidis intra margineque scariosis cucullatis flore pluries longioribus vel simul apicibus invicem convolutis basique solutis calyptratim secedentibus vel interiore paulo serius decidua, floribus ebracteolatis arcte subsessilibus 15 lin. longis, perigonio exteriore albo tubuloso tomentello apice breviter 2–3-lobo lobis scariosis rotundatis ciliatis, perigonii interioris albi tubo extus intusque tomentello lobis oblongis obtusis cucullatis 8–11 lin. longis 2–2½ lin. latis tertio paululum majore et latiore, labello albo medio striis vinoso-rubris juxta apicem in maculam distinctam flabellatim dilatatis percurso aliisque pallidioribus a lineis medianis interioribus marginem versus pinnatim radiantibus elegantissime picto sessili ovato integro apice acutiusculo vel bilobo crispulo-eroso 10 lin. longo 8–9 lin. lato basi corniculis binis rigidulo-carnosis subulatis subreflexis 1–1½-linealibus pilis capitatis consitis basique glanduloso-incrassatis conniventibus tubum occludentibus aucto, stamine labello dimidio breviore, ovario densissime albo-tomentoso, stylo apice sensim dilatato paulo ultra antheram producto, stigmate concavo margine ciliato, glandulis epigynis ⅔-linealibus luteolis oblongis apice truncatis integris vel lobulatis.

Habitat in interioribus insulæ Haenan; vix dubie etiam in silvis australiorum imperii Sinensis provinciarum, ubi commercii ergo large colitur (Exsicc. n. 16866).

British Vice-Consulate, Whampoa,
September 1870.

HISTORICAL NOTES OF THE RADIX GALANGÆ OF PHARMACY.

BY DANIEL HANBURY, F.R.S., F.L.S.

In discovering and describing the plant which yields the *Radix Galangæ minoris* of pharmacy, Dr. Hance has added an interesting chapter to the history of a substance which for many centuries has been an object of trade between Europe and the East. Galangal does not, indeed, possess properties which can claim for it the rank of an important medicine, being simply a pungent aromatic of the nature of ginger; but it has so long held a place in the pharmacopœias of Europe, and enters into so many ancient receipts, that I need hardly apologize for offering to the Linnean Society a few notes on its pharmacological history.

Galangal was apparently unknown to the ancient Greeks and Romans; at least no mention of it can be found in the classical authors. Its introduction into Europe was due to the Arabians, in whose writings it is noticed at a very early period.

Thus Ibn Khurdádbah, an Arab geographer who served under the Khalif Mutammid, A.D. 869–885, has left some information respecting China, after which he speaks of the country of Sila, which exports . . . . musk, aloes [*i. e.* aloes-wood], camphor, ... porcelain, satin, cinnamon [cassia], and *galangal*.*

The celebrated geographer Edrisi, who wrote A.D. 1154, observes of Aden, that it is the port for Scinde, India, and China, from which last country are brought musk, aloes-wood, pepper, cardamoms, cinnamon, *galangal*, mace, myrobalans, camphor, nutmegs, cloves and cubebs.†

The Arabian physicians, from Rhazes and Alkindi in the tenth and eleventh centuries downwards, make frequent reference to galangal as an ingredient of the complicated medicines then in use.

Among the later Greeks I cannot find any mention made of this drug prior to Myrepsus, who probably resided as physician at the court of the Greek Emperors at Nicæa in the thirteenth century; though several authors declare it is referred to much earlier. It is constantly named by Actuarius, who may have been contemporary with Myrepsus.

In a work published some years ago in Paris, entitled 'Assises de Jérusalem, ou Recueil des Ouvrages de Jurisprudence composés pendant le xiii^e siècle dans les Royaumes de Jérusalem et de Chypre,' * there is a remarkable list of commodities liable to duty during the twelfth century at the port of Acon in Syria (the modern Akka), at that period a great emporium of Mediterranean trade, in which many Indian spices and drugs, including *galangal*, are enumerated.

We find galangal also noticed, together with ginger and zedoary, as productions of India imported into Palestine, by Jaques de Vitri, Bishop of Acon in the early part of the thirteenth century;† and in the 'Romance of Godefroi de Bouillon,' a poem written in the twelfth century, it is named as one of the rarities of the East, which the Crusaders were deluded into believing would be found in plenty in the Holy Land.‡

Marco Polo, in his travels in Asia in the thirteenth century, observed galangal to be produced in Southern China (Province of Foochow ?), as well as in Java.§

About this period it was also known in Western Europe. St. Hildegard, Abbess of Bingen, who died in A.D. 1179, names it as *galgan*, and comments upon its medicinal virtues.||

Galangal is catalogued with other spices (as ginger, cinnamon, cloves, and nutmegs) in the tariff of duties levied in the port of Colibre (Collioure), in Roussillon, in A.D. 1252.**

A more interesting notice of the drug is contained in the journal of expenses of John, King of France, from July 1, 1359, to July 8, 1360, during his residence in England, preserved in the 'Comptes de l'Argenterie des Rois de France.' Besides purchases of sugar, mace, ginger, cloves, pepper, cardamoms, calamus aromaticus, and many other drugs, we find three entries for *galangal*, namely, for ½ lb. 18*d.*, for 2 lb. 6*s.*, and for 1 lb. 22*d.*†† As the price of gold happens to be also mentioned in one part of the account, it is easy to form an estimate of the relative value of galangal. This shows the price of 3*s.* per pound to be equivalent to 10*s.* of our present money—not extravagant for a commodity transported from the remotest Asia to the centre of England.

In Professor J. E. Thorold Rogers's 'History of Agriculture and Prices in England,' there are eleven entries indicating the price of galangal in England between A.D. 1264 and 1376. The highest was in 1307, when 2 lb. of the spice purchased for the Crown were paid for at the rate of 6*s.* 8*d.* The other entries indicate the price as from 1*s.* 6*d.* to 3*s.* per lb.

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* "Le Livre des Routes et des Provinces, par Ibn Khordadbeh, traduit et annoté par C. Barbier de Meynard," Journ. Asiatique, sér. vi. tome v. (1865), p. 294.

† 'Géographie d'Edrisi, traduite par A. Jaubert;' Paris, 1836–40, 4to, tome i. p. 51.

* Paris, 1841–43, fol. tome ii. chap. 142.

† Vitriaco (Jac. de), 'Historia Orientalis et Occidentalis,' 1597, 8vo, p. 172.

‡ 'Bibliothèque de l'Ecole des Chartes,' tome ii. (1840–41), p. 437.

§ 'Le Livre de Marco Polo' (éd. Pauthier: Paris, 1865), pp. 522, 561.

|| 'S. Hildegardis Abbatissæ Opera omnia, accurante J. P. Migne;' Paris, 1855, p. 1134.

** Capmany, 'Memorias Historicas sobre la Marina, Comercio y Artes de la Ciudad de Barcelona,' 1779, tomo ii. p. 20.

†† The original entries are as follows:—
"Lundy VII^e jour d'octobre. Jehan Kelleshulle, espicier à St. Boutoul, pour espices prises de li pour le Roy . . . . Galingal, demie livre 18*d.* Jeudy XIII^e jour de février . . . . Galingal, 2 livres, 6*s.* Samedy XXVII^e jour de juing . . . . Berthélemi Mine, espicier . . . . Galingal, une livre, 22*d.* . . . ."
L. Douet D'Arcq, 'Comptes de l'Argenterie des Rois de France au XIV^e siècle.' Paris, 1851, 8vo, pp. 218, 232, 265, 266.

In the fifteenth century galangal was evidently in common use; for Saladinus, physician to one of the Princes of Tarentum, *circa* A.D. 1442–1458, reckons it among the things *necessaria et usitata* which should be found in the shop of every *aromatarius*.* As might be expected, it is included in all the older pharmacopœias and antidotaria.

Garcia D'Orta, first physician to the Portuguese Viceroy of India at Goa, and a resident in India for thirty years, is, I think, the first writer to point out (1563) that there are two sorts of galangal—the one, as he says, of smaller size and more potent virtues brought from China, the other a thicker and less aromatic rhizome produced in Java.†

This distinction is perfectly correct. The Greater Galangal, which is termed *Radix galangæ majoris* is yielded by *Alpinia Galanga*, Willd., a plant of Java;‡ the lesser, called *Radix galangæ minoris* or simply *Radix galangæ*, is derived as we now know, from the plant which Dr. Hance has described as *A. officinarum*. It is the latter drug alone that is at present found in European commerce.§

The name *galangal*, *galanga* or *garingal*, *Galgant* in German, is derived from the Arabic *khalanjân;* whether that word may be a corruption of the Chinese name *liang-kiang*, signifying *mild ginger*, I must leave it to others to decide.

Let me say a few words regarding the uses of galangal. As a medicine, the manifold virtues formerly ascribed to it must be ignored; the drug is an aromatic stimulant, and might take the place of ginger, as indeed it does in some countries. That it is still in use in Europe is evident from the exports from China and from the considerable parcels offered in the public drug sales of London.‖ The chief consumption, however, is not in England, but in Russia.** It is there used for a variety of purposes, as for flavouring the liqueur called *nastoika*. The drug is also employed by brewers, and to impart a pungent flavour to vinegar, a use noticed by Pomet†† so long ago as 1694. As a popular medicine and spice, it is much sold in Livonia, Esthonia, and in Central Russia; and by the Tartars it is taken with tea. It is also in requisition in Russia as a cattle medicine; and all over Europe there is a small consumption of it in regular medicine.

There is doubtless some quantity of galangal of both sorts used in India. By a 'Report on the External Commerce of the Presidency of Bombay for the year 1865–66' I find that there was imported into the port of Bombay of "*Gallingall*" from China 520 cwt., from Penang, Singapore, the Straits of Malacca, and Siam 70 cwt., and from ports in Malabar 834 cwt. Of the total quantity (1424 cwt.), 716 cwt. was reshipped to the Arabian and Persian Gulfs.¶

According to Rondot, writing in 1848, the trade in this drug is on the decline;* and the statistics which I have examined tend strongly to show that this is the fact.

The foregoing notes may be thus summarized:—

1. Galangal was noticed by the Arab geographer Ibn Khurdádbah in the ninth century as a production of the region which exports musk, camphor, and aloeswood.
2. It was used by the Arabians and later Greek physicians, and was known in Northern Europe in the twelfth century.
3. It was imported during the thirteenth century with other Eastern spices by way of Aden, the Red Sea, and Egypt, to Akka in Syria, whence it was carried to other ports of the Mediterranean.
4. Two forms of the drug were noticed by Garcia d'Orta in 1563; these are still found in commerce, and are derived respectively from *Alpinia Galanga*, Willd., and *A. officinarum*, Hance.
5. Galangal is still used throughout Europe, but is consumed most largely in Russia. It is also used in India, and is shipped to ports in the Persian Gulf and Red Sea.

* 'Compendium Aromatariorum;' Bonon. 1488, fol.

† 'Colloquios dos Simples e drogas he cousas medicinais da India;' Goa, 1563, Colloquio 24.

‡ *Maranta Galanga*, Linn. Sp. Pl. and Swartz, Obs. Bot.

§ Moodeen Sheriff, in his learned 'Supplement to the Pharmacopœia of India' (Madras, 1869), states that in the bazars of Hyderabad and in some other parts of India the rhizome of *Alpinia calcarata*, Rosc., is sold as a sort of galangal; and that a species of *Alpinia* growing in gardens about Madras, which, conceiving it to be new to science, he has described and named as *A. Khulinjan*, has a rhizome much resembling the Lesser Galangal of China.

‖ Three hundred bags, each 112 lb., imported from Whampoa were offered for sale by Messrs. Lewis and Peat, 27 Oct. 1870. The quantity was not thought remarkable; and I am assured that a single buyer will sometimes purchase such a lot at one time for shipment to the continent.

** Professor Regel, of St. Petersburg, and A. v. Bunge, of Dorpat, and Mr. Justus Eck, of London, have all obligingly supplied me with information as to the use of galangal in Russia. My thanks are also due to my friend Professor Flückiger, who on this, as on other occasions, has kindly offered me valuable suggestions.

†† 'Histoire des Drogues,' Paris, 1694, fol., part 1, p. 61.

SACCHARATED TAR, OR SOLUBLE VEGETABLE TAR.

BY M. A. ROUSSIN.

The value of vegetable tar as a therapeutic agent is generally recognized, but hitherto, in consequence of the small extent to which it is soluble in water, its use has been limited. Many attempts have been made to secure a greater solubility, but this has only been obtained by the employment of alkalis,—that is to say, by saponification. But saponification undoubtedly modifies the elements of the tar, and partly destroys its curative properties.

According to M. Adrian, "these preparations do not correspond by their chemical composition to the therapeutic properties that are expected in them," and he states that he has found alkalis, as well as acids, to modify the resinous qualities that are the basis of the medicament.

Dr. Jeannel has expressed a similar opinion. He says it is necessary that the tar should be emulsed by a neutral substance, since by so doing all the natural properties of the tar would be preserved.

Impressed with the correctness of this idea, M. Roussin sought to adapt to vegetable tar the same process by which he was able, on a former occasion to form an emulsion with balm of copaiba.† At that time he proposed to use sugar for facilitating the emulsion of copaiba in water, and as a corrective of the repulsive taste of that substance. Sugar being a neutral substance, without any chemical action capable of modifying the composition or curative properties of medicinal substances; and daily associated without hesitation with all kinds of remedies.

After several attempts this problem was resolved, and a complete solution of the vegetable tar in water obtained. The emulsion of tar was effected by triturating in a porcelain mortar, so as to obtain a homogeneous paste, purified tar, powdered sugar and powder of gum arabic. A small quantity of water was added to obtain an emulsion: it was then left to stand, and afterwards

* 'Commerce d'Exportation de la Chine;' Paris, 1848 p. 98.

† 'Annales du Comité Médical des Bouches-du-Rhône,' t. v. p. 67.

decanted. This saccharated emulsion had not the repulsive odour of the emulsion prepared with an alkali; it possessed the odour of tar, and a taste neither sharp nor bitter. It was miscible with water in all proportions, so that, by estimating the quantity of tar present, a solution might be prepared instantaneously, containing any required quantity of the active principle.

But the liquid form of the medicament presenting many and serious inconveniences, it appeared to M. Roussin that the pulverulent form, with all its practical advantages, would be very desirable. He therefore pursued his researches until he succeeded in obtaining a saccharate, as a yellow powder only differing from sugar in appearance by its colour, and exhaling the balsamic odour of tar. This preparation constitutes a remedy essentially new in form, and appears to be the real and complete solution of the problem of Dr. Jeannel.

The saccharate of tar is constant in its composition. It contains 4 per cent. of purified vegetable tar. A teaspoonful (5 grammes) thus represents 20 centigrammes of tar, and will suffice for the preparation of a litre of water.

According to M. Bouchardat, 30 grammes of tar-water contain nearly 1 centigramme of the principles of the tar in solution. This would be nearly 30 centigrammes to the litre. Soubeiran says that the proportion of matter dissolved in tar-water is so small that 100 grammes do not contain 4 centigrammes (less than 40 centigrammes the litre), and that patients can scarcely support the tar-water unless it be diluted.

The irritation of the stomach often provoked by the tar-water of the Codex is prevented by the saccharate; the proportion being but 4 per cent., the acridity of the tar is covered. Another advantage, not less important, due to its pulverulent form, is that it avoids the necessity of swallowing a large quantity of liquid, since a glass of water is sufficient to dissolve several teaspoonfuls. The physician can thus augment the quantity of tar according to the necessities of the patient.

The pulverulent form has another valuable advantage. Patients who are unable to overcome the repugnance the odour and taste of tar often provoke, may enjoy the benefits of this therapeutic agent, by making up the saccharate into a pill with unleavened bread.

Gay, speaking of the acridity and repulsive taste of oil of tar, recommended that it should be sweetened, "in order to mask its flavour and its odour." Sugar, as I have said, does not alter the therapeutic properties, but modifies its organic properties and facilitates its absorption. While retaining the odour and taste of the remedy, the saccharate so disguises them that the most delicate stomachs can bear it without repugnance.

The saccharate of tar is not the result of a chemical reaction; it is a simple mixture, each of the elements of which retains intact its composition and its properties. Constant in its composition, it will furnish solutions really and mathematically entitled to the name, being able to fulfil all the conditions necessary for mixtures, gargles, injections, etc., and enabling the physician to give his patient such quantity of tar as he may deem necessary.—*Journal de Pharmacie et de Chimie.*

The Great Glass Bottle.—It was an odd, dingy, old-fashioned shop, with huge gables and overhanging eaves—interesting, no doubt, in an antiquarian point of view, but giving the ordinary passer-by the somewhat uncomfortable sensation that in going underneath its projecting windows there was a very considerable risk of the building falling bodily upon his head. Verily, the old house had seen its best days; but still (old, dingy, and dilapidated as it was), it very well suited its occupier—Jonas Tregaskis, druggist. In those days, before "pharmaceutical chemists" were invented, men who dealt in drugs were content to call themselves druggists, adding sometimes thereto the not very euphonious or attractive title of drysalter; albeit it is possible quite as many people are poisoned by drugs now-a-days as there were then. Well, then, within the shop of Jonas Tregaskis there was the usual supply of mysterious-looking jars and gallipots labelled with odd words known only to the initiated, and sometimes it would seem not very well known even to them, such as "Galbanum," "Hydrag. s. creta," "Cap Papr.," not to mention the extraordinary-looking circles and triangles which were engraven on those that stood on the top shelf, and of which not even old Jonas himself knew the meaning. But it was not these which constituted the glory of the establishment, it was not upon these that Jonas daily cast an eye of pride and his apprentice an eye of envy. No! it was the huge red glass bottle which stood in the window and gazed like a great red eye of fire, when the lamp in the window had been lighted, upon every one that passed. Now this bottle was a new acquisition of the druggist's. He had bought it, in fact, only the month before from the widow of a respected member of his trade in an adjoining town. Well, then, the bottle had for that space stood quietly and calm in the shop window. It had not yet recovered the shock occasioned by so sudden a removal from the premises it had hitherto occupied to the somewhat dingy abode of Tregaskis; but the feelings so long pent up at last found vent, this being (so the bottle mused) somewhat as follows:—"Here's a treat, to be shut up in this nasty, dingy, little hole, with no society except those vulgar jars and gallipots! No! insufferable! insufferable!" As the bottle pronounced these words it quivered from top to bottom. "Ah!" cried the druggist, suddenly looking up, "it is as I feared; that bottle is rather top-heavy." "Well," continued the bottle, "what a view for any respectable bottle to look at! Faugh! it's enough to turn one sick; these overhanging windows, and that chandler's shop opposite, with the strings of dips in the windows. What a horribly low neighbourhood; my old master's premises were bad enough, but as to these"—here the bottle again trembled with such vehemence as to attract the druggist's attention. "Tell you what it is, Ben," said Jonas to his boy, "it's my opinion that bottle isn't safe." "Heigh ho! what a life to lead," continued the bottle, "nothing to do but to stand here all day to be looked at; even excess of admiration becomes tiresome! Therefore I am resolved to put in execution a plan which I have long contemplated; it is very evident a sedentary life does not suit me. I am convinced that I was born to be a roamer, so here goes for a start. The world and liberty for ever!" As the bottle uttered these words, whether it was that it leapt off the shelf, or whether the sudden passage of a brewer's dray at that particular moment had anything to do with it, it is impossible to say; however, the fact was that it precipitately fell headlong from the shelf, nearly frightening the druggist out of his wits, and quite frightening his apprentice out of his—at least, all he had to be frightened out of—and was broken into a hundred pieces. "Ah!" said the druggist, as he and the boy picked up the bits and wiped up the red fluid which had run out all over the floor, "it is as I feared, that bottle had not *enough bottom.*" As with bottles, so, oftentimes, with people; they talk and talk of what they mean to do, but when they pass from talk to action they invariably end in failure, they metaphysically fall to pieces, they have not *enough bottom.* Thus it is, too, one often sees shops get shut up, and the plate glass windows, once all brightly decked, get whitened over, and placarded with bills announcing "Peremptory Sale!" Afterwards the shutters go up, and whisks of straw flit vaguely round the door, and women and children weep, while wise men shake their heads and sigh; and all for the want of *bottom.*—(A Big Brother.) *The Bristol Times and Mirror.*

The Pharmaceutical Journal.

SATURDAY, SEPTEMBER 23, 1871.

Communications for this Journal, and books for review, etc., should be addressed to the Editor, 17, *Bloomsbury Square.*
Instructions from Members and Associates respecting the transmission of the Journal should be sent to Elias Bremridge, *Secretary*, 17, *Bloomsbury Square, W.C.*
Advertisements to Messrs. Churchill, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

ILLEGAL SALE OF POISONS.

The two cases reported this week in which fines have been inflicted for infringement of the provisions of the Pharmacy Act, 1868, show very well that abundant protection is afforded to the public against those who illegally sell dangerous drugs or deal in them without due care, and that it is in the power of any one to obtain the punishment of those who offend in either way.

As regards the Islington case we cannot, (taking the report as a truthful statement of it,) perceive any extenuating circumstance; and the plea urged by the defendant's solicitor that labels were not uncommonly mixed together, far from disproving neglect seems to establish it; for what is the use of a label but to indicate correctly the nature of the thing labelled? and what can be the use of a label put on without its being read at the time?

The Essex case is still more remarkable; and we cannot avoid the belief that the reporter must have strangely misinterpreted some of the magistrates' remarks. It will be seen on reference to the report that the most extraordinary confusion appears to have prevailed as to the qualifications requisite for the sale of drugs. A "licence to sell" after the manner of publicans seems to have been the dominant idea of the magistrates, and the Excise authorities were taken to be the qualifying body. But the need for a thorough knowledge of drugs and their preparation seems to have been only vaguely entertained.

We hope that the provisions of the Pharmacy Act will receive more careful consideration from magistrates, for, as we lately had occasion to remark, it is highly desirable that the law should be applied rightly as well as vigorously.

PHARMACEUTICAL PRIZES.

We notice among the announcements of vacancies connected with pharmacy one issued by the Poor Law Guardians of Manchester which seems deserving of attention now that the competence of dispensers is not only considered desirable, but even demanded as a necessity. Without commenting upon the strange confusion of duties involved in making a dispenser of medicines also the head-nurse of an infirmary, we think it worth while to quote from two other advertisements appearing side by side with that above referred to, the particulars of salaries, etc. offered by the Poor Law Guardians of Manchester and Salford as remuneration for the respective services of a cook, a horsekeeper, and a dispenser of medicines:—

Cook . . .	£20	per annum	with board, washing, and lodging.
Horsekeeper	£26	per annum	with board and lodging.
Dispenser, etc.	£30	,,	with board, lodging, and washing.

It is worthy of note that the qualification required of the dispenser is not mentioned in the Manchester advertisement, so that there is a doubt what the Guardians expect or think needful in that way. In another announcement of a similar vacancy in the Greenwich Union, however, the applicants are required to be either Licentiates of the Apothecaries' Company (*sic*) or registered under the Pharmacy Act, 1868, and in this case the remuneration offered is £80 per annum, with unfurnished rooms, coals, and gas, but no rations. Surely the responsibility attached to the duties of a dispenser has not been duly considered by the guardians in either case.

NOTES ON HERBARIA AT HOME AND ABROAD.

Some interesting details concerning home and foreign herbaria were given in Mr. Bentham's recent anniversary address to the Linnean Society, from which we gather the following. It was premised that although zoological museums are by far the more expensive, yet as exhibitions they can draw largely on the general public, whilst herbaria have to rely on science alone, which is always poor. Both, however, may claim national assistance on the plea of instruction as well as of pure science; and for practical or economic purposes the herbarium is even more necessary than the museum.

To mention our own herbaria first. The great national herbarium and library at Kew is now far ahead of all others in extent, value and practical utility. Originally created, maintained and extended by the two Hookers, father and son, their unremitting and disinterested exertions have obtained for it that Government support without which no such establishment can be really efficient; whilst their liberal and judicious management has secured for it the countenance and approbation of the numerous scientific foreigners who have visited or corresponded with it. Of the valuable botanical materials accumulated during the last century in the British Museum nothing definite can be said, the natural history portion of that collection being in a state of transition. There are also herbaria of considerable extent at the Universities of Oxford, Cambridge and Edinburgh, and at Trinity College, Dublin; and a hope is expressed that the necessity of maintaining and extending them will be recognized by those great educational bodies.

The herbarium at Melbourne, Australia, founded by FERDINAND MUELLER, has, through his indefatigable exertions, attained very large proportions; while that of the Botanical Garden of Calcutta, under the successive administrations of Dr. THOMSON and the late Dr. T. ANDERSON, has recovered in a great measure its proper position. In the United States the herbarium of ASA GRAY, recently secured to the Harvard University, now occupies a first rank.

On the Continent, of the many important private herbaria formerly existing in Paris, two only, those of JUSSIEU and A. DE SAINT-HILAIRE, had, previously to the late disastrous events, been secured for the national collection. WEBB's had gone to Florence; J. GAY's, which would have been of special value at the Jardin, was purchased by HOOKER, and presented by him to Kew. The celebrated herbarium of DELESSERT is removed to Geneva, whilst his botanical library, one of the richest in existence, is locked up within the walls of the Institut. These are but partially replaced by M. COSSON's herbarium, which has much increased of late years, and to which he added last spring the late SCHULTZ-BIPONTINUS's collection, rich in *Compositæ*. The national herbarium of the Jardin des Plantes is still one of the richest, but no longer the richest of all. The limited funds at the disposal of the administration have allowed of their making but few acquisitions, and the staff is so small and so limited in the hours of attendance that the increase of the last twenty years remains for the most part unarranged; the library, too, is very scanty.

At Geneva the Delesserian herbarium has been adequately accommodated in a building near to the natural history museum now being erected. While in Paris, it had been for some time comparatively useless, owing to an attempt to class it according to SPRENGEL's 'Linnæus;' but now an active amateur committee—Messrs. J. MUELLER, REUTER, RAPIN, and others—have already made great progress in distributing the specimens under their Natural Orders; and Geneva, already containing the important typical collection of DE CANDOLLE, and BOISSIER's stores, rich especially in Mediterranean and Oriental plants, has become one of the great centres where real botanical work can be satisfactorily carried on. At Munich, the Bavarian Government having failed to come to terms with the family of the late VON MARTIUS, his botanical library has been dispersed, and his herbarium removed to Brussels, where it is to form the nucleus of a national Belgian collection. At Vienna, the Imperial collection is admirably housed in the Botanical Garden in good order, with the advantage of a rich botanical library in the same rooms. At Berlin, where the Royal Herbarium has always been kept in excellent order, want of space is greatly complained of since it has been transported to the buildings of the University. At Florence, the difficulties with regard to the funds left by Mr. WEBB for the maintenance of his herbarium have been overcome, and it is hoped that the intentions of the testator, who made this splendid bequest for the benefit of science, will no longer remain so shamefully unfulfilled. To the above may be added Leyden, Petersburg, Stockholm, Upsala and Copenhagen, as towns possessing herbaria sufficiently important for the pursuit of systematic botany; but at the time of Mr. BENTHAM's visit, some years ago, they were all in arrears of arrangement, though in this respect they may have improved since.

THOUGH poisonous properties prevail to a great extent throughout the *Euphorbiaceæ*, many of the plants are highly valuable both for food and medicine; the seeds of many of them abound in oil more or less acrid and purging, as *Ricinus communis* and *Curcas purgans* for instance; some have the disagreeable habit of their relatives, the nettles, and are armed with powerful stings. An interesting genus on this account is *Cnidoscolus*, two species of which are formidable enemies to come in contact with. *C. quinquelobus*, better known perhaps as *Jatropha urens*, is one of these. It is a native of South America and has been in cultivation in hot-houses in this country, but the effects of its sting are so dreadful that collectors and gardeners have a wholesome dislike to it. The first sensation of a sting from this plant is a numbness, often accompanied by swelling of the lips, it frequently impedes the circulation, and in some persons produces unconsciousness for a length of time. The pain is very severe and lasts for some days; it is said that the part touched by the sting remains swollen for a length of time accompanied by a constant itching. Another species (*C. stimulans*), a native of the Southern States of North America, has palmately lobed leaves from four to six or eight inches long, covered with long, stinging hairs. The plant has received the name of "Tread-softly," on account of the stinging hairs causing much pain to the bare feet of negroes who walk inadvertently amongst the plants. The roots are said to be nutritious and used for food.

AT a recent meeting of the Massachusetts College of Pharmacy, the following gentlemen were elected honorary members:—Professor T. REDWOOD, Ph.D., Professor J. ATTFIELD, Ph.D., DANIEL HANBURY and HENRY DEANE, of London; H. B. BRADY, Newcastle-on-Tyne; Dr. H. HAGER, Berlin; Professor F. MOHR, Bonn; Dr. G. C. WITTSTEIN, Munich; Professor F. A. FLÜCKIGER, Bern; Professor DRAGENDORFF, Dorpat.

Proceedings of Scientific Societies.

SOCIETY OF ARTS.

Boiled Oils and Varnishes.

BY CHARLES W. VINCENT, ESQ.

My chief desire on the present occasion is to render as complete an account of the process of oil-boiling by steam as I can, without committing any breach of confidence towards those for whom I have been professionally engaged. A certain amount of reticence is necessitated by this latter consideration, but, at the outset, I may state that it applies only to the particular substances used to give the necessary drying or solidifying qualities to boiled linseed oil, and hence technically termed driers. The process itself may be used with any of the substances commonly employed in boiling oil by fire for the same purpose. The apparatus employed and *modus operandi* being well known throughout the trade, I am rather benefiting than injuring the cause of the manufacturers by publishing an account of the present state of a mode of manufacture which must eventually become the principal source of boiled oil.

The first consideration which presents itself to a practical man on approaching a subject which he wishes thoroughly to master and understand is, What do I want to do? the second being, How can I do it? Viewed in this way, it became evident to those engaged in this research that oil-boiling might be reduced to a much more simple and perfect operation than that ordinarily pursued.

The principal worker who has published the result of his researches is M. E. Chevreul, who, in 1856, in an admirable paper in the *Annales de Chimie*, definitely pointed out that the act of drying of linseed oil is one of absorption of oxygen, and consequently might more properly be termed solidification than drying (we will, however, retain the accustomed term); next, that many driers act catalytically; and lastly, that too long boiling retarded the drying of the oil. For instance, oil boiled three hours without driers, and afterwards three hours with litharge, dried more slowly than the same oil boiled for three hours with litharge, without any previous heating.

To whom the next discovery is due, viz. that the high temperature attained in oil-boiling by fire, is unnecessary I do not know. I discovered the fact for myself in 1859–60, when engaged in a research for Messrs. Leighton Brothers, of the *Illustrated London News*, on varnishes for printing inks; and at that time I introduced a mode of steam oil-boiling and varnish making which is still carried out by some of the largest makers of printing inks and those kinds of varnishes. The fact is now very generally accepted, though some manufacturers still hold aloof.

There are reasons which interfere with, and which stop the progress of many arts and inventions, though against reason, and the oil trade is not free from these drawbacks. A principal one is, that the manufacturers are in a great measure tied down by the wishes and desires of their customers, so that in many cases they have to produce rather what the consumers think they require than what they really need. It is this multiplicity of objects which causes the great variety of modes of manufacture of linseed oil for painting purposes. It is a common case to find that what one person, a large consumer, calls a thoroughly good boiled-oil, his neighbour, an equally large consumer, will pronounce entirely unfit for use. Now, it is my earnest wish that, as far as possible, you should hold yourselves free from preconceived notions of what constitutes a good boiled-oil or varnish conventionally, and, considering merely the uses to which they are required to be put, reflect how far these requirements are met. My own personal experience has placed certain points before me as of paramount importance, and to these I shall direct your attention. Those characteristics which may be essential to the good quality of one mode of boiling oil, but do not forward results produced when these articles are applied to their various uses, I shall neglect.

Before entering upon my subject, I must remark that no paper read before the Society of Arts on oil-boiling and varnish-making can be complete and appropriate without at least some allusion to that communication on the subject presented by Mr. J. Wilson Neil, for which the Isis Gold Medal was awarded to him in the session 1832–3 of the Society, which was published in the 'Transactions,' vol. xlix. part 2. It is not within the scope of the present paper to treat of the modes of manipulation, recipes, and precautions which he there so fully, carefully, and, indeed, conscientiously describes; but the fact remains that that paper was the foundation, and remains so to this day, of all the published accounts of modes of manufacturing varnishes. The alterations and modifications which have been from time to time worked out, are more in the shape of mechanical appliances for facilitating rapidity, easing labour and providing greater safeguards against fire, than improvements of process. The principle of manufacture remains the same, and the varnishes now made cannot be said to be better in quality, though they may be made at a less cost, and in shorter time, than those produced under the processes detailed by Mr. Neil. Many firms still retain modes of operation almost (in some cases quite) identical with those he describes. The paper is still of such value that the Society would, even now, confer a benefit on the trade were they to republish it.

For a process of oil-boiling by fire, Mr. Neil's is nearly perfect; the new process depends on principles entirely different from those he dealt with, and therefore it is necessary to begin the subject, as it were, *de novo*. Linseed-oil is boiled for two reasons, as you all know; firstly, in order to facilitate its drying when spread on thin surfaces, either alone or mixed with paint; secondly, that it may serve as a vehicle for the mechanical suspension of the finely-divided particles constituting a paint; that it may give a certain cohesive power to the mixed paint so constituted, enabling it to adhere to the surfaces on which it is spread, neither running into drops, nor leaving the colouring matters behind, but carrying the whole of the colour evenly diffused through it over the whole surface upon which the paint is laid, and, when dry, forming together a surface which is, as far as may be, impermeable to gases and liquids. Technically, these are the two qualities which consumers rightly agree in desiring in boiled oil,—that it should be a quick-drying oil, and have a good body. But it is frequently the case—and, in my opinion, they err in so doing—that consumers require in boiled oil, besides these two essential qualities, others in reality quite adventitious, to which, either from experience of some particular sample, from the custom of their trade, or from the mode in which they have been led to believe good boiled oil alone can be made, they attach a fictitious importance. It is of every-day occurrence that, unless the oil complies with these artificial demands, it is unhesitatingly condemned, independently of the two essentials upon which all are agreed. For instance, some persons attach the idea of a particular smell to be a good sample of boiled oil. If all were agreed as to what that smell should be, the desire would be easier to satisfy; but, taking it for granted that the smell is a guarantee that the oil has been heated for a certain time at a certain temperature, it is obvious that two samples of oil may have that odour, whilst from the different ages of the oils previous to boiling, the quality of the seed from which they were expressed, or the driers employed, their qualities of drying and body may be widely different. Other persons, again, confine in their opinion good quality to a particular shade of colour and degree of brightness. A third party requires a particular shade of colour, body and smell combined. Others quarrel with the manufacturer if he vary his standard shade of colour, smell, etc. The truth is, that these are circumstances independent of the proper treatment of the oil. The varying qualities of oil require a varied treatment to bring them to one standard of body and drying power. If these be the standards to be maintained, the others, which after all are only indications that the oil has been manufactured, are of no importance. This applies to the ordinary process of boiling oil by fire, and I do not insist but that, if a uniform quantity of oil be employed, and the same process always pursued, the colour and smell would be indications of the success of that particular process upon that particular oil; but, at the present day, the field from which you obtain linseed-oil is much wider than it was of old: you cannot always buy the oil you prefer, and, of necessity, the mode of manufacture you adopt has to some extent to vary. If once the idea be thrown over that a high temperature is essential to the preparation of a good boiled-oil, you at once obtain modifications of these peculiarities of colour and odour, though the other qualities, body and drying power, may be the same, or even increased.

With these preconceived notions it is that the new process of oil-boiling had and still has to contend, people imagining that unless the boiled-oil attains a conventional standard of appearance, it of necessity must be bad. One of the advantages of the new process is hereby much diminished, since oil-boilers have to adopt expedients to give a colour to the oil which otherwise it would not have to nearly the same extent. And to the practical man an aim has to be added which frets and annoys common sense and honesty of purpose, viz. that in addition to that of good and improved methods of manufacture, there must be sufficient similarity in appearance to accustomed samples to avoid awakening those prejudices against anything new, merely because it is new, still largely existing amongst the mechanical part of our population. It is the more to be deplored, since the colour of white zinc, delicate blues, etc., are much deteriorated by the dark oil used for mixing with them.

I discovered, in the beginning of 1860 that, with suitable driers, I could obtain an oil which, although it had never been raised above the temperature of 228° F., nevertheless had the body and the drying power of a good boiled-oil. This led me to investigate the subject further; although the trade being limited, and the persons engaged in it having acquired a certain reputation for a good merchantable article, made by processes which they have not unfrequently worked out for themselves, they have not the same incentive to seek for improvements, or even to adopt them when brought before them, as exists in many other manufacturing processes. I do not claim any merit as an originator of steam oil-boiling, for I have reason to believe that it has been practised in Germany for many years past; but, as far as I am personally concerned, I may state that all I know concerning the process I have discovered for myself, not even being aware that it was practised by others for some years subsequently to my own discovery and use of it.

Chevreul's experiments, to which I have previously alluded, form a good substratum for a disquisition on this subject. The principle being clearly laid down that it is the absorption of oxygen by linseed-oil which causes its solidification, it follows that all the substances which can be used as driers must be such as are capable of parting with oxygen or dissolving in it, and, being themselves oxidizable in combination, they in that way increase its absorptive power. There is a class of driers which act whilst mechanically suspended in the oil, as white copperas, etc., for example, increasing its absorptive power by their presence, but leaving no increase of drying power when withdrawn.

The substances which act catalytically belong, in my opinion, to the first class. They part with some of their oxygen to this oil, become to a certain extent deoxidized, and again coming in contact with air, they reassume their primal condition, and are ready to do the same work over again. It is this necessity of reoxidation which caused the introduction of blowing-machines for oil-boiling, when their own proper advantages in rapidly giving body to linseed-oil at comparatively low temperatures were at once, and to me unexpectedly, made manifest. These catalytic driers are now generally adopted, the effect of their use being simply this (and you will see that the result is a great advance upon previous methods), that by treating the oil with these driers under the influence of heat and air, its own absorptive powers for oxygen are greatly increased, and remain so when the primary incentives to absorption are removed. This likewise has to be borne in mind, that what we want to do is not to render the oil solid or partially so now, but to enable it to become so when exposed to the air.

Many years ago, the late Professor Faraday was consulted as to the possibility of hastening the drying of printing inks, so that work might be milled (that is, compressed between zinc plates passed through closely-set rollers) with less delay after printing. A fortnight was the usual time taken, and, if ordinary driers were used, the whole of the ink would skin on the rollers, with many other inconveniences. Faraday's far-sighted sagacity at once decided that one solution of the difficulty would be by the mechanical introduction of a substance to act as a drier which should be inert till it was exposed to the air. As Professor Faraday's advice and assistance, in a research on the same subject for the same firm was of material service to me, and, indeed, enabled me to supersede the drier in question, I break no confidence by stating that it was binoxide of manganese which almost without experiment he at once pitched upon. By what process of thought he chose this substance I do not know, but the fact remains that he did so introduce it, and for, I think, between thirty and forty years it was used by the same firm. At the Queen's Bible office they mill their work three days after printing, if it prove necessary. In order to get the binoxide in a state of division sufficiently fine to mix with printing-ink, he devised a series of washing receptacles, like successive stairs, the finer particles passing on to the lower vessels, being longer suspended than the coarser—a simple yet ingenious arrangement, which enabled the ink to be worked without any risk to the plates or formes from grit.

By properly pursuing this investigation, many other substances have been discovered which exercise this property in a high degree. Without becoming in any way altered, they induce an alteration in the linseed-oil subjected to their operation. We may imagine the action as similar to that by which spongy platinum explodes a mixture of oxygen and hydrogen, or a platinum wire is kept red-hot by the vapour of ether.

Litharge and the other salts of lead perform the same office whilst in solution in the oil, and to their presence, for the most part, is the dark colour of boiled oil due. Where the steam process is used, the oil never reaches a sufficiently high temperature to produce carbonization. By judiciously mixing one of the substances acting catalytically and a lead salt, a drier is obtained, by altering the relative proportions of which the boiler is enabled to produce any required shade of colour. The larger the quantity of litharge, the darker the colour of the boiled oil. A lesser proportion of litharge, accompanied by a greater quantity of the catalytic drier, gives as the product an oil which will dry in the same time, and has less colour. These are the principles of oil-boiling by steam.

The risk of boiling over, and being the cause of a conflagration, was one reason for the distance at which oil-boiling businesses were formerly kept from towns; the abominable smell produced by the evaporation and partial decomposition of the oil was another. Nevertheless, it is not convenient, in the extension of businesses of a disagreeable character, to be constantly driven from the centres of industry, where their articles of manufacture have ultimately to be used, and this has been particularly the case with the oil trade. In a place like London, a very large part of the consumption of boiled oil must be local; or if the oil be exported, it is the same thing as far as the manufacturer is concerned, each mile he is driven away from his customer decreasing his profits without any corresponding advantage. It became, therefore, a matter of absolute necessity that means should be taken to stop the intensely disagreeable smells arising from oil-boiling, tainting, and poisoning the air of the surrounding neighbourhood. This has been arrived at in a perfect manner, as an adjunct of the steam process.

The best form of pan for oil-boiling is made of copper, on account of its conducting heat better—an iron one will give equally good results, a little more time being, however, required—circular in shape, with a depth about equal to its diameter, and a rounded bottom. This pan is surrounded for half its depth with an iron jacket, between which and its body steam is admitted as the source of heat.

(*To be continued.*)

Parliamentary and Law Proceedings.

The Serious Charge against a Chemist at Rotherham.

At the Rotherham police court on Thursday, before G. W. Chambers, Esq., and H. Jubb, Esq., Mr. William Collinson, chemist and druggist, Masbro' Bridge, Rotherham, was brought up in custody charged, "that he did use a certain instrument with intent to procure miscarriage to a certain woman, named Eliza Uttley," twenty-seven years of age, daughter of Samson Uttley, living near Greasborough. Rumours concerning the circumstances of the case had got noised abroad, and as the prisoner has occupied a very respectable position in the town, and was well known, the court was crowded. Mr. Edwards was the solicitor for the prosecution, and Mr. Whitfield defended the prisoner.

Mr. Edwards expressed very great regret that he had to appear to prosecute the prisoner, who had for a long period occupied a respectable position in the town. No one would be more glad than himself if the prisoner should be able to clear the stain from his character which the charge implied, but he was afraid, from the conclusiveness of the testimony it would be his duty to lay before the bench, the prisoner would be unable to do so. What he then proposed to do was to place before them evidence as to the death of the girl, Eliza Uttley, who, he had been informed, had died that morning about four o'clock, and to show that her death had been caused by the use of an instrument by the prisoner to procure abortion. From a declaration which had been made by the girl before her death, they would see that the facts lay in very small compass. It would seem that the girl was in the family-way, as she alleged, by the prisoner, and that knowing her condition, she went to him and told him. He advised her to get rid of the child, and she consented that instruments should be used to procure abortion. She was prematurely delivered of a dead child, and the poor girl herself had also died. If he proved to them some of those statements, it would be quite sufficient to warrant them in remanding the prisoner. The inquest, he was told, would be held on the following day.

Samson Uttley, of Greasborough, the father of the deceased, was then called. He stated that he had a daughter named Eliza. She died at half-past four o'clock that morning.

James Edward Long, doctor of medicine, Park Gate, was then examined. He said: I was called in to attend the deceased on Sunday night last about nine o'clock. I had not previously known her. She was then in bed at Westfield House, which lies between Rawmarsh and Greasborough. I examined her and found she was suffering from peritonitis, that is to say, from inflammation of the membrane lining the cavity of the abdomen. I cannot explain what the cause of this inflammation was. It would be impossible to give any explanation now other than mere supposition. I found nothing in the womb. I examined her rather casually, because she was suffering very great pain, and I considered it would not be wise to make a minute examination, as it would materially add to her sufferings. I, however, intended to examine her the next day, and accordingly I went and saw her early on the following morning, and examined her more closely. From the appearance of the womb I suspected she had had a miscarriage and that peritonitis was resulting from it. I have seen this morning a fœtus which has been found by Mr. Horne, and my opinion, after a minute examination is, that it is of quite five months' growth. Whose child it is I do not know.

Cross-examined by Mr. Whitfield: Peritonitis may arise from a variety of causes, and might ensue after an ordinary confinement under certain circumstances. So far as I can judge, she died from peritonitis. I have examined the fœtus. It is not in my charge, but is in the hands of the police. When I examined it I did not observe anything special about it. It was then scarcely in a state to be minutely examined, but it will be examined hereafter.

Mr. Edwards: I propose now just to put in the declaration by the deceased, taken before Mr. Jubb while she was in the immediate prospect of death.

Mr. Whitfield: I have no objection to its being put in, if you put it in properly—in the ordinary way.

Henry Jubb, Esq., Justice of the Peace for the West Riding of Yorkshire, was then sworn. The declaration alluded to by Mr. Edwards was placed in his hand, and he then said: This is the declaration of Eliza Uttley, which I took on the 12th instant, in the capacity of magistrate.

Mr. Edwards: Did she make the declaration while in the expectation of immediate death?

Mr. Whitfield: How can Mr. Jubb say?

Witness: The document will speak for itself.

Dr. Long, recalled, examined by Mr. Edwards: At the time the declaration was taken the woman herself expected death.

Mr. Whitfield: I see that is stated in the declaration here. You need not go on.

Mr. Edwards: I thought you wanted the making of the declaration proved.

Mr. Whitfield: I wanted it putting in properly.

Mr. Jubb, cross-examined by Mr. Whitfield: The declaration was not made upon oath. Mr. Oxley, Dr. Long and myself were present when the declaration was taken. This declaration was made by the girl in answer to questions put by Mr. Oxley.

Mr. Whitfield here requested that this statement might be taken down in writing. The depositions were not being taken now, but he considered it to be of some importance that the statement should be put in writing. This procedure was not usual in ordinary cases, but in extraordinary cases like the present one he thought it ought to be done, seeing that the statement was considered to be of an important character.

The Chairman ruled that as the depositions were not being taken, Mr. Whitfield was out of order in asking that the statement should be taken down.

Mr. Whitfield: I have no doubt the statement is of the utmost importance, and, that being the case, I think it should be on record.

Mr. Edwards submitted that it was quite unnecessary that any statement should be taken in writing then. Suppose he put it to them this way: That in consequence of the absence of material witnesses he was unable to go on with the case. They would then have it in their power to remand the prisoner.

Mr. Whitfield: Well, I do not see any objection to your application.

Mr. Jubb, cross-examined by Mr. Whitfield, continued: Mr. Oxley asked the girl the questions, and I wrote down the answers.

Mr. Whitfield: I, of course, can have no possible objection to the present application for a remand in this case, but it must be understood that there are very grave objections to the admissibility of this document, and it will be my duty when the proper time comes to submit that this document is not admissible in evidence. However, it is not necessary for me to do so now. Only let the remand be for as short a period as possible.

Mr. Edwards: Monday will do.

Mr. Whitfield: Will you be disposed to admit the prisoner to bail?

The Chairman: No, we cannot do so at present.

Mr. Whitfield: After the inquest I will renew my application.

The Chairman: Of course you can do so.

Mr. Jubb, recalled by Mr. Whitfield: The accused was not present at the time when the declaration was made.

The Chairman (to prisoner): You stand remanded until Monday.

The majority of the spectators then left the court.

The declaration referred to in the above discussion, though put in as evidence, was not read publicly.

On Friday, September 15th, at noon, an inquest touching the death of Eliza Utley, aged 26, the daughter of Mr. Samson Utley, of Westfield House, Redhill, Greasbro', was opened at the house of the father of the deceased by J. Webster, Esq., district coroner. The death of the deceased was alleged to have been caused by the use, by William Collinson, chemist and druggist, Masbro', of an instrument to procure abortion.

Mr. Edwards watched the proceedings for the prosecution, and Mr. Whitfield attended to watch the case on behalf of the prisoner, who was not present at the investigation.

On Thursday last a *post-mortem* examination of the body was made by Mr. Knight, surgeon, Rotherham; Dr. J. C. Hall, Sheffield; Dr. J. E. Long, of Parkgate; and Dr. Moore, Mr. Knight's assistant.

Mr. Henry John Knight, surgeon, was the first witness called, and gave evidence to the effect that he, in conjunction with the above-named medical gentlemen, had made a *post-mortem* examination of the body of the deceased. He described minutely the appearance presented by the abdomen and other parts. The body was well nourished, but presented indications that the deceased was far advanced in pregnancy. Further investigations showed that there was acute inflammation of the peritoneum, and that the adjacent organs were in an abnormal state, and contained a quantity of watery pus. Mr. Knight then described in detail his examination of those parts of the body the condition of which bore more immediately on the subject of the inquiry. He attributed death to peritonitis, or inflammation of the covering of the abdomen, but declined to swear positively to the immediate cause.

Examined by Mr. Edwards: I am of opinion that there had been an operation. I was shown the body of a male child on Thursday. I take it to be from four and a half to five months old.

In reply to questions by Mr. Whitfield, the witness stated that under certain circumstances indications of violence might not be discovered.

By Mr. Edwards: The instrument produced might be used for other purposes.

Mr. J. E. Long, doctor of medicine, Parkgate (examined by Mr. Edwards): I was called in to see the deceased on Sunday night last, at nine o'clock. I found her suffering very severely from peritonitis. The next time I attended her was on the following (Monday) morning, and I attended her daily. She died on Thursday morning. I should be inclined to believe that she died from peritonitis, as stated by Mr. Knight. On the first occasion of my visit the deceased's mother was in the room, and she afterwards left me there along with the patient. I was with her about three minutes, when Mr. Collinson came up. That was at nine o'clock at night. He made no remarks to the deceased, but I spoke to him first. I said, "Oh, what are you here?" He said "Yes," and I got up from my seat. Mr. Collinson has previously several times practised as a medical man. I asked, "Have you seen this patient?" and he said "Yes." I asked him if he had sent her any medicine, and he said yes, some aperient mixture. He said they (the deceased's parents) sent for him on the previous night, and he saw her that morning. He said he had given her nothing else. I tasted the medicine. He then went away, saying that as I was going to attend the case he would bid me good night. In consequence of something the deceased said to me, I saw Collinson again. I asked him if he had ever seen her before the time he had stated, and he said yes, about three weeks before. I asked him if she had had any medicine, and he said yes, he thought two bottles. I then asked what was the nature of the medicine he had given, and he said each bottle contained two or three drachms of muriated tincture of iron, which is merely a tonic. I then said deceased had had a miscarriage, and he said, "I don't believe that would do it, any way." I then left him, and went to Sheffield. I had no conversation about the paternity of the child. I saw Dr. Hall in Sheffield, and made arrangements with him to attend the case. I have seen Collinson two or three times since Dr. Hall has seen the deceased, and had conversation as to the probable cause of death. I told him Dr. Hall concurred with me in my opinion as to the cause of her death. I was present when she made her declaration before the magistrate, and I went to Mr. Collinson after that. I told him nothing about her stating that he was the father of the child. I told him she made a most serious accusation against him.

In answer to the Coroner, the witness said that the reason he went to Collinson about this case was that the woman told him of it. After the prisoner had left witness on the first night he went to see her, and made a more particular examination.

Cross-examined by Mr. Whitfield: It was on the 12th instant that I told Collinson that the deceased had made the charge against him mentioned in the indictment. The instrument produced might have been used for other purposes.

Mrs. Annie Utley: I am the wife of Samson Utley, miner. The deceased was my daughter. We called her Eliza. She was twenty-six years of age, and a domestic servant. She died on Thursday morning, the 14th instant. I did not know she had had a child. She came home a fortnight to-day (Friday). I was not aware of her state. Collinson has only been to our house twice. I did not know till after she died that she had anything to do with him. I never saw Collinson in my life till he came to my house.

Cross-examined by Mr. Whitfield: Collinson first saw my daughter last Sunday. I sent for him on the previous Saturday night. My daughter was brought home in a cab from Mr. Sharp's house at Rotherham, where she had been attending Mrs. Sharp during her confinement.

Elizabeth Lockwood said: I live at Greasbro'. My father is a collier. I knew Eliza Utley. I saw her at her mother's when she was ill. She was in bed. I followed her directions in certain particulars.

By Mr. Edwards: I did not notice anything at all in it. It was dark at the time. I live with Mr. Utley as servant. I didn't know the deceased was likely to become a mother, and she never told me she was. She appeared to suffer great pain during the day.

William Horne was next called, and said: I live in Rotherham, and am inspector of police in the West Riding constabulary. On Wednesday morning last I took William Collinson into custody on a warrant, which I read to him, charging him with causing the miscarriage of a woman named Eliza Utley by unlawful means. On Thursday morning, the 14th instant, the last witness, Elizabeth Lockwood, pointed out to me an ash heap, which I caused to be emptied. I found the body of a child, and gave it to Dr. Knight.

Mr. Whitfield cross-examined the witness for the defence.

This concluded the evidence, and the coroner addressed the jury as follows:—Gentlemen of the jury, I must not conceal from you the fact that there is a dying declaration made by the woman Eliza Utley. The declaration is here, but it cannot be read, chiefly because there is no one here to prove it. But I think it is only right that you should have that declaration before you if the law will allow it. Therefore I shall adjourn this inquest, in order that I may have an opportunity of looking more fully into the law and seeing whether it can be laid before you; and if so, whether we can have witnesses present to prove that this woman made that dying declaration. We cannot do anything more to-day."

Mr. Edwards: If the jury are satisfied—

The Coroner: I shall not allow the jury to be satisfied. It is a very suspicious case, to say the least of it, and I think we should have all the evidence it is possible to get. The police have done exceedingly well to get the evidence they have in the short time they have had since this matter was brought under their notice.

Mr. Whitfield: Then I think you have got thus far—that the woman had a miscarriage, and that she died from peritonitis.

The Coroner: Yes, and also that she has had some dealings with a man named Collinson, who is charged with procuring abortion; and that I know, and you know, and other people know, that there is that dying declaration.

The inquest was then adjourned until two o'clock next Tuesday, to be resumed at the 'Flying Dutchman,' Parkgate.—*Sheffield Daily Telegraph.*

The adjourned inquest was held at Southgate on the 19th instant.

The evidence of the clerk to the Rotherham bench of magistrates and of a doctor who attended the girl was to the effect that the deceased made a declaration under the impression that she was dying. The declaration stated that she was *enceinte*, William Collinson, chemist and druggist, Rotherham, being the father of the child. She went to him at his shop, and he used an instrument to procure abortion. Subsequently she was prematurely delivered of a dead child. After a consideration of about half an hour, the jury returned a verdict of "Manslaughter." Bail was accepted by the coroner for the prisoner's appearance.—*Times.*

Serious Charge against a Grocer.

John Blowers, grocer, of Weeley, was summoned for having sold, on the 25th August, certain poison, viz. half an ounce of laudanum, the bottle not being properly labelled with the name of the article, the word "poison" and the name and address of the seller, as required by the Pharmacy Act, 1868. Defendant in the first instance pleaded Not Guilty, disputing the quantity named in the summons, but he eventually withdrew that plea.

A child, named Annie Gardener, was put into the box, and the magistrates finding she was not conversant with the nature of an oath (although eleven years of age) she was not sworn. She stated that, on the day in question, she was sent by her mistress to defendant's shop for half an ounce of syrup of poppies, and received from Mr. Blowers the liquid contained in the bottle produced.

Mr. John Tills Lines, by whom the information was laid, stated that on the day in question his wife sent the last witness for half an ounce of syrup of poppies. She returned bringing the bottle and contents produced. The drug was required for family purposes, and witness's wife intended administering a dose to an infant child, but thinking from its appearance and smell that that was not the article she sent for, and seeing a label "tincture of rhubarb" on the bottle she decided not to do so. Next morning, as two other children were suffering from diarrhœa, she decided to use the contents of the bottle for them, but her suspicions of its real nature being again aroused she showed it to witness, and he immediately recognized it as laudanum. He shortly afterwards went to defendant's house and told him of the occurrence, when the defendant said, "Well, syrup of poppies and laudanum are both the same thing, aren't they?"

Witness said, "No, of course they are not."

In answer to Mr. Foaker, defendant said he had no licence to sell drugs. He was not then aware that a certificate was necessary, but he was now. He told the girl it was poison.

The Chairman: That does not affect the case. You had no business to sell drugs without a licence. You ought also to have a book in which to enter all sales of poisons.

Mr. Foaker: The least you could have done would have been to put another label on the bottle. It might perhaps have been left about the house, and there is no telling what the consequences might have been. Mr. Foaker added that there did not seem to him to be half an ounce in the bottle. On being measured in a graduated glass brought by the defendant, it was discovered that there were only two drachms then in the bottle.

In answer to the Chairman, complainant said none had been taken out.

Colonel Hawkins: Then you did not get all you paid for. I think there's something incomprehensible in the defendant not knowing the difference between laudanum and syrup of poppies.

Defendant: That is not a true statement. I have sold drugs all my life, and have never done anything wrong.

Colonel Hawkins: You had no business to sell them at all if you are not properly certificated.

The Chairman: The Excise authorities will see after that. There is a £20 penalty.

Defendant said he had had some correspondence with the Pharmaceutical Society with reference to the case, and had promised not to offend again. He had also expressed his regret to complainant for the occurrence.

After a short consultation with his brother magistrates, the Chairman said the Bench looked upon the present case in a very serious light. They felt it their bounden duty to inflict a heavy penalty, not only for the protection of the public, but to prevent common grocers like defendant from dealing in goods of which they had not a thorough knowledge, and which were so eminently dangerous. Defendant would be fined £5 and 9*s.* expenses, or two months' hard labour.

Defendant applied for time, but, on this being refused, paid the money.—*The Essex Standard and Eastern Counties Advertiser.*

Infringement of the Pharmacy Act.

Mr. Lloyd Rayner, chemist, druggist and dentist, of 309, New North Road, Islington, was summoned by Richard Faulkner to answer the following complaint:—"For that you did, on the 9th day of August last, unlawfully sell certain poison—to wit, oxalic acid—without the cover containing the same being distinctly labelled with the name of the article and the word 'poison,' contrary to the statute."

Mr. Ricketts, solicitor, of Frederick Street, Gray's Inn Road, defended, and, on behalf of the defendant, pleaded not guilty.

These proceedings were taken under the provisions of the Pharmacy Act, 1868, and seemed to create a good deal of interest, the court being well attended by medical gentlemen and others anxious to learn the result.

The complainant deposed that he was a working shoemaker, carrying on business near the defendant. On the 9th of August last he sent his son (a boy about fourteen years of age) to the defendant's shop for one pennyworth of oxalic acid (that being a poison he used in his business for putting a bright red on the heels of ladies' boots). When the boy came back, he was surprised to find that the label on the packet was "effervescent citrate of magnesia" instead of "oxalic acid—poison." About half-past ten on the night of the same day he went to the defendant's shop, and saw the defendant, and asked him if a boy had been to his shop, and purchased one pennyworth of oxalic acid. The defendant told him that there had not; on which he handed him the packet containing the oxalic acid as he had received it from the boy, and asked him if the label with the words "effervescent citrate of magnesia" had been sent out by him. The defendant returned the packet to him, and told him that it was quite possible that some citrate of magnesia had been sold by him, and after remarking that perhaps the contents of the packet had been changed, he said, in an off-hand manner, it was a mistake likely to occur; that it was easy to make such a mistake, as the printer sent in all the labels together, and that sometimes one got mixed with the other. He told the defendant that there was a gross carelessness, and asked him if he would express regret for what had occurred, but as he would not he left the shop. He went a second time to the shop, and saw the defendant, and as the defendant would not apologize he, on public grounds, and for the protection of the public, instituted these proceedings.

Cross-examined by Mr. Ricketts: He had not taken these proceedings with the view of obtaining half the penalty. He had no idea of obtaining any pecuniary advantage from taking out this summons, nor would he have taken money to hush up these proceedings. All he wanted was for the defendant to apologize, and if that had been done by the defendant there would have been an end to the matter.

Frederick Faulkner, the son of the previous witness, deposed that he purchased the packet produced at the defendant's shop, and that he handed it to his father in the same state as he received it from the defendant.

Mr. Thomas Jones, surgeon, of 5, York Place, Islington Green, said the packet produced and its contents had been brought to him for analysis, and he had ascertained that it was oxalic acid, a poison.

In answer to Mr. Ricketts, the witness said he had made several tests, and they all showed that the poison was oxalic acid. There was not enough in the packet to poison any one.

By Mr. Cooke: There was quite enough in the packet to kill a child. Of course oxalic acid ought not to be carelessly sold.

Mr. Ricketts, on behalf of the defendant, entirely repudiated the sale of the poison, but after the sworn testimony of the complainant he was bound to admit that if it was sold at the defendant's shop, a wrong label must have been put on the packet. It was no uncommon thing for the labels to get mixed before they came into the chemist's possession; but this was not a case of neglect, for the defendant labelled everything that left his shop. His client looked at the complainant's visit to him as an attempt to extort money from him by threats, and that looked very much like a fact, for he (Mr. Ricketts) was instructed that the complainant told the defendant that he had been advised by some neighbouring—some rival—chemist to take these proceedings.

Several medical gentlemen of standing in the profession were called, who gave the defendant an excellent character for the past fourteen years, and said he was one of the most careful prescribers of medicine they had ever known.

Mr. Ricketts having remarked that citrate of magnesia and oxalic acid were very much alike, with the permission of the magistrate asked the complainant if he had not threatened to expose the defendant in the public newspapers, and was answered in the negative.

Mr. Cooke said that it was very much to be regretted that the defendant, a chemist and druggist, with such a high character as he had received, should have sent out such a poison as that of oxalic acid with a label on it that it was citrate of magnesia, and in ignorance of whether it was so or not. He should not be doing his duty if he did not inflict the highest penalty, which was £5, or in default two months' imprisonment in the House of Correction.

The fine was at once paid.—*Daily News.*

Obituary.

MR. JOHN DUNCAN.

About three o'clock on Wednesday morning, Sept. 13, Mr. John Duncan, of the firm of Messrs. Duncan and Flockhart, 52, North Bridge, and 139, Princes Street, Edinburgh, died at his house at Burnhead, Liberton. The deceased was, at the time of his death, in his ninety-second year, and had during his lifetime enjoyed the esteem of a large circle of friends. As a chemist, Mr. Duncan was widely known. Sixty years have elapsed since he first occupied the present premises of the firm on the North Bridge; and he was in business at Perth for some time before he came to Edinburgh.

VACANCIES AND APPOINTMENTS IN CONNECTION WITH PHARMACY.

The Editor will be glad to receive early notice of any vacancies of pharmaceutical offices connected with public institutions, and likewise of appointments that are made,—in order that they may be published regularly in the Journal.

VACANCIES.

Dispenser of Medicines and Head Nurse in the male infirmary of the Manchester workhouse at Crumpsall. Applicants are to be unmarried men, not less than thirty years of age; salary, £30 per annum, with board, washing and lodging. Particulars of the duties may be obtained from Mr. Wharf, Master of the Workhouse. Applications in the handwriting of the candidates, stating age and occupation, and enclosing testimonials as to character and fitness for the situation, must be sent to John Harrop, Clerk to the Guardians, at his office, New Bridge Street, Manchester, not later than 10 A.M. on Thursday, the 28th instant, marked outside "Dispenser," etc.

Dispenser at the Greenwich Union. Salary £80 per annum, with unfurnished apartments, coals, and gas, but without rations. Candidates must be between the ages of twenty-two and forty, and must be Licentiates of the Apothecaries' Company of London, or duly registered under the Pharmacy Act, 1868. Applications, accompanied by testimonials and a statement of qualifications, to be sent before Thursday the 28th, to Samuel Shaw, Clerk to the Guardians.—Union Offices, Woolwich Road, Greenwich, 7th September, 1871.

The following journals have been received:—The 'British Medical Journal,' Sept. 16; the 'Medical Times and Gazette,' Sept. 16; the 'Lancet,' Sept. 16; the 'Medical Press and Circular,' Sept. 20; 'Nature,' Sept. 14; the 'Chemical News,' Sept. 15; 'English Mechanic,' Sept. 15; 'Gardeners' Chronicle,' Sept. 16; 'Chemist and Druggist,' Sept. 15; the 'Grocer,' Sept. 16; the 'Journal of the Society of Arts,' Sept. 15; the 'Canadian Pharmaceutical Journal,' No. 2; the 'American Journal of Pharmacy,' No. 9; 'Sheffield Telegraph;' 'Rotherham and Masbro' Advertiser.'

Correspondence.

**** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

PHARMACEUTICAL NOMENCLATURE.

Sir,—Your last number contains some remarks by Mr. C. R. C. Tichborne on my recent paper "The Chemical Nomenclature of the Pharmacopœia." Mr. Tichborne concurs in nearly all I have written on the subject, and gives a support which is the more valuable, because coming from a thoughtful and zealous worker in pharmacy as well as in chemical science, one whose foresight fourteen years ago detected the importance of the ideas embodied in modern chemical notation and nomenclature; on a single point my friend seems to differ from me. He appears to dissent from my proposition that "the time has come when, by making a few slight alterations in the terminal syllables of some of our chemical names, we shall have a system of pharmaceutical nomenclature which, while perfectly harmonious with, is quite independent of, scientific chemical nomenclature, and which, therefore, contains greater elements of permanence than any yet adopted." He says, "A nomenclature is only a system for the conveyance of facts." It is not to be supposed that we could have two nomenclatures harmonizing equally, if at all, with facts. As well might we state that pharmacy should have an arithmetic of its own, and that 1 and 1 in mathematics should make 2, but in pharmacy they should make 3. Now, Sir, I beg to apologize to you and to him for employing the following phraseology, but, respecting this sum in simple addition, I really must ask the gentleman who signs himself C. R. C. Tichborne if he would be surprised to learn that the writer entirely agrees with him? Indeed, with regard to the matter of which this sum is an illustration, perhaps that very intelligent jury, your readers, will not be astonished when I tell them that the claimant to the above name and the undersigned entirely agree with each other. Let us see. Here are examples of the old set of names:—

THE OLD NOMENCLATURE.

Nitrate of potash.
Phosphate of soda.
Sulphate of magnesia.

These names are no longer used in chemistry, because they do not represent chemical truth so far as it is now known, and as it is now being taught to the men who will in a few short years succeed the pharmacists of the present day. Followers of modern chemistry, including Mr. Tichborne and myself, are unanimous in discarding this old system, and in following the new.

THE NEW NOMENCLATURE.

Variety 1.

Nitrate of potassium.
Phosphate of sodium.
Sulphate of magnesium.

Variety 2.

Potassium nitrate.
Sodium phosphate.
Magnesium sulphate.

Variety 3.

Potassic nitrate.
Sodic nitrate.
Magnesic sulphate.

Here is the point. What I have just called Variety 1 of the new nomenclature is alluded to in my proposition as a distinct system of pharmaceutical nomenclature,—a way of putting the matter which, I must admit, is liable to mislead, and which has misled Mr. Ince and Mr. Tichborne, and possibly other friends. From what I now write, it will be obvious that what I advocate is not one distinct system of chemical nomenclature for pharmacy and another for scientific chemistry, but that in pharmacy and medicine one of the current modifications (Variety 1) of the new chemical nomenclature should exclusively be employed,—the one supported by Mr. Tichborne.

May I be allowed to add two remarks, the one fairly pertinent, the other just a trace impertinent. The first is, that the proposed system of pharmaceutical nomenclature—or, *pace* Tichborne, the selected modification of the new chemical nomenclature—may be adopted by even the grey-haired without one backward step towards school, nay, without an effort. The second is, that the medical practitioner and the pharmacist may as well adopt the method at once, for *nolens volens* the new will certainly displace the old, and while prescriptions are written in Latin no other variety of the new is possible.

I hope you will not consider this explanation uncalled for and unworthy insertion, because, like most explanations, arguments and controversies, it ends in a mere definition of terms. I know, too, that I am riding a hobby, and trust that the nag's present healthy circulation will thereby be maintained. The proposal to adopt this form of chemical nomenclature in future editions of the Pharmacopœias of all countries has hitherto met with nothing but encouragement. I am anxious that not even an apparent objection to the system should remain unanswered.

JOHN ATTFIELD.

THE COUNCIL OF THE NORTH BRITISH BRANCH OF THE PHARMACEUTICAL SOCIETY.

Sir,—Mr. Fairlie writes in his last letter, "Having hitherto received nothing but kindness at the hands of our Edinburgh brethren, we only wish that good feeling will continue to be reciprocated between us."

This is in strange antagonism with Mr. Fairlie's ungenerous attack upon those from whom he has received "nothing but kindness," and who have had the most harmonious intercourse hitherto with our friends in Glasgow, not only with those who have attended our meetings, but also with those who have been unable to attend.

Mr. Fairlie implies, if he does not absolutely assert, that the members of Council of the North British Branch are personally benefited by the money obtained from London for the necessary expenditure connected therewith. Having so recently become a member, Mr. Fairlie is probably not aware that for twenty-eight years Mr. John Mackay gave an amount of time and thought in the interest of the Society as Honorary Secretary, without receiving any remuneration whatever, thus saving the parent Society a very large sum, had a paid Secretary been employed, which must otherwise have been the case; and but for his untiring exertions in the earlier years of the Society's existence, pharmacy—in Scotland, at least—would have been in a very different condition to what it now is. Every sixpence of the very moderate amount received has been expended in the interest of the Society and, as Mr. Mackay points out, the Library and Museum (inadequate as they are) belong to the Pharmaceutical Society of Great Britain, and no member of the Council here ever received the slightest remuneration for his time and services. One and all have had but one object in view—the advancement of pharmacy throughout Scotland.

In conclusion, I cannot but regret that Mr. Fairlie was not earlier a member of the Society, when* "he would have known of many a hard-fought battle, of many an anxious hour, of difficulties to surmount, prejudices to overcome in the unflinching desire that name and position should be obtained" for pharmacy in Scotland.

Edinburgh, Sept. 13*th*, 1871. H. B. BAILDON.

Sir,—I cannot refrain from protesting, not only against the columns of our scientific Journal being taken up with such excessively personal attacks on members of our body, but more particularly that old and valued men amongst us should feel themselves called upon to spend their time and patience in inditing lengthy epistles in vindication of acts done in their official capacity, which, but for the violent tirades of some would-be agitator, should never be called in question. I am sure, Sir, you will agree with me, that it is quite time a limit should be put on the "liberty of the subject" in this matter, and enter your protest with mine in the next Journal.

WILLIAM HARTLEY.

7, *Church Street, St. Andrew's, September* 13*th*, 1871.

* See PHARM. JOURN. Vol. XI. 2nd series, p. 25.

Sir,—In the last number of your Journal, "One who has Passed" asks for information, which I will gladly give.

Until recently the Board of Examiners have had a distinct and separate set of questions printed for the Preliminary, but, with a view to render these meetings as like those in London as possible, they have lately adopted the same sheet as the Board in the metropolis. To prevent, however, a recurrence of what your correspondent has pointed out, I may here mention that it has now been arranged, on and after the 1st of January, 1872, to hold all the Preliminary Examinations in London, here and in the provinces on the same day, and submitting the same questions as in Bloomsbury Square. The effect of this will be, that in future only *four* opportunities will be given for the First or Preliminary Examination throughout the year, and these will, on every occasion, be simultaneous.

JOHN MACKAY.

Edinburgh, Sept. 18*th*, 1871.

THE CHIPPENHAM CASE.

Sir,—I am delighted at the delicate attention M. P. S. has been good enough to pay me, and for speaking in such gentle terms of my practice. In commenting upon the application of a solution of bichloride of mercury made by Dr. Meeres to the head of a little child for the cure of ringworm, M. P. S. asks, "Who amongst the trade of chemists, whether apprentice of twelve months' standing or assistant, would think, for one moment, of using a thing so powerful and caustic to the head of a child?" I am so glad to find M. P. S. has such a correct sense of the proper duties of the pharmaceutist, and such a keen appreciation of the importance of the chemist not usurping the duties of the medical practitioner. M. P. S. does not presume, does not wish in fact, to set himself up as a judge of therapeutics as against properly qualified physicians. But, Sir, unfortunately I acknowledge that I have been "ignorant enough" to make use of such "outrageously strong" applications as that employed by Dr. Meeres very freely and very frequently for thirteen or fourteen years without the shadow or vestige of a mishap or evil consequence, and only with unvarying success.

If M. P. S. will turn to either of the medical journals of last week, he will see that, without exception, they say that Dr. Meeres has been most unjustly condemned, and that the sad result of his treatment is to be attributed to an unfortunate idiosyncrasy in the patient against mercury, and could not have been foreseen. M. P. S. compares a case of poisoning with a case of unforeseen accident. In the one case there was an absolute blunder; in the other, an untoward result from the use of a well-known remedy by the hands of one who had used it according to authority, and not for the first time, but as an old acquaintance. No parallel between the two cases is possible.

Before M. P. S. takes upon himself to "bell the cat" again he should be sure that she deserves it.

TILBURY FOX, M.D., F.R.C.P.

Sackville Street, W., Sept. 18*th*, 1871.

[*** We appreciate Dr. Fox's emotion at being associated ever so remotely with a case of poisoning, even under medical auspices, and we fully agree with him in thinking the jury exceeded its functions in censuring Dr. Meeres for using an application according to authority, whatever may be the value of the opinion that it could not do harm. At the same time it is evident that the application was capable of poisoning, even when so used, and though we do not endorse the parallel drawn between the Chippenham and Salcombe cases, "M. P. S." is not alone in thinking that somewhat greater care might have rendered Dr. Fox's hypothesis of "idiosyncrasy" superfluous.—ED. PHARM. JOURN.]

TINCT. KINO AND TINCT. KRAMERIÆ.

Like many others of my Pharmaceutical brethren, I have been much inconvenienced by the perverse behaviour of tincture of kino. At the time I made my last batch, now about two years ago, the idea occurred to me to use the kino in the coarsely granular state in which we receive it, instead of first powdering it; the result proved quite successful, the tincture being as fluid now as when first made. When maceration was complete, I poured off the clear tincture, washed the dregs with a little sp. vini rect. and turned the whole on to a muslin cloth, poured a little more spirit over, and gently squeezed it with the fingers, afterwards adding more spirit to make the required measure. I now discovered that each particle of the gum retained its individuality, if I may so term it, much paler in colour, slightly swollen, and in the condition of a very stiff jelly, which crumbled when rubbed between the fingers.

The batch preceding this, of which I write, was made from the same parcel of gum, but first reduced to a finer state of division; the tincture soon gelatinized and had to be thrown away. This experience, therefore, would tend to show that the state of division does influence the keeping of the tincture.

A short time since having to replenish my shop-bottle of tinct. krameriæ from the stock in the cellar, where it had reposed undisturbed for a long time, I found to my surprise that it had assumed the gelatinous condition. I never heard of such an alteration taking place in tinct. krameriæ, and cannot help thinking it unusual; perhaps some of your correspondents may be able to enlighten us?

Liverpool. J. H. HUSTWICK.

TINCTURE OF KINO.

Sir,—Referring to the notices which have recently appeared in the Journal on the gelatinization of tincture of kino, I beg to state that for several years I have added a small quantity of glycerine, and that I have found so small a quantity as 5 drms. to the pint quite sufficient to preserve it in a fluid state. This, I submit, is an excusable addition to the authorized formula, and an easy remedy.

Ludlow, September 2*nd*, 1871. GEORGE COCKING.

DRUGGISTS' PRICES.

Sir,—We read in the PHARMACEUTICAL JOURNAL about prices in the north; can they be surpassed by the following, which I am assured by a venerable clergyman to have been dispensed for *sixpence*—bottle included—by a Pharmaceutical Chemist in this town:—

℞. Potass. Bicarb. ʒij
Sp. Æth. Nit. ʒij
Tinct. Hyoscyam. ♏xviij
Tinct. Opii ♏xviij
Aquæ Puræ ad ℥vj.
Ft. mist.

High Street, Grantham. W. M. BETTS.

Registered Student.—Fresenius is most complete.

G. L. Napier.—Your suggestion is a good one, but since the case will be publicly investigated, it would be improper to interfere now.

Wm. Gill.—Communications are always acknowledged, but not necessarily for acceptance or rejection. The subject of poison bottles has, we think, been more than exhausted.

H. B. Crofts should communicate with the publishers.

Pharmaceutical Education in the Provinces.—We have received several letters on this subject, in which the want of provincial schools of pharmacy is dwelt upon or suggested, and, among others, some letters from Edinburgh complain that the prize lists of the Pharmaceutical Society contain only names of men who have studied in London, none of those who have passed the Major or Minor Examinations with honours in Scotland being represented. Our correspondents, reasonably enough, say they are not surprised that this is the case, but they justly complain that they have not the opportunities of the London students. This subject is one of especial importance at the present time, and it is only because we purpose shortly to speak of it more fully that we refrain from publishing our correspondents' letters at present.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. Wilkinson, Messrs. Kay Brothers, Mr. H. B. Croft, Mr. H. Crabb, "Scribo."

VESICATING INSECTS.

BY M. C. COOKE, M.A.

(*Continued from page* 181.)

Several species of *Mylabris* inhabit the Cape of Good Hope besides those already enumerated as common also to Asia. It is uncertain whether these or any of them are locally employed as vesicants. The following are the principal:—

M. Lavateræ, Fabr.; hairy, black; elytra shining, spot at the base, and two subequal broad bands, paled vermilion.—Billb. Mon. t. 1. f. 7. *M. pustulata*, var., Oliv. Ent. iii. t. i. f. 1 *f*; Rœm. Gen. Ins. t. 7. f. *a*.—This is a large insect, and most probably employed.

M. quadrifasciata, Thunb.; hairy, black; elytra black, with four yellowish-white bands, the second interrupted, and the third dentate.—Billb. Mon. t. 2. f. 4–8; Thunb. N. Sp. f. 18.

M. Gyllenhali, Billb.; villous, black; elytra black, with seven ochraceous spots, the last nearly at the extreme apex.—Billb. Mon. t. 2. f. 9–11. *M. variabilis*, Oliv. Ent. iii. t. 2. f. 14 *a*.

M. tripunctata, Thunb.; villous, black; elytra yellowish or flesh-coloured, with three points, an arched band behind the middle, and the apex black. —Thunb. Sp. Ins. vi. p. 112; Billb. Mon. t. iii. f. 14–16.

M. cocca, Thunb.; villous, black; elytra rugose, brick-red, with four punctate black bands, interspaces maculæform.—Thunb. N. Sp. vi. f. 11, 12; Billb. Mon. t. iv. f. 6–9.

M. capensis, Fabr.; villous, black; elytra black, with six yellow spots, that on the shoulder arcuate. —Oliv. Ent. iii. t. 2. f. 12; Billb. Mon. t. iv. f. 11; Wulf, Ins. Cap. t. i. f. 5 *a*, *b*; De Geer, Mem. vii. t. 48. f. 14.

M. undata, Thunb.; villous, black; elytra black, with two waved yellow bands, and an uncinate spot next the scutellum.—Thunb. N. Sp. vi. f. 17; Billb. Mon. t. iv. f. 16, 17. *Canth. undatofasciata*, De Geer, Mem. vii. t. 48. f. 15, 16.

M. sexdecimguttata, Thunb.; villous, black; elytra black, with eight yellowish spots, the three last confluent.—Thunb. Sp. Ins. vi. f. 20; Billb. Mon. t. v. f. i.

M. quadriguttata, Wulf; hairy, black; elytra black, with six yellowish spots, of which the two last are almost confluent.—Wulf, Ins. Cap. t. 1. f. 7 *a*, *b*; Billb. Mon. t. v. f. 3, 4.

M. decemguttata, Thunb.; villous, black; elytra black, with five rounded yellow spots, of which the one in the foremost angle is linear.—Thunb. N. Sp. vi. f. 19; Billb. Mon. t. 5. f. 5.

M. flavicornis, Fabr.; villous, black; elytra black, with three tawny bands, and two spots at the apex. —Billb. Mon. t. vi. f. 3.

M. lunata, Fabr.; villous, black; elytra black, with an ochraceous lunate spot at the base, and two bands of the same colour, narrowed towards the margin.—Oliv. Ent. iii. t. i. f. 2 *a*, *b*; Billb. Mon. t. vi. f. 4–7; Thunb. N. Sp. vi. f. 15; Pall. Icon. t. E. f. 5 *a*, *b*. *M. americana*, Herbst. Arch. t. 30. f. 5. *Meloe cichorii*, Wulf, Ins. Cap. xvii. t. i. f. 4 *a*, *b*; f. 6 *a*, *b*; f. 3 *a*, *b*.—This is another large insect available for medicinal purposes.

M. Africana, Oliv.; villous, black; elytra rather tawny, with two discoidal spots, and two in common at the suture, the base of the suture, and the apex black.—Oliv. Ent. iii. t. 2. f. 21; Billb. Mon. t. vi. f. 8. *Meloe 10-punctata*, var. *a*, Thunb. N. Sp. f. 7.

All of these possess vesicatory properties there can scarcely be any doubt, but we have not been able to learn whether any of them have been so employed. Other species occur in other parts of Africa, and elsewhere in the Old World, to which we need not specially refer, as they are rather of entomological than pharmacological interest.

Allied to *Mylabris*, and placed by entomologists in the same group, is *Cerocoma*, of which one species is employed.

SCHÆFFER'S CEROCOMA, *Cerocoma Schæfferi*, Fabr.; green, antennæ and feet yellowish.—Fabr. Syst. El. ii. p. 71; Panz. 96, f. 11; Schæff. Icon. t. 53, f. 8, 9; Moq.-Tand. Med. Zool. p. 135, fig. 33. *Meloe Schæfferi*, Linn. Syst. ed. xii. p. 681. *Cerocoma viridis*, Fourc. Ent. Par. p. 163.

This insect is from five to seven lines in length. It is minutely pubescent, and of a golden green colour; the head is small, and with the thorax of a darker colour. The antennæ and feet are tawny-yellow. The elytra are the same length as the abdomen and very flexible.

It lives on composite and umbelliferous plants in most parts of Europe, especially the south, burying itself amongst the flowers, and is an active flyer.

Moquin-Tandon includes this amongst the few vesicants enumerated by him in his medical zoology.

There are several other species belonging to the same genus found in France, Spain and the East, but their vesicatory properties have not been investigated.

Part IV. EUROPEAN CANTHARIDÆ.

The second family of vesicants contain the *Cantharidæ*, and the few European species belong to two genera, *Lydus* and *Lytta*. The former of these includes two species, both of which were at one time classed with *Mylabris*, and will now serve as a link to unite the Chinese flies and their allies to the European blistering-fly and its associates. We need not enter here upon the technical characters and distinctions of these genera.

IMMACULATE LYDUS, *Lydus Algiricus*, Mars.; subvillous, black; elytra tawny or brick-red, unspotted.—Mars. Mem. Lyons, 1858. p. 133. *Mylabris Algirica*, Fabr. Syst. El. ii. p. 28; Oliv. iii. T. i. f. 5; Billb. Mon. t. vii. f. 11. *Meloe Algirica*, Linn. S. N. xii. p. 651. *Lytta Indica*, Herbst, Arch. vi. p. 147, t. 30. f. 3.

Fig. 5.—*Lydus Algiricus.*

Head yellowish, somewhat hairy, black, punctate. Thorax scarcely longer than broad, yellowish, somewhat hairy, black, punctate. Scutellum black, punctate. Elytra more than three times as long as broad, tawny, brick-red, or pale testaceous, immaculate. Breast and abdomen black, with yellowish down punctate. Feet black, somewhat hairy.

Native of Italy and Africa. As far as we can judge this is the species which Moquin-Tandon alludes to (Med. Zool. p. 137) under the name of *Meloe Algeria*, L., which inhabits Sardinia, and which, he states, has been recommended as a vesicant. There is no doubt of its possessing vesicatory properties, and where sufficiently abundant would be no bad substitute for the green fly.

THREE-SPOTTED LYDUS, *Lydus trimaculatus*, Fabr.; black; elytra tawny, with three black spots.—Fisch. Ent. Russ. ii. t. xli. f. 5, 6; Brandt and Ratzb. ii. t. xviii. f. 16. *Mylabris trimaculata*, Billb. Monog. Myl. t. 6, f. 15. *Cantharis trimaculata*, Oliv. Ent. iii. t. 2. f. 19.

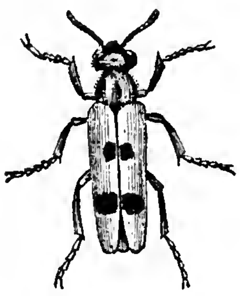


Fig. 6.—*Lydus trimaculatus.*

Head black, somewhat hairy, punctate, transversely depressed in front. Thorax somewhat hairy, black, punctate, a little longer than broad. Scutellum black, punctate. Elytra three times as long as broad, roughly punctate, with four elevated lines, tawny, the spot behind the middle discoid, or fasciate and abrupt at the suture and margin; the spot before the middle confluent at the suture, as if it were one cordate spot. Breast and abdomen black, punctate. Feet black.

Inhabits the north of Europe, where, according to Professor Westwood, it is employed as a vesicant. It is one of the species included by Brandt and Ratzeburg in their 'Medical Zoology,' though it seems to be limited in its use. This, as well as the preceding, was formerly classed with *Mylabris*, to which it is closely allied. It is the *Mylabris trimaculata* of some pharmacologists.

(*To be continued.*)

THE PROPERTIES OF INULINE.

BY DR. K. TRANTL.

The philosophical faculty of the University of Munich offered, for the year 1869–70, a prize for the best investigation on inuline, its sources, properties, and physiological value, together with a critical review and enlargement of these statements based upon original investigation. Dr. Trantl has gained the prize by an exhaustive work, a short outline of which will here suffice to draw attention to the original.

The inuline was prepared from the root of *Inula Helenium* and from the tubers of *Dahlia variabilis*, the last being easily obtainable in large quantities, and yielding a considerable percentage; the roots were coarsely powdered and heated with an equal volume of water, and a small quantity of carbonate of lime to neutralize organic acids; the extraction was repeated with fresh portions of water till the liquid did not become turbid with alcohol. The decoctions are always turbid from coagulated albumen and fragments of membrane; they are allowed to stand for some time, the liquid poured off from the sediment and evaporated till a skin is formed on the surface. In about 24 hours the liquid solidifies to a thick brown magma, and, on addition of water, the inuline separates as a yellowish-white powder, and is finally purified by dissolving it in much water, boiling with charcoal, filtering and evaporating, when it is separated as a perfectly white powder, which is dried first at 50° C., and ultimately at 120° C.

Inuline, thus prepared, consists of microscopically small globules of different sizes, without smell or taste; heated to 165° C. it becomes viscid, slightly brown, and solidifies on cooling to a gummy mass, which dissolved in cold water separates in two layers on addition of alcohol, one unchanged inuline, insoluble in alcohol, the other a yellowish-brown fluid, leaving, on evaporation, a brittle, gummy substance of very sweet taste; it is readily soluble in cold water and in alcohol, and does not reduce Fehling's copper solution. Dr. Trantl named this substance pyroinuline; Payen takes it as isomeric with inuline, as his analysis gave the formula $C_{12}H_{10}O_{10}$.

In contact with water inuline gives a milky liquid, which, on evaporation, leaves scarcely any residue; but on heating, it becomes clearer, and, according to the degree of heat, is dissolved, as shown in the following table, viz.:—

100 c. c.	saturated at	0° C.	contained	0·01	gram inuline.
,,	,,	14°	,,	0·02	,,
,,	,,	30°	,,	0·27	,,
,,	,,	60°	,,	1·57	,,
,,	,,	80°	,,	4·00	,,
,,	,,	100°	,,	36·50	,,

Inuline forms a real solution, not merely a pastelike starch, and it may be obtained from the solution in spheroidal crystals; alcohol does not dissolve it, as erroneously stated in several books, it is also insoluble in ether, bisulphide of carbon, and in essential and fatty oils.

Concentrated sulphuric acid first makes the grains transparent, and then dissolves them, and continued action carbonizes it; dilute sulphuric acid readily changes it into grape sugar.

Concentrated phosphoric acid carbonizes the inuline, and dilute acid acts similarly to dilute sulphuric acid.

Nitric acid readily dissolves inuline in the cold, but on dilution no explosive compound is precipitated as with starch.

Many other reactions are given by the author, mostly confirming previous observations of Payen, Schacht and others.

The author deduces from his investigation the final result that inuline cannot be compared with starch or cellulose, and from dextrine it differs by its stability, but it is nearest allied to cane-sugar.

Dr. Trantl comes next to the condition in which inuline exists in the root: analysis showed that the roots contained a pretty strong solution, viz. 10·7 per cent. to 77·7 per cent. of water, a concentration which cannot be obtained by a solution without separation of inuline on cooling; and after several unsuccessful experiments to explain this solubility in the plant itself, the author assumes that inuline in the cell-sap exists in a different modification which is more soluble in cold water, and which once separated goes over into the less soluble modification. The exhaustive treatise concludes with a very lengthy list of plants which contain inuline.—*Buchner's Repert. für Pharm.* 1870, ix. p. 513, and x. p. 577.

ADULTERATIONS OF BROMIDE OF POTASSIUM.

BY M. ADRIAN.

Ten samples of bromide of potassium obtained from the principal French manufacturers were analysed, and only one of them was found sufficiently pure for medicinal purposes; the others contained from 10 to 15, one sample even 35 per cent. of impurities. Similarity in form of crystallization of bromide, iodide and chloride of potassium makes a superficial inspection impossible, and one sample, remarkable for the whiteness, thickness and regularity of its crystals, was found to be extremely impure.

All samples contained moisture, from ½ to 4½ per cent., and free alkali or carbonate, from 1·5 to 4·25 per cent.; three samples contained iodide of potassium ½ to 2 per cent.; nine samples contained chloride of potassium, some 11·15 and 30 per cent., also sulphate of potash 1 to 3 per cent. Traces of bromate of potash were found in three samples, and appreciable quantities only in one. M. Adrian is of opinion that this is a very dangerous impurity, inasmuch as it may give rise to the elimination of bromine in the stomach and be the cause of violent inflammation of the bowels.

Bromide of potassium is prepared by passing chlorine through the mother-lyes of certain salt-works containing bromide of calcium and magnesium, together with iodides; the mother-lyes, coloured intensely yellow by free bromine, are shaken up with ether, the solution treated with potash, the bromate of potash which is formed, together with the bromide, is converted into bromide by ignition, dissolved in water and separated by crystallization. If chlorine is now passed through the mother-lyes, it not only replaces bromine and iodine in its compounds, but it unites with it to form chloride of bromine and iodine, which are both soluble in ether. This ethereal solution treated with potash, which frequently contains considerable quantities of chloride and sulphate, must of course yield a very impure article.

The impurities are best recognized by dissolving ten grams of the salt to 100 c. c. solution; effervescence on addition of hydrochloric acid proves the presence of carbonates; one drop of benzole and a few drops of bromine water produce a rosy colour if iodides are present; sulphate is detected by nitrate of baryta, and bromate by sulphuric acid producing a yellow coloration. After these preliminary tests and after complete separation of the carbonate, sulphate and iodide, the chloride may be determined by a standard solution of silver.—*Journ. de Pharm. et de Chim. janv.* p. 17.

PROTOPLASMIC LIFE.*

BY F. CRACE-CALVERT, F.R.S.

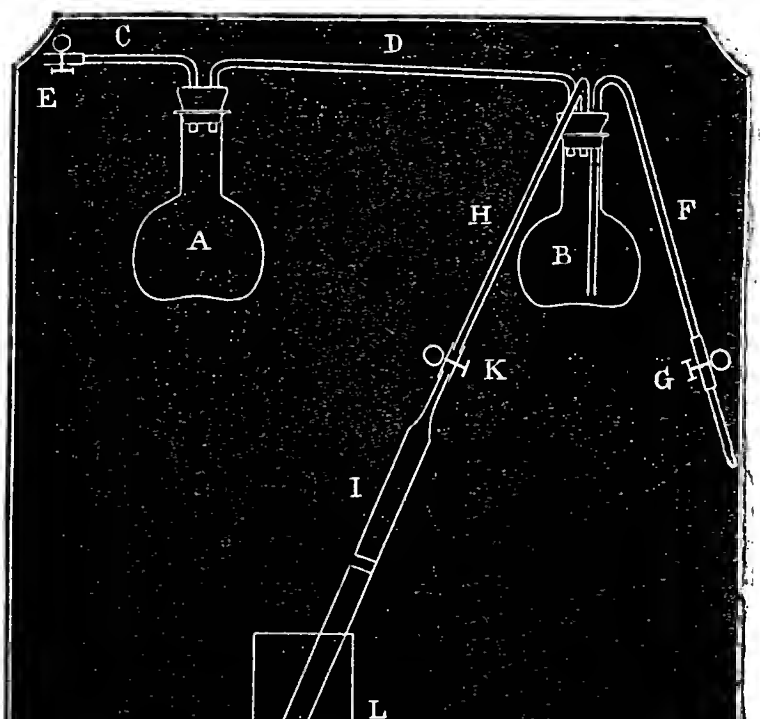
A year since, the publication of Dr. Tyndall's interesting paper on the abundance of germ-life in the atmosphere and the difficulty of destroying this life, as well as other papers published by eminent men of science, suggested the inquiry if the germs existing or produced in a liquid in a state of fermentation or of putrefaction could be conveyed to a liquid susceptible of entering into these states; and although at the present time the results of this inquiry are not sufficiently complete for publication, still I have observed some facts arising out of the subject of protoplasmic life which I wish now to lay before the Royal Society.

Although prepared, by the perusal of the papers of many workers in this field, to experience difficulties in prosecuting the study, I must confess I did not calculate on encountering so many as I met, and especially those arising from the rapid development of germ-life, and of which I have hitherto seen no notice in any papers which have come under my observation. Thus, if the white of a new-laid egg be mixed with water (free from life), and exposed to the atmosphere for only fifteen minutes in the months of August or September, it will show life in abundance. From this cause I was misled in many of my experiments, not having been sufficiently careful to avoid momentary exposure of the fluids to the atmosphere. To knowledge of this fact may be traced the erroneous conclusions arrived at by several gentlemen who had devoted their attention to the subject of spontaneous generation.

I believe that I have overcome the difficulty of the fluids under examination becoming polluted by impregnation by the protoplasmic life existing in the atmosphere, by adopting the following simple method of working.

As a pure fluid, free from life and having no chemical reaction, was essential to carrying out the investigation, I directed my attention to the preparation of pure distilled water. Having always found life in distilled water prepared by the ordinary methods, by keeping it a few days,—after many trials I employed the following apparatus, which gave very satisfactory results, as it enabled me to obtain water which remained free from life for several months.

It consists of two flasks, A and B (A rather larger than B), fitted with perforated caoutchouc stoppers.* These flasks are connected by the tube D. Into the stopper of A is fitted a tube C, to which is joined a piece of caoutchouc tubing, which may be closed by the clip E. Through the stopper of B is a siphon, F, the long limb of which is cut and joined with caoutchouc tubing, which can be closed by the clip G. Through this stopper is a third tube, H, connected by caoutchouc with



the tube I; this can be closed by the clip K. The tube I is about three feet long and goes into the vessel L, which is partly filled with water.

The water to be distilled is mixed with solution of potash and permanganate of potash and placed in the flask A.† Before distillation is commenced, a rapid current of pure hydrogen or some other gas, must be passed through the apparatus by the tube C to displace

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* From the Proceedings of the Royal Society, No. 128, 1871.

* The stoppers and caoutchouc tubing used for the various joints must be new, and must be well boiled in water before use.

† The reasons why I employed permanganate of potash (in large excess) were that, under the influence of heat, its oxidizing powers were much increased, and that it gave off no gas that could interfere with the purity of the water, this salt in solution not even yielding oxygen under any circumstances.

the air and carry off all the germs the air may have contained. The clip G is first left open, then this closed and the clip K opened, which allows the gas to through the water in the vessel L. for about fifteen

The gas should be passed closed and the distillation minutes. The clip The operation is complete, the gas carried on again passed through the apparatus, and the connection with the tube I broken by closing the clip K. The water is drawn off through the siphon F. The long tube acts as a safety-tube, and is made so long that the absorption is noticed in ample time to close the clip before any air can enter through that tube.

The water has to be redistilled three or four times before it is obtained free from germs, and must be kept in the apparatus in which it is distilled until wanted, to prevent any contact with air.

Some water which had been distilled on the 20th of November, 1870, being still free from life on the 7th of December, was introduced by the siphon H into twelve small tubes, and left exposed to the atmosphere for fifteen hours, when the tubes were closed. Every eight days some of the tubes were opened and their contents examined. On the fifteenth, therefore, the first examination was made, when no life was observed; on the twenty-third two or three other tubes were examined, and again no life was detected; whilst in the series opened on the 2nd of January, 1871 (that is to say, twenty-four days from the time the tubes were closed), two or three black vibrios were found in each field.

Being impressed with the idea that this slow and limited development of protoplasmic life might be attributed to the small amount of life existing in the atmosphere at this period of the year,* a second series of experiments was commenced on the 4th of January. The distilled water in the flask being still free from life, a certain quantity of it was put into twelve small tubes, which were placed near putrid meat at a temperature of 21° to 26° C. for two hours, and then sealed. On the 10th of the same month the contents of some of the tubes were examined, when two or three small black vibrios were observed under each field. This result shows that the fluid having been placed near a source of protoplasmic life, germs had introduced themselves in two hours in sufficient quantity for life to become visible in six days instead of twenty-four. Other tubes of this series were opened on the 17th of January, when a slight increase of life was noticed; but no further development appeared to take place after this date, as some examined on the 10th of March did not contain more life than those of the 17th of January.

This very limited amount of life suggested the idea that it might be due to the employment of perfectly pure water, and that the vibrios did not increase from want of the elements necessary for sustaining their life. I therefore commenced a third series of experiments. Before proceeding to describe this series, I would call attention to the fact that the water in the flask had remained perfectly free from life up to this time, a period of close on sixteen weeks.

On the 9th of February 100 fluid grains of albumen from a new-laid egg were introduced, as quickly as possible and with the greatest care, into 10 ounces of pure distilled water contained in the flask in which it had been condensed, and an atmosphere of hydrogen kept over it. On the 16th some of the fluid was taken out by means of the siphon H, and examined, and, no life being present, twelve tubes were filled with the fluid, exposed to the air for eight hours, and closed. On the 21st the contents of some of the tubes were examined, when a few vibrios and microzyma were distinctly seen in each field. On the 27th other tubes were examined, and showed a marked increase in the amount of life. In this series life appeared in five days, and an increase in ten, instead of requiring twenty-four days, as was the case when pure water only was employed.

Albumen therefore facilitated the development of life. Of course the contents of the flask were examined at the same time, but in no instance was life detected. I believe that these three series of experiments tend to prove the fallacy of the theory of spontaneous generation; for, if it were possible, why should not life have appeared in the pure distilled water, or in the albuminous solution, which were kept successively in the flask B, as well as in the fluids which were contained in the tubes, and had been exposed to the atmosphere or near animal matter in a state of decay, and had thus become impregnated with the germs of protoplasmic life? What gives still further interest to these experiments is, that having operated during the severe weather of last winter, when little or no life existed in the atmosphere, I was able to impregnate the fluids with germs without introducing developed life.

The quantity of life produced in the above-recited experiments being comparatively small, I was led to infer that this might be due to the influence of the atmosphere of hydrogen employed to displace the air in the apparatus used for obtaining the water. I therefore, on the 2nd of March, prepared a solution of albumen similar to that before employed, but expelled the air out of the apparatus by pure oxygen; and as the contents of the flask B were free from life on the 8th of March, a series of small tubes were filled and exposed for twenty-six hours to the atmosphere near putrid matter, and then sealed. Several of these tubes were opened on the 11th, and immediately examined, when only a few cells were observed in each field. A second lot was opened on the 14th, and they showed considerable increase of life, there being two or three vibrios under each field. A third quantity was opened on the 25th, when no increase had taken place. This latter result tends to show that, although oxygen appears to favour the development of germs, still it does not appear to favour their reproduction.

As the weather had become much warmer, and a marked increase of life in the atmosphere had taken place, some of the same albumen solution as had been employed in the above experiments was left exposed in similar tubes to its influence, when a large quantity of life was rapidly developed and continued to increase. This result appears to show that the increase of life is not due to reproduction merely, but to the introduction of fresh germs; for, excepting this fresh supply, there appears to be no reason why life should increase more rapidly in the open than in the closed tubes.

In concluding this paper I have great pleasure in recognizing the able and persevering attention with which my assistant, Mr. William Thompson, has carried out these experiments.

* During the intense cold of December and January last I found it took an exposure to the atmosphere of two days at a temperature of 12° C. before life appeared in solution of white of egg in the pure distilled water, whilst as the weather got warmer the time required became less.

GLYCERIZED COTTON FOR DRESSING WOUNDS.

Professor Gubler, at a recent meeting of the Académie de Médecine, exhibited some specimens of wadding prepared by saturating it with a certain quantity of glycerine, which he had found to render it permeable to all medicinal liquids, without causing it to lose any of its suppleness and lightness. He suggested that in this state it might prove a useful substitute for charpie, in the event of a scarcity of that article. Dr. Delaborde has already employed it with advantage. In order to prepare this dressing, it is only necessary to pour a small quantity of glycerine over the square sheet of wadding, and afterwards express it as strongly as possible.—*Journal de Pharmacie et de Chimie.*

TABLE OF REACTIONS OF DIGITALINE AND OTHER SUBSTANCES SIMILAR IN PHYSIOLOGICAL ACTION.

(*From Dragendorff's 'Untersuchungen aus dem Pharmazeutischen in Dorpat.'*)

Name.	Physiological Action.	Sulphuric Acid.	Sulphuric Acid, slightly diluted.	Sulphuric Acid and Bromine.	Proehde's reagent.	Muriatic Acid.	General Remarks.
Digitaline.	Irregularity and retardation of action of the heart; cessation mostly in the systole; no paralysis of extremities.	Green solution.	Green.	Reddish-brown; on addition of water, green.	Dark orange, red and at last greenish-brown.	Yellowish-green, then emerald green.	
Digitaleine.	Same as above.	Reddish solution.	Pale green.	Fine purple-red; on addition of water, green.	Same as above.	Greenish-brown.	
Convaleamarine.	Same as above.	Yellow solution, brownish-red, at last turning violet, starting from side of test tube.	Violet coloration at once on adding a little water to the test with sulphuric acid.	Does not turn red, or, if so, colour owing to bromine water.	Same as with sulphuric acid.	Red solution on warming.	
Helleboreine.	Cessation in the diastole, muscular action and reflex undiminished.	Almost instantly splendid red solution, gradually turning violet.	Remains red if not too much water added.	Colour produced by sulphuric acid becomes turbid by bromine.	Same as with sulphuric acid, but coloration soon fades.	Colourless solution.	
Active principle of Saponaria and Quillaya.	Cessation in the diastole, paralysis of extremities, reflex weak or not perceptible.	Brown solution, turning bluish-violet or red on exposure to air from side of test tube.	Once red or violet remains so, even with two volumes of water.	Turbid or reddish.	Same as sulphuric acid, but after a time violet not so pure.		
Senegine.	Action weaker than above, but similar.	Yellow, afterwards reddish-red, then violet and red.	Colour produced by sulphuric acid remains so, even with one volume of water.	Remains brown.	Brown, slightly violet.		
Smilacine.	Action still more gentle.	Solution brown, afterwards red.	Brown solution with sulphuric acid becomes red on adding water.	Remains brown.	Same as with sulphuric acid.	....	Insoluble in benzine.
Veratrine.	Subcutaneous injection produces tetanus.	Yellow, then brown, lastly permanently red.	A little water produced this red colour more rapidly.	Bromine rapidly produces red colour, as with above.	Red colour less pure than with sulphuric acid.	Turns red on being boiled.	Alkaline reaction.
Delphinine.	Cessation of action of heart in the diastole.	Reddish-brown.	Four volumes of water dirty light red.	Same as digitaline, but fading more rapidly.	Reddish-brown, then brown.	Colourless.	Alkaline reaction.
Antiarine.	Cessation of action of heart and of respiration.	Colourless.	Colourless.	?	?	Colourless.	
Cascarilline?	No action.	Reddish-brown.	....	Reddish-brown solution; sometimes shows violet bands.	Brown.	Colourless.	
Active principle of Dulcamara.	No action.	Yellow, then reddish.	....	....	Yellow, then reddish.	....	Alkaline reaction.
Active principle of Jalap.	No action.	Brown, then violet or red.	....	....	Same as sulphuric acid.		
Active principle of Pimento.	No action.	Brown, then bright red.	....	....	Same as sulphuric acid, but change of colour more quickly.		

DISINFECTION.*

No. I.

A disinfectant is, in the broadest acceptation of the term, anything which counteracts infectious, contagious or effete matter. How a few disinfectants produce their effects is perfectly understood, and presents no kind of mystery; how other disinfectants work is matter of dispute, and regarding the action of a good number of them we have as yet hardly arrived at the stage of controversy.

The material whose effects are to be opposed by disinfectants is held by some authorities to be animal or vegetable germs, and by others to be subtle organic poisons of surpassing power; and possibly enough may be of all these kinds, but must at any rate consist of complex organic matter. In common with all organic matter, the matter of contagion may be destroyed, and therefore rendered inoperative, by exposure to a red heat, in presence of excess of oxygen. Fire, therefore, is a disinfectant whose action is intelligible, and whose absolute efficacy is undoubted. It is one of the most ancient disinfectants, and is, for many purposes, unrivalled, and likely to remain so.

The action of destructive chemical agents, such as hot concentrated sulphuric, nitric or chromic acid, is, in like manner, quite intelligible. Disinfection by such means is perfectly certain, but it would be costly, and there are not many instances where such agents can be employed, and where fire might not be resorted to with greater economy.

We have instanced disinfectants which are effective and impracticable, in order to throw light on those which are practicable and not effective or much in vogue at the present time. Chlorine, which, in the form of bleaching powder, is much employed as a popular disinfectant, will necessarily destroy contagious matter, as it does all organic matter if suitable precautions be taken to ensure the conditions under which it can act thoroughly. But to use chlorine under these conditions is no more practicable than to use boiling concentrated nitric acid, and the manner in which chlorine is actually used, and that which alone is practicable, is not effective.

Suppose, instead of burning the clothes of the plague-stricken patient, we were to reduce them to pulp, bleach the pulp, and make paper of it, should we get plague paper from the plague rags? We cannot guarantee that we should not, but if we pushed the action of the chlorine further, destroying the pulp so that it could not make paper, and until complete chemical disintegration, then we could guarantee that it would not be infectious. If, then, there be doubt whether the paper made from some descriptions of infected rags be infectious, what shall we say of the chances of the decomposition of infectious matter by the popular expedient of just sprinkling clothes with a little bleaching liquor? Fumigations of sick-rooms with chlorine gas are not likely to be effective, for long before the proportion of chlorine in the atmosphere could reach the point at which we could hope for any attack of infectious matter existing in the atmosphere (and certainly very long before we could guarantee any attack of the infectious matter), the smell of chlorine would have become unendurable. In fine, the actual practical employment of chlorine, as a disinfectant, does not rest on a sound chemical basis, and we are not warranted in assuming that any great good is done by it.

Leaving disinfectants which aim at the chemical disintegration of infectious matter, we pass on to others, the *modus operandi* of which is in dispute. Corrosive sublimate, carbolic acid and sulphurous acid,—do they poison the germs, or are they chemically incompatible in relation to the organic poisons? We shall not discuss this question on the present occasion, but it is a fact, ascertained by experience, that these substances, in common with very many others, have some power of suspending the action of infectious matters, Of late years it has been the fashion to single out carbolic acid as pre-eminently serviceable. But Dr. Sansom, who is one of the warmest advocates of the use of carbolic acid, has shown that if we measure its activity by its power of arresting fermentation it is far behind corrosive sublimate; and if by its destructive action on low forms of animal life—on spermatozoa, infusoria and entomostraca, it comes behind corrosive sublimate and most of the commonest acids. In short, there is no reason why carbolic acid should be so singled out, whilst its being notoriously poisonous makes it no fitter for general and popular use than corrosive sublimate.

As we have said, the list of disinfectants is very wide. It includes such substances as common salt, which, according to Dr. Sansom's table, has about one-twentieth the disinfective power of carbolic acid. It appears to us that, whilst possibly all may have their uses in skilled hands, for household and popular use, we must avoid corrosive chemicals, poisonous substances, and bad-smelling things, and select agents which, having none of these properties, can be employed thoroughly and unsparingly. The property of deodorizing is also one which will be valued in a popular disinfectant, and since most of the common bad smells are stinking alkaloids, a great variety of substances, including all the acids, will possess this property.

We shall return to the subject and discuss the uses of the several disinfectants.

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THE INDIA-RUBBER OF COMMERCE, WITH REMARKS ON ITS PREPARATION.

BY JAMES COLLINS.

American Varieties.—The Brazils supply the finest rubber known to commerce as "Pará." It is obtained from different species of Seringa—*Siphonia* [*Hevea*]. The trees are very common in the Amazon districts, and Pará is the port of shipment,—hence the name. *Siphonia elastica* (or *Hevea Guayanensis*) has long been known. The rubber is obtained from the trees in the following manner:—A deep transverse cut is made through the bark near the base, then one perpendicular to near the beginning of the branches, and from this other cuts in a diagonal direction are made.

The juice flows out, of the consistency and colour of thick cream, into a basin of clay placed at the base to receive it. This cream contains about 30 per cent. of pure rubber. Clay moulds are then dipped into the crude milk, to which the rubber adheres in a thin film, and is dried over a fire made of the oily fruits of the Urucuri palm. Sulphur is also used to expedite the operation, so that vulcanization is not so new as patents would lead us to believe. The same process of dipping and drying is repeated till a sufficient thickness is attained and the moulds removed. These successive coatings give the rubber the laminated appearance which is so very noticeable in most descriptions of Brazilian rubber. In the case of Ceará rubber, the trees are incised, and the rubber allowed to dry on them, and afterwards picked off, giving the rubber a stringy character. Pará rubber is known under four forms,—1, flat pouches, or biscuit; 2, the well-known bottles: 3, negro head; and 4, "scrap." Of these, the first is the best—the last two consisting of refuse.

British and French Guiana yield but little rubber, although capable of yielding much larger quantities. It is probably obtained from the same tree as the Pará kind, but is not equal to it in quality.

Venezuela, New Granada, Ecuador, Peru, Costa Rica, Nicaragua, Salvador, Honduras, Guatemala and Mexico, all yield india-rubber in greater or less quantities, and all too obtained, there is reason to believe, from one and the same tree. This tree is called by the natives *Ule* or *Ulequahuitl*, known to botanists as *Castilloa elastica*. The varieties of this rubber known in commerce are, "West India," "Carthagena," "Nicaragua," "Honduras," "Guayaquil," "Guatemala." These varieties are here arranged according to their relative value. The rubber is collected by companies of men called *Uleros*, in the following manner:—Having selected trees, long, perpendicular incisions are made down the trunk, and on either side of it short, diagonal ones, and an iron spout is driven in at the basal end of the perpendicular channel, down which the crude milk runs into a pan holding about five gallons placed to receive it. A tree of 4 feet in diameter and about 20 to 30 feet to the first branches, yields about 20 gallons, containing about 40 lb. of pure rubber in solution. At the end of the day this milk is collected and brought to the common workshop, where it is passed through sieves to free it from pieces of bark and other impurities. In Nicaragua, the juice of the *Achuca* plant (*Ipomœa Bona-nox*) is added in the proportion of a pint to a gallon of milk. On mixing these the rubber quickly coagulates. Where this plant is not obtainable, salt water is substituted. To every gallon of milk two gallons of salt water are added. These are placed in a barrel, and allowed to stand for twelve hours. After the rubber has coagulated it is taken out, the water pressed out by the hand, and then subjected to the heaviest available pressure, either by using heavy stones, hydraulic presses or rollers. It is then hung up wet, exposed freely to the air, and loses about two-thirds of its weight. We next turn our attention to Asiatic kinds of rubber.

Malayan Archipelago.—Our chief sources of supply from this portion of the globe are Singapore, Borneo and Java. Singapore is but an *entrepôt* for the produce of neighbouring countries, native sources being long ago exhausted. Singapore (so-called) and Java rubber are obtained from fig-trees. *Ficus elastica* is the chief plant which yields it. This plant is too well known to need any description; its dark green, glossy leaves are seen everywhere, it being a great favourite as a window and greenhouse plant in this country. To obtain the india-rubber the trees are incised, and the rubber allowed to trickle down the trunk. When dry, it is collected in the form of strings, and rolled into balls or pressed into large slabs. "Borneo" rubber is collected from a trailing, vine-like plant, the *Urceola elastica* of botanists, of which there are three varieties recognized by the natives, viz. *Serapit*, *Petabo* and *Menungan*. The juice is treated with salt water, which speedily brings about the coagulation of the rubber, the outside of which being acted upon first, encloses small quantities of salt water in numerous little cells.

India.—Assam rubber is the only kind of rubber which India supplies to the English market. It also is obtained from the *Ficus elastica*, and is collected in the same manner as that of Java and Singapore.

Madagascar.—This variety, which is beginning to figure in our commerce, is obtained from a trailing, vine-like plant, called by the natives *Vaughinia* (*Vahea* sp. of botanists), by incision, and coagulation brought about by treatment with salt water or artificial heat. In the Johanna and Mohilla islands the same plant occurs.

Eastern Africa.—In the Zambesi, Zanzibar and Mozambique districts rubber plants have been found, but, with the exception of the latter, one parcel of which has been sent to England, no quantity of rubber has as yet appeared in commerce.

Southern Africa.—Efforts have been made to utilize the sap of various species of *Euphorbia*, but with no present result.

Western Africa is our chief source of commercial rubber in Africa. From the west coast rubber is obtained from climbing plants, which have jasmine-scented flowers, and stems of from 4 feet to 6 feet in diameter. They are found to be a species of *Landolphia*. The natives cut the stems, and allow the rubber to trickle down their arms, and remove it in the various forms of balls, tongues, etc.

By a careful examination of the whole subject, I have found that there are six modes of preparing rubber. These we may arrange in two groups, thus:—

Group 1.—Coagulation brought about by heat. Examples—(1) Artificial heat, ex. Brazilian, etc.; (2) Natural heat, ex. Ceará and Ficus group.

Group 2.—Coagulation brought about by the addition of various substances; (3) Alum, ex. Brazilian; (4) Certain plants, ex. Nicaragua; (5) Fresh water, ex. Nicaragua and Madagascar; (6) Salt water, ex. Borneo, Madagascar.

Of these methods, that pursued at Pará, namely, by the careful application of artificial heat, especially if aided by the use of sulphur, is undoubtedly the best, and produces the finest rubber. The preparation by natural heat has the disadvantage of requiring a second visit to the tree, whereas, as a rule, the scene of operation has to be constantly changed. Of the second group, viz. a *wet process*, in contradistinction to the first group, a *dry process*, the addition of a solution of alum is in great favour in Brazil, inasmuch as it enables the operation to be conducted in the collectors' own houses, a desideratum of great value on the score of health alone as the exhalations from the decaying vegetable matter on the river banks, which, on account of the inundations, are nothing but mud, are fruitful sources of deadly fevers. The wet process, however, has one very serious disadvantage. The rubber thus treated is never free, unless very old, from water, and dryness is next to purity in constituting value in rubber. In the Guatemala and Guayaquil rubber, a dirty, tarry, resinous matter exudes, which greatly detracts from the value, it being very difficult to get rid of. In the Borneo kind, when a piece is cut through, the water is seen in little cells, and has a very saline taste.

Purity and freedom from false packing is, as already hinted, the *first* and main point to be attended to in order to produce a good, marketable rubber. The adulteration may arise in various ways:—1st. By careless collection, in allowing bark, clay, or other materials, to fall into the milk. It is an excellent plan to pass the milk through sieves in order to separate these impurities. It is important that the *form* in which rubber is made up should not be lost sight of. Large masses *never* will fetch so high a price as small pieces, as in the latter case the facility of adulteration or false packing is reduced to a minimum. By far the best plan is to prepare the rubber in thin, separate sheets, or cakes, and if a mould is used to use wooden ones, a large-sized battledore, such as is used by children, being an excellent mould in every respect. Secondly, care should be taken not to mix the milk of another tree with that of india-rubber. Of course this caution should not deter any one from searching for such milky juices as are likely to be of use to send as samples home. Bad preparation and intentional fraud should be guarded against.

The *quality* and quantity of rubber is much influenced by the time of year at which it is collected, and these facts should be noted. The trees require, after each tapping, a period of rest of about two years. Binding the trees and overtapping injure greatly, and should be strenuously guarded against, but many interesting facts may be noted in connection with this subject, and would prove highly valuable. Total destruction of the tree is barbarous and intolerable, and should be put a stop to by all possible means. Efforts and experiments should be made in the direction of cultivation, and as to how the trees are best propagated, and how long they are before they come to maturity. As there are some, doubtless, who, from residence and other favourable circumstances, would be willing to collect a series of specimens which would enable a definite opinion to be formed of the value of the rubber, and allow some useful hints to be offered, suggestions are therefore made here only as to the *kind* of specimens, leaving it to the collector to add to the list as opportunity offers, and usefulness would suggest.

1. Samples of crude juice, without any preparation whatever, care being taken to place the same immediately in *air-tight* vessels to guard against any spontaneous change taking place. If two such specimens can be sent, to one might be added a small quantity of ammonia, as this checks coagulation. Care should be taken to exclude light.

2. Samples of rubber, prepared in as many different ways as possible, such as those enumerated, care being taken to note the time occupied. and which gives the best result in quality and quantity, a *uniform* quantity being used in each trial.

3. Samples of the whey-like substance which separates from the india-rubber during its coagulation.

4. Samples of prepared rubber in the form or forms proposed to export it in, care being taken that it is as *clean* and *dry* as possible.

5. Note the average yield of each kind of tree, and the relative yield by simple tapping; 2, tapping, aided by binding; and 3, total destruction, the best season to conduct the operation, the effect of tapping on the vitality of the trees, the period of rest required. Of course neither binding nor total destruction should be had recourse to in practice.

Specimens, illustrating such notices, would be exceedingly useful.

Our knowledge of the botanical origin of many of the milky juices needs much enlightenment; and it is highly desirable that complete series of botanical specimens should be obtained. The following is a list of specimens which should be collected in order to be as complete as possible.

1. Dried specimens of a branch, having the leaves, flowers and fruit attached. These may easily be dried between sheets of any porous paper, care being taken to change the paper a few times at first to ensure perfect dryness, and to guard against mouldiness. The specimens should be as characteristic of the tree as possible—leaves on different parts of a tree in some instances vary considerably.

2. Specimens of leaves, flowers and fruits attached, preserved in a jar or bottle, in some spirit, such as brandy, spirits of wine, or acetic acid, and tightly corked and secured to prevent leakage.

3. Specimens of the wood and bark and india-rubber gathered from the *same identical tree.*

4. Where there is more than one kind or variety of tree yielding the same substance, complete specimens of each kind or variety should be sent.

I shall be happy to receive and report on any such series of specimens, and will gladly acknowledge them in any future papers on the subject I may publish.—*S. W. Silver and Co.'s 'Colonial News,' London.*

REARING OF THE COCHINEAL INSECT IN THE CANARY ISLANDS.

In the Canary Islands the rearing of the cochineal insect, for the purpose of export, is carried on to a considerable extent, and forms the bulk of the contribution from these islands towards supplying the necessities of commerce. According to the official returns for 1869 the quantity of cochineal exported thence during that year amounted to 6,316,000 lb., the estimated value being £842,921. Of this quantity, no less than 4,232,600 lb., valued at £554,092, was exported to England. Some idea of the development of this industry may be formed from the fact that the exports, which in 1865 were under 2,400,000 lb., had increased, in 1867, to over 5,000,000 lb., and, in 1869, to 6,316,000 lb., more than half of which was exported from the island Grand Canary. In fact, cochineal rearing is so profitable and is augmenting so fast, that it attracts all the available capital in the island. A consequence of this is, that the necessaries of life, which were formerly produced in these islands in great abundance, are no longer to be obtained in sufficient quantity to meet the wants of the population, except at a greatly increased price. Steps have therefore been taken by the provincial authorities to obtain from the Spanish Government permission to import from Morocco live-stock and other articles of consumption.

A very interesting report on the method of rearing the cochineal insect in the Canary Islands has been furnished by Mr. Consul Grattan, from which we abstract the following particulars:—

The cochineal insect is a species of coccus about the size of a pea; it has a silvery grey appearance, the body being reddish-black and covered with fine white dust. When first brought forth the insect moves about freely, but as it grows it fixes itself to the leaf from which it derives its nourishment. There are several varieties of the prickly pear plant on which the cochineal feeds, but that most generally cultivated for the purpose of breeding is the common hardy *Cactus opuntii.* In a wild state this plant brings forth abundance of fruit, and it formerly supplied one of the principal articles of food to the inhabitants of the Canary Islands. The fruit is found to debilitate the plant when used for the purpose of rearing cochineal, it is therefore carefully removed as fast as it buds. The cactus plant is so hardy as to grow luxuriantly on rocky spots, where there appears to be scarcely soil enough to fill the crevices; but in this state it cannot serve for the rearing of cochineal for more than one or two seasons. In rich soil, and with abundance of manure and water, the same plants will continue to yield excellent crops for from ten to twelve years.

The best soil is that which is found in volcanic countries, where pumice stone and black scoria abound. Where no artificial irrigation can be obtained, a layer of black scoria, called here "picou," covering the ground to the depth of several inches, is found greatly to improve the plant, by retaining the moisture of the soil and protecting it from the heat of the sun, and also by preventing the growth of weeds, thereby keeping the land constantly clean. In those parts of the Canary Islands where the soil has been overrun by lava, and on which the vegetable growth is confined to lichens, mosses and here and there small ferns or weeds, the preparation of the land for the cultivation of the cactus is a long and costly process, the expense of the process varying according to the hardness of the rock, to the abundance of subsoil, and to many other circumstances. Where there is abundance of earth on the surface, and the preparation consists only in levelling the ground for the facility of planting and of irrigation, the cost is much less, but a thorough upturning and airing of the soil is found to be essential to the successful cultivation of the cactus. The cactus plant is propagated by the leaves, which are broken off sharply one at the time, and exposed to the heat of the sun for about three weeks before they are planted; if the leaf is put into the ground fresh and moist as at first gathered, it is almost sure to rot; but when allowed to dry in the sun until slightly bent, it will strike root and bud with facility. During the summer months, leaves so dried will be found to bud in ten days or a fortnight with great profusion, as many as eight or ten new leaves bursting forth at the same time. They are planted in furrows at about a yard apart, either edgeways, as close as possible, or about four inches apart if placed across the furrows. This is done in May or June; in four or five months the new leaves will have grown to their full size, and the plants will then be ready for transplanting. Here the furrows are at least two yards apart, in order to admit of a free passage to the labourers amongst the plants after they have grown to their full size; and each plant is placed half a yard from that on either side of it, to allow sufficient space for its full development, which takes place in February or March. Each leaf buds with about from five to fifteen shoots, according to the nature of the soil and to the quantity of manure and water supplied to it. In handling these plants great care is taken to avoid bruising the main trunk; if by accident the hoe should be struck against it, the only way of saving the plant is to cut out the injured piece, the fresh cut will then probably dry and the plant be none the worse; a bruise, on the contrary, gradually causes the whole trunk to become soft and putrid. A considerable quantity of ordinary manure or of guano is required to bring the plants to perfection.

Having by these means obtained by the end of May or June well-grown cactus plants, consisting of four or five branches, springing from each trunk with a good supply of rich dark-green leaves; when the fleshy spines and prickles have fallen from them, the plantation is ready to receive the insect. The state of the weather during the growth of the "madres," and the temperature at the time of spawning, has a great effect upon the amount of seedlings produced. The mothers are put into small bags made of a material called "renque" (a sort of gauze), about eight or nine inches long, and shaped somewhat like a sausage, in each of which is put about a table-spoonful of "madre," it is then hung over a leaf in the cochineal plantation. The young, as they are born, walk out of the bag on to the cactus, and spread over the surface of the leaf. The quantity of insects spawned in a given time will vary according to the heat of the weather and the age of the "madres": with fresh "madres," and in warm weather, a couple of hours will be enough to cover the leaf sufficiently; with old "madres," and in cool weather, the bags may be left on the leaves as long as thirty hours, or even two days; the leaf, on removing the bags, should be moderately and evenly covered with insects. If the insect is allowed to spawn too freely on each leaf the crop will be damaged in quality, and if the bags are removed too soon the crops will be deficient in quantity. The obtaining of a fair average number of insects on each leaf is therefore one of the most important points to be looked to in the cultivation of cochineal, and one which requires experience and constant supervision on the part of the grower.

Another way of conveying the spawn to the leaves is the following: the "madres" are spread on shallow trays about 4 or 5 inches long and 2½ inches wide; some entirely made of wood, others a framework of wood with a bottom of thin canvas, nailed on so as to prevent the escape of the young. The "madres" being laid thinly over the surface, so as to lie closely side by side, but not one over the other; pieces of rag, about half a yard long by five inches wide, are then spread over the whole surface of the tray; in a short time these become covered on the under side with the young insects, and being removed are conveyed to the plantation in baskets; they are one by one pinned on to the leaves, on which the young insects soon fix themselves; fresh rags are then laid over the "madres" to be again covered with the young. It is found that white rags are best, black and dark colours are *disliked* by the insect. The same difficulty as to the number of insects conveyed to each leaf, exists in this method of planting as well as in the former, with a new element of difficulty, viz., that the production of the young varies with the amount of light admitted into the room. To ensure the greatest quantity of spawn in the shortest time, it is therefore necessary to have a skylight to the room, and it is not improbable that the preference for white rags is owing to their admitting more light to the insect. After pinning the rags to the leaves they are left for a longer or shorter time, according to the state of the weather: in fine and warm weather twenty-four hours suffice, but when the weather is cold and damp they are not removed for three, four, or more days. In the winter season the rags used formerly to be left upon the plants until the time for gathering the crops, in order to protect the young insects from the inclemency of the weather, but experience has shown that this object is better obtained by other means. It may be as well to mention here, that for a winter crop the insects are allowed to spawn far more copiously on each leaf than in summer, as the cold, rain and winds of that season destroy a great many.

When the "madres" have exhausted their powers, which occurs sooner or later, according to the temperature to which they are exposed, and which is known by the young being born black instead of white, they are collected from the bags or trays in which they have been spawning, and put into an oven for drying. The young insect takes more or less time in coming to maturity, according to the weather. Those planted in June are often ready to be gathered in seventy days, or even earlier, whereas those planted in October and November are not ripe till late in February or early in March. Those planted in the latter season, which are intended exclusively to serve as "madres," are allowed to ripen thoroughly before they are gathered, and are not taken off the plant until there are some young to be seen crawling over the leaves. On the other hand, the cochineal planted in March or April for "madres" spawns with such astonishing rapidity in June or July, under the influence of the heat of those months, that, as soon as the first leaf in a plantation which has taken three or four days to cover with insects, is seen to have young upon it, the whole is gathered, for even those that require some hours before arriving at maturity will ripen in warm weather.

The cochineal planted in June and July being the great crop of the year, prepared principally for drying at once into silver cochineal, should be gathered before it commences to spawn. Thus during August and September the grower watches for the first symptoms of spawning, and as soon as they appear, not a moment is lost in proceeding to immediate gathering, for the weather being then quite as warm and bright as in June, the same rapidity in ripening is observable, and the loss of weight is serious if the spawning is allowed to proceed for even a few hours. The proper manner of gathering varies according to the object to which the plants are devoted; but, as a general rule, the leaves on which the bags are placed are sharply cut off with a knife, close to the branches, and the cochineal swept off them into closely woven broad baskets. After the leaves are all cut off and swept they are dropped into the ridges, *where they are left;* another set of gatherers carefully scrape off the insects which have passed into the branches or trunk of the plant; to leave even one or two insects on these branches is fatal to the health of the plant, as they spawn, most probably in hidden spots, and shortly afterwards the strength of the branches, which is required to produce new leaves for the ensuing year, is absorbed by the surreptitious growth of insects, and this is fatal to the future crop. To prevent any young insects remaining on the plants after gathering, the branches are swept several times every two or three days. By this means such as may escape the first or second sweeping, having both grown and changed their position, will be removed on the third or fourth application of the broom. A small insect grows in a few weeks into a "madre," and will propagate several hundreds of young which will eventually much weaken the plant. The leaves cut off at the gathering of the crop, are now chopped up into small pieces and dug into the ground to lighten it, and by their fermentation they warm the roots of the plant, and act as excellent manure; guano is also applied freely. It is found that as much as 15 quintals of guano per 1½ acres can be applied with benefit to the cochineal; a grower at Grand Canary used as much as 25 quintals on one occasion, and was rewarded by a return of from 11 to 12 quintals of cochineal, or nearly double the average crop.

To prevent so much guano injuring the plants, artificial watering is freely resorted to if necessary; a good soaking being given to the ground every three weeks. The cactus cannot bear much water when not strengthened with manure, neither can it bear much manure unless it is copiously watered.

When a plantation is reserved for the production of a winter crop, the leaves are covered with cochineal in the months of October or November; the young cochineal planted at this season ripens, and is ready for gathering at the latter end of February or of March. Another plantation of cacti is reserved for receiving the seed at this season; but as the plants cannot be forced to bud during the winter, the seed must be planted in March upon last year's leaves, which have the disadvantage of being tough for the insect, and this renders a winter crop more precarious than one obtained in summer. However, the sale of "madres" in June brings a quicker return than the dry crop of August or September. The wind and rain during the winter months frequently destroy half the crops, and in summer a hot south wind ("levante") will often kill many of the insects. In order to prevent the losses thus occasioned, light covering of cotton gauze is spread over the whole plantation upon stakes and wires, at a height of about 7 feet. Mats have been used for the purpose, amd also calico, but these materials are found to injure the insects during the winter by keeping off the sunshine, and in summer by preventing the free circulation of air. The baskets are emptied as soon as possible,—the insects that lie at the bottom being injured by the weight,—and the cochineal spread out on trays, or even on a sheet on the ground, not deeper than from two to three inches, otherwise the grain will assume a reddish tinge, which considerably diminishes its value. The cochineal gathered during the day is treated in this way, and towards evening is put into an oven heated to about 150° F.; there it is left for four or five hours, the temperature being carefully kept up; afterwards the oven is allowed to cool gradually until the morning, when the insects are still moist. Exposure to the sun for a few days in summer will complete the drying, and it is found that there is less loss of weight when the cochineal is dried in this manner than would occur if subjected to greater heat, or if left a longer time in the oven in order to dry it at once; even in winter many growers prefer to let their cochineal dry slowly in the air rather than by the heat of the oven, the loss of time being of less importance than the loss of weight. Some growers do not use the oven; a tablespoonful of wood ashes is spread over a pound or two of cochineal, it kills it in a couple of hours; the dust and ashes are then shaken off from the grain in a sieve, and the cochineal is dried in the sun. Others prepare the cochineal by putting it into sacks in moderate quantities; two men grasp the sacks at each end, and shake the grain briskly backwards and forwards; this process gives the cochineal a brilliant polish, and though less weight is finally obtained from a given quantity of green cochineal, the price it commands in the London market compensates for the loss of weight. But the best processes for preparing this polished cochineal are known only to a few, who keep the secret jealously; the oven is, therefore, still almost universally used for drying.

After the grain is thoroughly dried, it is well sifted in order to free it from a white powder which to the last clings to it; numbers of prickles which have fallen from the leaves have also to be removed. Excellent machines have been invented for this purpose both in England and America. The cochineal being thus dried and cleaned, it is packed for exportation into bags containing about 150 lbs. each, which are carefully sewn up. This is done by the trader who buys it of the cultivator, the latter rarely exporting the grain on his own account. The results obtained by different growers of cochineal vary so much, in consequence of the peculiar circumstances to which the crops are exposed in different localities, that it is impossible to fix upon the actual value of an average yield per acre; but it is universally admitted by the land owners in the Canary Islands, that no other branch of agriculture is as remunerative. The average temperature in the southern part of the Canary Islands is about 80° to 85° F., and it rarely falls at night below 56° or 60°. At Laguna and at Orotora, and other places in Teneriffe, where cochineal is cultivated at a height of nearly 2000 feet above the level of the sea, the climate is temperate,—the thermometer rising to 72° or 78° in the summer, and falling at times during winter nights to 45°. In all these places the cactus thrives, and cochineal can consequently be reared successfully.

The average price at which the "madres" can be obtained varies much at different times, falling as low as 9*d.*, and frequently rising to 2*s.* 6*d.* and even 3*s.* per pound.

The management of the insect gives employment to a large number of women; it may almost exclusively be conducted by them. The larger proprietors employ most of their hands during the whole year, so as to command a full number when the labour of the season comes on. The wages of the women in the valley of Orotora is 6*d.* per day, or 3*s.* 6*d.* per week for the best workers. Day labourers receive at the rate of 6*s.* 3*d.* per week for digging and planting, etc. etc. The successful culture of the cochineal requires experience and patient attention on the part of the grower; he will receive his reward by obtaining a return of from 25 to 30 per cent. upon the capital employed.

COMPOSITION OF CUBEBS.

BY E. A. SCHMIDT.

The analysis of fresh cubebs gave the following result:—

	Per cent.	
Water	4·75	
Essential oil	14·22	
Brown colouring matter	6·94	=23·84 soluble in water.
Gum	8·19	
Starch	1·78	
Albumen	2·71	
Extractive matter and salts	4·22	
Oxalate of lime	0·40	
Cubebine	2·48	
Acid resin (cubebic acid)	0·96	
Indifferent resin	2·56	
Green fatty oil	1·18	
Greenish-yellow soft fat	0·51	
Vegetal skeleton	43·07	
Loss	6·03	
	100·00	

The essential oil is colourless or pale green, tasting and smelling intensely of cubebs; it consists of two oils, the one being lighter, of sp. gr. 0·915, boiling-point 220° C., the other being less than one-half, has a sp. gr. of 0·937, and boiling-point 250° C. They both contain 88·26 C and 11·74 H, corresponding to $C_{30}H_{24}$.

It is neutral, soluble in 17 parts of absolute alcohol, it fulminates with iodine, is decomposed by sulphuric acid, and gives with hydrochloric acid vapour a solid and a liquid compound. The oil of fresh cubebs does not contain any stearoptene, like that made from old cubebs.

Cubebine forms fine white needles, by itself it is tasteless, but it imparts a bitter taste to an alcoholic solution; it is insoluble in cold, and slightly soluble in hot water, soluble in 30 parts of ether, and in 75 parts of alcohol; also in chloroform, bisulphide of carbon, acetic acid, and in fatty and essential oils; it melts at 125°–126° C., boils at 190° C., but does not volatilize. It is neutral; concentrated sulphuric acid colours it red, nitric acid brown.—*Archiv der Pharm.* cxli. 1.

The Pharmaceutical Journal.

SATURDAY, SEPTEMBER 30, 1871.

Communications for this Journal, and books for review, etc., should be addressed to the Editor, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to Elias Bremridge, *Secretary,* 17, *Bloomsbury Square, W.C.*

Advertisements to Messrs. Churchill, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE APPLICATION OF THE PHARMACY ACT.

Though we have lately heard much about pharmaceutical monopoly, and the limitation of the right to sell drugs has been spoken of as though it were a ground for reproach, cases are constantly being reported in the daily papers which show that the interests of the public would be more secure if that limitation were more rigidly enforced than it is. Only last week we reported the case of the grocer at Weeley selling laudanum in place of syrup of poppies; and this week we have another case, in which laudanum was given by mistake for tincture of rhubarb.

A provincial paper, in speaking of this case, asks who is the Local Secretary of the Pharmaceutical Society at the place where this occurred; and the writer goes on to say that he should take care not only of the interests of chemists and druggists, but should also see that grocers and others do not sell poisons; and we take the opportunity of mentioning the opinion thus expressed, because we have reason to believe it is one not uncommonly entertained.

A little reflection, however, will suffice to show that such an opinion involves a serious misconception of the duties a Local Secretary of the Society may be expected to perform. It would, in fact, convert those officers into a kind of special police, and, in many instances, might interfere seriously with their own business. In regard to this point it cannot be too strongly urged that under the Pharmacy Act 1868 any one has the power of proceeding against those who deal illegally in poisons, and it would seem that the persons who should do this are those who may be injured. We are constantly receiving letters from members of the trade complaining of the sale of drugs by grocers and other unqualified persons as a practice that is unfair and prejudicial to themselves, and we would recommend to all such a careful study of the Act and its provisions, for we feel sure they would thereby come to see how easily they could protect themselves by its aid.

While speaking of the Pharmacy Act, it may not be amiss to refer again to the very general ignorance prevailing as to the requirements of the Act in the sale of poisons. This is conspicuous with magistrates and coroners. In one of the inquest cases reported this week a druggist was "severely censured" by the coroner for selling laudanum without registering the sale, and told "it was a fortunate thing for him that the evidence went to prove the deceased had not died from taking laudanum, otherwise the verdict would have been a very unpleasant one as far as Mr. Field was concerned," because, as the Coroner affirmed, "it was contrary to law for any chemist to sell poison without registration." It is inexcusable that those whose business it is to administer the law should commit such flagrant errors, and thereby, perhaps, inflict unmerited injury on persons who are in no way open to blame, but who have, as in this case, acted strictly in accordance with the Act.

THE COMING SESSION.

Before the next number of the Journal appears, the holiday season that precedes and follows the meeting of the Pharmaceutical Conference will have come to an end, and the usual routine business of the Society will have been recommenced by the evening meeting, which takes place next Wednesday. On that occasion our readers are aware there will be another of those inaugural addresses which have been for the past three years not only a source of much gratification, but also, we are bold enough to say, a means of exercising a most potent beneficial influence on those who had the good fortune to hear them. This year the series of addresses delivered by Brady, Deane and Schacht will be worthily continued by a pharmaceutist who has always been a staunch supporter of the Society, and has done much to promote the interests of his craft in Scotland. Not only for these reasons, and on account of his mature experience, but also because he is a thorough representative of Scottish character, we urge upon every one who can manage it not to miss the opportunity of hearing John Mackay.

COD-LIVER OIL JELLY.

Preparations of cod-liver oil appear of late to have attracted an unenviable notoriety. If the "palatable" cod-liver oil lately introduced be not more pleasant than the discussion which took place in this Journal in reference to it, we fear that preparation would find little favour. And now a similar difficulty has arisen in reference to the cod-liver oil jelly, which many of our readers will remember was exhibited at the Liverpool Meeting of the Conference. We believe that both, or, at any rate, one of these preparations has enjoyed the advantages of that kind of semi-editorial advertisement by the medical journals which they have lately adopted in common with their comic contemporaries. Some time ago a pharmaceutical correspondent drew our attention to this fact, and raised some doubts as to appropriateness of the recommendations awarded to these specimens of "elegant pharmacy." A medical journal, the *Practitioner*, stated that the amount of cod-liver oil contained in this cod-liver oil jelly was not much more than half what it was represented to be. In a subsequent number of that journal, attention was called to a statement of facts respecting the circumstances connected with a former analysis of cod-liver oil jelly, and also to the results of a further analysis as follows:—

"Our analyst, after making the first examinations, privately communicated their general result to Dr. Attfield, who had certified that a sample of the jelly analysed by him contained 75 per cent. of oil, Mr. Agnew at the same time certifying that all samples supplied to the agents should contain the same proportion of oil. Dr. Attfield, having completely verified our analyst's statement as to the serious deficiency in oil exhibited by various samples actually sold by several respectable London agents of the maker, immediately communicated the fact to Mr. Agnew, and remonstrated with him. The latter gentleman, without waiting for the appearance of our condemnatory report, put forward the following somewhat misleading statement in the weekly medical journals (dated May 19, 1871):—'Dr. Attfield has drawn my attention to a deficiency in the percentage of oil in recent parcels of my "cod-liver oil jelly:" in justice to the Professor, I beg to say that the deficiency has arisen through a miscalculation on my part, and that the error has been corrected.*

"It will be observed (1) that there is no mention of the fact that the error was originally discovered by an outsider (ourselves); (2) that the mistake is spoken of only as occurring in 'recent parcels,' whereas our analyst had detected the same deficiency in parcels of various dates, and also in the small samples of the jelly which were originally sent round to members of the profession; (3) that Mr. Agnew had himself published a formula (sent round with the small specimen samples), according to which the proportion of oil that should have been present was 83 volumes per cent., thus making the deficiency detected by us still more serious. We are thus reduced to the following awkward dilemma: either Mr. Agnew supplied a sample of the jelly to Dr. Attfield, for analysis, which did not at all represent the jelly actually in the market, or the latter gentleman made a mistake in his original analysis of from 15 to 20 per cent. Be that as it may, it is quite evident from the above detailed facts that such general certificates as those which were published by the maker of the jelly are absolutely valueless as a protection to the public, and that analytical chemists would do well altogether to refuse to give such testimonials.

"In consequence of the above declaration of the maker, we have thought it our duty to analyse samples of cod-liver oil furnished to the London agents, from the factory, several weeks after the date of that document. We regret to say that we still find a deficiency of 15 to 16 per cent., as the analytical details given below will sufficiently show. We leave the profession, the manufacturers of drugs, and the analytical chemists of this country to their own reflections and conclusions on the matter. We make no comment whatever on the motives of any persons concerned; but we must distinctly point out that but for the interference of the *Practitioner* a very serious and misleading manufacturing error might have been continued for an indefinite period."

* We think it only just to ourselves to state that the paragraph referred to was sent to us, and that we declined to publish it otherwise than as an advertisement.—Ed. Pharm. Journ.

To these remarks were appended the following report of the results of analyses of two samples of the preparation purchased of wholesale dealers in London:—

Number.	Cod-liver Oil. Per cent. by volume in volume.	Cod-liver Oil. Per cent. by weight in weight.	Sugar. Per cent. by weight.	Specific gravity.
I.	58·73	50·29	31·22	1081·4
II.	61·84	52·93	29·69	1080·8

"The jelly, if made according to declaration, should just about float in water; whereas the above readily sinks down in it, and floats only in a syrup containing ℥j of sugar to ℥iv of water."

The August number of the *Practitioner* contains a letter in which Mr. Agnew endeavours to defend himself by suggesting that the foregoing results were arrived at, not by analysis, but by calculation from the specific gravity. This is repudiated by the Editor of the *Practitioner*.

MORE ABOUT CONDURANGO.

There appears now to be but small probability that the great expectations once entertained that condurango would prove to be a remedy for cancer will be realized. The *British Medical Journal*, in a recent number, remarks:—

"All that we hear of the results of the trials given to the condurango bark furnished by our Government to the Middlesex and St. Bartholomew's hospitals, through the College of Physicians, confirms the fear that any hope which might have been entertained, of a confirmation of the statement of its utility as a remedy in cancer, must be entirely dismissed. Physiologically, it appears to be practically inert, and its therapeutic effects in the treatment of cancer to be *nil*. It furnishes a slightly bitter extract of feeble characters. A detailed therapeutical report will be made by Mr. Hulke, and a careful examination of its physiological action by Dr. Brunton, but this mainly in deference rather to the official sources from which the small supply has been furnished, and to set at rest the excitement caused by the somewhat scandalous claims which have been set up in its favour."

To judge by the following extract, the editor of the Chicago *Pharmacist*, too, has arrived at a somewhat similar conclusion, though the style of composition in which his opinion is announced slightly varies from that of the English journal, and the language is rather more racy of the soil than we are accustomed to meet with in our American contemporary:—

"It can hardly fail to cause the heart of the American pharmacist to bound for joy to know that Dr. Bliss, from blissful Washington, has announced the blissful intelligence that a cargo of cundurango has arrived in New York, which will be furnished to the profession at the highest possible prices. 'See, the conquering hero comes!' The very name cundurango has a high and mighty conquering sound—sweetly blended of high Spanish, Guinea Nigger, Fiji, and Whang Doodle. Dr. Bliss has taken steps to Helmboldize the drug at once. We will soon see it marching on across the Continent, side by side with the other heroic names which, by the magic of paint and cheap blacking, blazoned on every bridge, fence, and crag, from the Atlantic to the Pacific, have been stencilled upon the great American heart."

Proceedings of Scientific Societies.

SOCIETY OF ARTS.

Boiled Oils and Varnishes.

BY CHARLES W. VINCENT, ESQ.

(*Concluded from page 255.*)

The jacket and pan should be capable of standing a working pressure of 40 lb. per inch. The top of the pan is closed by a dome riveted to it, and forming part of it. This dome is provided with a man-hole, and in the centre is furnished with a stuffing-box, through which pass two shafts, one encircling the other, and each bearing a fan, which fans, by gearing outside the pan, are made to rotate in opposite directions, intersecting each other in so doing, and, as may be conceived, producing a most thorough admixture of any solid and fluid substances submitted to their dashing and cutting action. At one side of the top of the dome is a kind of cupola, from the top of which issues a three-inch pipe, which is carried down to the ash-pit below the boiler furnace. When at work, care is taken that every joint is tight, hence any vapours arising in the interior of the pan have no chance of escaping into the air till they have passed the burning coals. One of the greatest dangers and also disagreeable nuisances being thus obviated, oil-boiling can be, and is carried on without objection on the part of either the insurance companies or the public at large, even in the heart of densely-populated districts. I myself boiled oil and made varnish in Milford Lane, Strand, for three years, without increasing the insurance of the *Illustrated London News*, though I used steam from their boilers for the purpose.

At the lower part of the pan, the inch-pipe from a powerful air force-pump penetrates through the jacket to the interior of the pan.

The workman's first care is to see that all his taps and valves are in good, efficient order, and turned the right way, after which the mode of manipulation is the following:—

The linseed-oil is first shot into a large tank, holding one batch for boiling (about two tons is the usual quantity), and allowed to settle for four or five hours, according to the time taken for boiling the previous batch, matters being so arranged that as soon as one batch is pumped up into the pan another is shot into the tank, so that the oil may have as long a time for freeing itself from mechanical impurities as can be spared for that purpose. The waste steam from the pan passes through a coil of inch and a half iron pipe placed in this tank, so that the oil is also being warmed, this much facilitating the separation of particles of dust, mucilage, etc., and also saving time when the actual boiling commences. The time having arrived when the pan is ready, the oil has acquired a temperature of about 95° F. before it is pumped up (in the works I am describing the arrangement of pumps used took about seven minutes to elevate two tons of oil twenty feet), full pressure of steam is then turned on the pan, and the fan started. At first there is little or no disagreeable smell to be perceived. If the man-hole of the pan be open, an observer can watch the oil churning round with very little frothing, although the blades of the two fans, rotating in opposite directions, cause such a perfect commingling of the oil and the air that is in the upper part of the pan, that, looking in upon the whole fluid mass, it seems as if the bulk were greatly increased, as it goes on swelling and chafing, with a hollow rumbling noise, at the rough treatment it is receiving. A few minutes later, a faint, sickly odour is to be perceived, something like the smell of the raw oil, but intensified as to its woody constituents. The oil is now nearly hot enough for the air to be turned on. This may be done as soon as the steam reaches a pressure of 35 lbs. to the square inch on the pan. Directly this is done, the character and the appearance of the oil changes; the bulk appears to be still more increased, a foaming, seething, whirling vortex presents itself, the colour suddenly changes from the dark brown it previously exhibited to a mass of pale yellow bubbles, and the strong pungent odour universally accompanying the boiling of oil makes itself known and felt by the discharge from eyes and nose, if the curious observer does not take the hint that it is time the man-hole was closed, and the cauldron left to complete its witchery in darkness and solitude, if not in silence. But before it is left to itself, it may be well to observe that, before the air was turned on, a taper would burn in any part of the space above the oil where it was safe from being extinguished by splashes. After the air has been blown through the oil for a short time, if both the flue and air-pumps be stopped, so that a perfectly quiescent atmosphere remains above the oil, it is found to be perfectly incapable of supporting combustion. A few inches inside the man-hole, I have found that a brown paper torch, dipped in turpentine, has been immediately extinguished.

If a dark boiled-oil is desired, the driers should be put in as soon as the oil is thoroughly heated throughout its bulk, which is commonly about half an hour after the steam has an indicated pressure of 35 lbs. They are ground to a fine powder, mixed with oil, and are introduced through a funnel, with a stop-cock intervening between it and the pan, in a thin stream, so as to secure as perfect a distribution of them as possible throughout the oil. The quantity of driers used amounts only to about three quarters of a pound to each hundred-weight of oil, so that the necessity is obvious of great pains being taken to secure and maintain as complete a diffusion through the liquid as can be attained, and thus coincide with the theory of this method of oil-boiling, which requires that each particle of oil should be in contact or proximity to a particle of the drier used and oxygen at one and the same time.

Subsequent to the introduction of the driers, no attention is required to the process save to see that the air-pump and fan are kept constantly at work, and that the pressure of steam on the pan does not sink at all below 30 lbs., 35 lbs. being that which ought to be adhered to. The right quantity of air to be introduced for the oxidation of a given quantity of oil has not been ascertained. In practice, it is found that some oils require, and will consume a larger amount than others; the custom is to throw in as much as the oil will take without frothing up and priming into the condenser. The cooling effect of the air thus introduced is much less than might be supposed, in point of fact, the pressure to which it is subjected in overcoming the weight of the oil, lifting the heavy valves, and the friction tubes it passes through, considerably raises its temperature before it enters the pan; it is generally found to be raised some 20 to 30 degrees above the temperature it previously had by the time it reaches the oil. Indeed, the tubes through which it passes not unfrequently become hotter than the bare hand would be able to hold in a firm grip. In four hours' time the oil is generally fit for removing from the pan to a tank, where it can remain a sufficient time for the major part of the driers to settle out from it. When bright, it is then either pumped or run off into other tanks for warehousing, or may be allowed to remain where it is for the future use, if there are plenty of working tanks.

The mode of emptying the pan is by allowing the oil to rush out through a two-inch tap in the centre of the bottom of the pan into pipes which are connected by running-joints, and lead it in any desired direction. Sometimes, a little difficulty occurs in dropping the oil, through the orifice of the tap leading into the pan becoming stopped up by an accumulation of driers, or by pieces of the old skins of oil which may have fallen from the sides of the pan. This may be entirely obviated by causing the air to enter the pan through this tap, and putting the second tap beyond the air inlet as an outlet for the oil. The pressure of the air-pump will then suffice to remove any ordinary obstruction; but if a stoppage, nevertheless, should occur, nothing remains but to probe the tap with a long, thin rod from the top of the pan. Until this simple expedient of letting in the air through the oil outlet was adopted, this terrible nuisance was of almost daily occurrence.

The vapour which comes off from hot oil into which air has been blown is so intensely acrid and pungent that human nature seems to be incapable of ever getting used to it. For my own part, I would much prefer entering a freshly-opened bleaching-powder chamber to an oil-pan, even after the oil has been run off, and the pan cooled down. There was no task in the works more thoroughly abhorred than that ten minutes to half an hour, occasionally longer, during which, with the man-hole open, the workman was raking and poking between the radii of the fans to clear and find the outlet. With this now happily occasional exception, and for the few minutes during which the hot oil is being transferred from the pan to the tanks, this method of oil-boiling produces no disagreeable smell in the vicinity, the fumes being carried away with the surplus air pumped through the oil, and perfectly consumed, so far as noxious odour is concerned, in the furnace of the boiler. Members of this Society have frequently the opportunity of witnessing the efficacy of the operation of this process during some of the lectures delivered here, the air of this hall being kept free from troublesome fumes by a similar arrangement. From this paper the chemical questions involved must be, for the most part, excluded, as it would be scarcely possible for me to enter far into the subject without betraying confidence, the driers used, and their *modus operandi* being essentially connected. I may state, however, that the air does not play the part which many have assigned to it, and does in reality effect nothing towards making the oil a drying one. I have boiled linseed-oil with air alone, but without driers, for three days consecutively, keeping up a high temperature the whole time, and the resultant boiled-oil has taken precisely the same time to dry as the raw oil from which it was prepared. The body, however, had so much increased that the consistency was more that of a varnish than an oil.

If oil be subjected to heat alone for the same space of time, without any air except such as comes in contact with its surface, there is no such increase in consistence as in the former case; the oil simply becomes more greasy, has less difficulty in penetrating capillary tubes (as, for instance, those of paper, plaster, etc.) than it previously had, and has decidedly less drying powers. The oil which has been boiled with air is less greasy, and has a greater consistence. To sum up the process in a few words, I think we show we have the means at hand of meeting all the requisites which were stated to be necessary. The close apparatus in which the work is performed secures the manufacturer alike from annoying his neighbours and injuring his own men. The air and heat secure a sufficient amount of body. The driers produce any required shade of colour, the time of drying, *i. e.* about six hours in summer and eight hours in winter, according with the old standard of drying power. Oil can be made to dry in much less time, but this is not considered to be desirable. The mechanical appliances reduce the time of the operation to about one-fourth of that which in former years was thought essential. In the ordinary working day, starting with cold oil and a cold boiler, two batches, of two tons each, can be boiled without causing undue driving of men or machinery.

Before leaving this part of the subject it may be as well to note, that for boiled-oil which has to be exported, long experience has shown that it is advisable in all cases to add to each barrel or drum of boiled-oil a small proportion of raw oil. After a one or two months' voyage the oil becomes brighter than it was when first shipped, and the risk of becoming what is called "fatty," and not free enough in working, is thereby avoided. For a three months' voyage, one gallon of raw linseed may be added to each four gallons of boiled-oil with most beneficial results, particularly if the boiled-oil be anything under one month old.

Varnishes.

As you all know, the main uses to which varnishes are applied are, to protect the material over which it is spread from atmospheric influences, accidental rough usage, etc.; to bring out and display more fully the varying texture of different woods; and, finally, to give a fine gloss or appearance of polish to the surfaces to which it is applied. As commonly constituted, an oil varnish (and with these alone I propose to deal) consists of some hard gum dissolved in linseed oil. This is the substance of the varnish, the two being re-dissolved in turpentine to afford the means of spreading them out in thin layers. As far as regards the ultimate value of the varnish, the turpentine is merely so much waste material. It may, if it be of inferior quality, injure the varnish with which it is mixed, but, however good it may be, it can do nothing to benefit or improve a varnish which itself is in reality nothing but the mixture in various proportions of some one or more hard gums in linseed oil.

For the convenience of better understanding the *rationale* of the mode of procedure, it will be well if we commence our observations at the end instead of beginning of the process.

Turpentine, being applied for the purpose of thinning down the body of the varnish, and that body being, when cold, almost solid, has to be added whilst the mixture of gum and oil is still hot. The heat causing an increased evaporation, and consequently a loss of turpentine, the temperature is allowed to get as low as can be, consistently with a perfect and complete admixture of the spirit with the matter being secured. This is, to some extent, contrary to old-fashioned notions, but the varnishes resulting from mixing in the turpentine at a high temperature and at a low one being identical, the loss of so much evaporated material is not now taken as an essential part of the process. We have also one less risk of fire, since the whole varnish is now removed far from any fire, and out into the open air when practicable, before the turpentine is added. The quantity of turpentine required under these circumstances is much less than that stated in the various published recipes for varnish making. Enough is commonly added to bring the whole mixture to a consistence a little stiffer than linseed-oil. The loss by evaporation, whilst clearing and ageing in tanks, previous to its being sent out, gives it the amount of body which you are accustomed to see it have. The next thing to consider is the body of the varnish. Time would not permit me to give a complete description of the various gums which are or may be used; I can do no better than refer you to Mr. Neil's paper for information on this part of the subject. There is one gum, however, which has come very largely into use since his time, and that is the "kauri," New Zealand gum. It is rather dull in appearance, but it is tolerably hard, and melts at so low a temperature that the dust and chips made by cleaning the outside of large pieces can be utilized by a skilful man, without the gum being coloured by the carbonization of the woody matter in it. The varnish made from the better qualities of kauri have a very good gloss. When dry, they are pale in colour; dry quickly, and are not so liable to crack when exposed to the sun as better varnishes. After a few months' exposure to wet, however, the whole of the gloss disappears, and, though the protecting surface remains, it becomes, through its abrasion, a harbour for the dust and dirt, and is thus rendered far from ornamental to the place of its attachment.

The temperature at which the mixture of gum and oil intended to be used melts is now recognized as forming a basis for the temperature to which the oil is to be heated previous to the introduction of the melted gum, the whole running, when the two are fairly incorporated, being also kept much under the degree of heat which was formerly considered necessary. In fact, it is in this respect that the present mode of varnish-making chiefly differs from the modes formerly employed, the greatest care being now taken to keep the temperature throughout the process as low as is consistent with perfect admixture of the several ingredients.

The next point to which I shall direct your attention is the apparatus used for the modern process of varnish-making. In the first place, iron vessels generally take the place of copper ones for all common varnishes, the bottom of the gum pots alone remaining copper, as heretofore. The lower temperature employed is found not to affect the metal, and the introduction of impurities from that source is no longer feared.

In the next place, instead of heavy copper stirrers, light thin plates at the end of the rods are used to cut the gum, etc., the greater velocity with which they can be manipulated securing more perfect mixing than of old.

In the third place, a tramway is laid down from the furnace in which the mixed gum and oil is heated, which usually runs from the shed into the open air. If, therefore, from any accident the mixture takes fire, it can be at once removed to a place of safety, where it can be put out at more leisure.

The boiling-pot, which holds about 100 gallons, has a closely-fitting conical cover, which, if it can be put on, at once extinguishes the flame if it be not too far ahead. The last improvement has only recently been introduced, and is not yet generally adopted. Two galvanized iron shafts are erected side by side; one corresponds with the gum pot, the other with the boiling-pot; the upper end of these shafts alike communicates with the main furnace shaft. The lower ends are fitted with caps, which are so balanced by counterpoises that they can be slid up or down their respective columns. To these caps heads are attached at right angles, which can be brought over, and which fit closely on to the gum pot and boiling-pot respectively, and, when in that position, have free communication with the chimney-shaft. The front of each hood is cut away and fitted with a diaphragm, slit in such a manner that the contents of the pots can be stirred, and is removable when it is desired to see into them.

The advantages of this arrangement are obvious without further description; in place of the workmen being annoyed by the dense and pungent vapours which escape from the heated gum and oil, the whole are removed, and nothing whatever comes into the air of the shed except at the time when a pot of the gum is being tilted into the boiling-pot, or when the whole has to be removed into the air. The reduction of smell, as regards the neighbourhood, is so great, that in the comparatively rare intervals when a disagreeable vapour does come off, the air of the yard mixes with it sufficiently to neutralize the effect exterior to the works. This last improvement is due to Mr. Bewicke, of Hackney Wick, who, in consequence of a disastrous fire at his works having been caused in a great measure by the men being so suffocated with the fumes from the boiling-pot that they were unable, when it took fire, to extinguish it in time, has been impelled to seek for such more perfect appliances as would bring the whole system more under control than had previously been the case. I think you will agree that the plan deserves to succeed, and from the experience it has already had, I believe it will do so. Old varnish makers, standing at the furnaces when they are in full operation, seem at first almost at a loss to know what stage of the process they are at, from the want of their accustomed choking miasma.

Discussion.

The Chairman, in inviting discussion on the subject, said, if any members of the trade were present, who could furnish the meeting with any of the information which it would seem was rather kept secret, it would, no doubt, be of great advantage.

Mr. Tinne said he had hoped some practical man would have made some remarks on the subject, which he thought would be of great value. It was one very interesting to him, as he had seen abroad, especially in Holland, the beautiful character of what was there called porcelain painting, and he believed its great merit arose from some particular purity in the preparation of their boiled-oil and varnishes. He had been specially anxious, in the painting of his own house, to apply that same beautiful white porcelain painting which he had seen in Holland, but as yet he had not seen anything of the kind in this country. Allusion had been made to this improved process having originated in Germany, and no doubt Mr. Vincent was aware that the same thing existed in Germany as he had alluded to in Holland, and which might be noticed even on the Dutch ships which came to this country. He should much like to see the same kind of thing introduced here, for, unfortunately, what was called porcelain painting generally turned very yellow in a short time. He could only ascribe this to either ignorance on the part of the workmen, or impurity of the materials employed; and he hoped, therefore, that some improvement would soon be made.

Mr. Nicholson said, with reference to what had just been remarked about oil not being produced in this country capable of keeping the colour of the paints used in its original brightness, it was well known in the trade that there was an oil almost colourless, which was used largely by decorators for the finer class of work. It was an oil which had not been heated in any way, but simply oxygenated, and it had a powerful drying tendency, almost equal to that of boiled-oil; and if Mr. Tinne would confer with any decorator of note, he would tell him that that oil was in constant use. He had been much struck with the low temperature referred to by the lecturer in the boiling of oil, which he thought was about 260 degrees, and that the oil then showed no fatty tendency. It was, however, well known in the trade that oil might be boiled up to 600 degrees without showing any such tendency; in fact, that was the ordinary heat to which it was subjected in the process of trial before used for varnish-making. An oil would hardly show its impurities at a less temperature, certainly not under 500 degrees; at all events that was the opinion of the trade. With regard to varnish-making, the method described seemed to him somewhat of a primitive nature, for there was a process in common use whereby the whole of the vapour arising from the oil-pot and from the gum-pot was wholly absorbed and condensed into liquid, not passing into the chimney at all.

Mr. Vincent said he had great pleasure in agreeing with what had been said by Mr. Tinne with regard to the character of Dutch and German paintings; and it was really the fact that the oils which were boiled abroad had that characteristic which had been spoken of. They were, as a rule, paler than oils boiled in England, and, having no driers dissolved in them, they did not deteriorate the colours with which they were mixed, and thus the maximum of brightness was attained. He supposed the last speaker had referred to what was generally called "French oil varnish," which was a thing which had been known in the trade for the last thirty or forty years for the purpose of mixing with pale colours, and for producing very lightly coloured delicate paints. What he aimed at was this. There were a large number of persons in the trade who were not aware of the great advantages of using these pale oils, or otherwise there would not be so much oil boiled of such a dark colour. There was a sample on the table darker even than that which he had shown on the screen, and that was boiled especially to the order of a large consumer, who would have oil of that colour and character, and who used about a ton and a half per week at this time of the year. If there was not a demand for these dark-coloured oils they would not be produced. Mr. Nicholson's other remarks were in accordance with what he had already stated, that there were a great many processes in use which were not commonly known. He himself could only describe what passed under his own observation, the varnish and oil trade being, as he had remarked, a secret one. Mr. Nicholson had not stated the particulars of the process he had mentioned for removing the vapours arising from the gum and oil-boiling apparatus, and even the one he had himself described had only become known to him within the last few weeks, and he had had a good deal of experience. It was simply because of these processes being kept secret that people who would be very ready to adopt improvements, and so avoid being troublesome to their neighbours, and at the same time be able to produce a better article, were not able to do so; and every one had to discover for himself what other persons perhaps had long been practising. The Society of Arts had been instrumental in throwing light upon some of these dark doings many years ago; and if his paper, imperfect as it was, had the effect of drawing attention to the subject, and inducing those who had more knowledge and experience in the matter to come forward and make known the results of their experiments, all the purposes he had in view would be answered.

Mr. Nicholson said he should have much pleasure in showing Mr. Vincent over his manufactory if he had any disposition to see it.

The Chairman then proposed a vote of thanks to Mr. Vincent, which was carried unanimously, and the meeting separated.

Parliamentary and Law Proceedings.

The Serious Charge against a Chemist at Rotherham.

On Monday last, Mr. William Collinson, chemist and druggist, Masboro' Bridge, was brought up on remand at the Rotherham Police Court, charged with having caused the death of Eliza Utley. The evidence given on this occasion was principally a recapitulation of that given before the coroner, and printed last week in this Journal.

Mr. Whitfield, who represented the prisoner, argued that although under all the circumstances of this case, supposing that all that had been stated by the witnesses and the dying girl herself was believed implicitly, technically and legally it might amount to the crime of murder, he would venture to say that there was not a jury to be found in this country which would, under the circumstances of the case, find the accused guilty of murder. The coroner paid very great attention to the evidence adduced in the case, and there was no more evidence adduced before the bench than there was adduced before the coroner, and he (the coroner) found it his duty to tell the jury that, according to his judgment and experience, it would be competent for them to find a verdict of murder, but he would not recommend them to do so. Mr. Whitfield contended that the medical evidence made out nothing whatever against the prisoner, and that it was against the rules of evidence that a declaration made by a person in the absence of the accused should be admitted as evidence. He said that the statement was made at the eleventh hour under the extreme pressure of circumstances, the deceased having to account to her parents for the state she was in, and was not to be depended on. Deceased stated that she had been to Mr. Collinson, and Mr. Collinson said that was perfectly true, not for the purpose she had alleged, but for the ordinary one of relieving her from a pressure of water. The charge of murder was totally out of the question both as a matter of fact and as a matter of practice. The coroner knew that, and said that the charge against him was that of manslaughter, and he (Mr. Whitfield) thought that the Bench would come to the same decision.

The charge and the usual caution were then formally read over to the prisoner, who in answer said, "I only wish to say that I am entirely innocent of the charge."

The Chairman said, after a few minutes' consultation, that the Bench considered they had nothing to do with what the jury at the assizes would do. It was their duty to commit him on a charge of murder to the assizes.

There was much sensation in court at the close of the Chairman's remarks.

Mr. Whitfield then applied for bail.

The Chairman said the Bench had already consulted on that point, and had come to the conclusion that on such a serious charge bail could not be granted.

Censure of a Chemist by a Coroner.

An inquest was held on Thursday, September 21, at the Wheatsheaf Inn, West Orchard, Coventry, before T. Dewes, Esq., coroner, on the body of a woman, apparently about sixty-four years of age, whose name was not known. From the evidence it appeared that the deceased had been staying at a lodging-house kept by James Doogan. She had not complained of ill-health, but looked rather delicate, and had a cancer in her cheek. On Wednesday night she went to bed as usual, and on Thursday morning was found dead in bed with her clothes on. A half-ounce bottle of laudanum was found in the pocket of the dress worn by the deceased. The bottle was quite full, and bore the label* of Mr. Field, chemist and druggist, Coventry.

Mr. Edgar Overton and Mr. Shorter, surgeons, having made a *post-mortem* examination, gave evidence to the effect that the deceased died from serous apoplexy, produced by disease of the liver and left lung and the cancer, and the jury returned a verdict accordingly.

The coroner sent for Mr. Field, who appeared and admitted that the laudanum had been supplied from one of his shops. In answer to the coroner, Mr. Field said he did not think the bottle held more than enough laudanum to poison two persons. He also admitted that he had not registered the sale of the laudanum.

The coroner severely censured Mr. Field, and told him that it was a fortunate thing for him that the evidence went to prove that the deceased had not died from taking laudanum, otherwise the verdict would have been a very unpleasant one as far as Mr. Field was concerned. The coroner said that it was contrary to law for any chemist to sell poison without registering it.—*Coventry Newspaper.*

Female Apothecaries.

We have been favoured with the following paragraph from a local newspaper: "On Tuesday, an elderly woman, named Barker, residing at Norfolk Villa, Milton, went to the shop of a Mrs. Lashmar, and asked for threepence' worth of tincture of rhubarb, which she partook of

* We learn upon inquiry that the bottle was also labelled with the word poison, according to the requirements of the Pharmacy Act, and that the woman was cautioned in reference to taking it.

in the shop, and was supplied with a second dose which she said was for her son. Upon arriving home the same was administered to her son. Shortly after partaking of the supposed rhubarb, they both became very drowsy, and the symptoms becoming suspicious the neighbours at once communicated with police constable Pemberton, and Mr. Firman, surgeon, of Harmer Street, was quickly in attendance. It appears that instead of the unfortunate recipients of the apothecary's skill partaking of syrup of rhubarb, they had had administered unto them each three-quarters of an ounce of virulent poison—laudanum. Wet towels were applied to their heads, and after vomiting a great deal they were restored to consciousness, and are now progressing favourably."

Reviews.

Domestic Botany: an Exposition of the Structure and Classification of Plants; and of their Uses for Food, Clothing, Medicine, and Manufacturing Purposes. By John Smith, A.L.S., Ex-curator of the Royal Botanic Gardens, Kew. London: L. Reeve and Co. 1871.

We regret to have to speak depreciatingly of a work by one who has done so much useful work as the author of this book. We must, however, enter our protest against the publication of a scientific work so full of inaccuracies and absolute errors as is the first part of this volume. It is stated in the preface that the proof-sheets have been revised by two very competent gentlemen. This statement, however, can hardly apply to the part of the work of which we are now speaking. We object to the coining of such words as "rhizomat," "frutlet," and "thyclad," which answer no useful purpose, and can only bewilder the reader. We object still more to the use of such forms as "phyllodæ" and "involucræ" instead of "phyllodia" and "involucra" (in the plural). But yet more objectionable is the introduction to the botanical student of inadequate or absolutely incorrect definitions. We find, for instance, a "cyme" described without any allusion to the special centrifugal character of that mode of inflorescence, which may be found in any ordinary text-book. The greatest offence, however, is the definition of the pistil of a plant as comprising the style and stigma only, to the exclusion of the ovary, which any first year's medical student might have corrected. And yet this occurs three times!—at p. 39, "on the removal of the calyx, corolla, and stamens, the pistil will be seen seated on a round knob, or more or less elevated column called the ovary or germen;" at p. 47, "the pistil or pistils, there being often more than one in a flower, is seated on the ovary;" and at p. 57, "an ovary, with its pistil, is termed a carpel!"

When we pass from the first to the second part of the work, "The Families of Plants systematically arranged, with a description of their characters, properties, uses, etc.," we find the author much more in his element. There is collected here a very large amount of information, arranged in a convenient form, with respect to the various plants comprised in each Natural Order of flowering and flowerless plants that are useful for food or clothing, or for any of the various purposes incident to civilization. Thus, under the Order Leguminosæ, upwards of eighty species are enumerated, each of which is of some economical importance, and their properties and uses described. This portion of the work is so complete, and so valuable as a book of reference as to the various useful products derived from the vegetable kingdom, that it is the more to be regretted that the early part is so inaccurate, and so hastily put together. The volume is illustrated by a number of coloured drawings, which add greatly to its attractiveness.

Handbook of British Fungi, with full Descriptions of all the Species, and Illustrations of the Genera. By M. C. Cooke, M.A. 2 vols. London: Macmillan and Co. 1871.

With the spread of the study of natural science, not only does it become inevitable that the whole range of the vegetable kingdom is beyond the powers of any single man, however industrious, but specialists are obliged to devote themselves to particular departments, even of phænogamic or of cryptogamic botany. The number of described species of British fungi alone is considerably larger than that of our flowering plants; and since the most recent handbook in existence, the Rev. M. J. Berkeley's, is now thirty-five years old, the great advances made since that time in the knowledge of this class of plants has rendered a new one absolutely necessary to the mycologist. We are, therefore, very grateful to Mr. Cooke that he has added to his labours in cryptogamic and microscopic botany, so well known to readers of this Journal, the publication of the volumes before us. Although the author has been assisted by all the other leading English mycologists,—Mr. Berkeley, Mr. Currey, Mr. Broome, Mr. Worthington Smith, and others,—the labour of writing fresh, accurate, and yet terse descriptions of 364 genera and upwards of 2800 species, must have been very great. With regard to the manner in which the work has been performed, we have nothing but commendation to award. The descriptions are clear, neither too short nor too long, and contain just the information one wants about each species. Mr. Cooke has not attempted any originality in classification, following that of such standard authorities as Fries and the Rev. M. J. Berkeley. In his subdivision of the huge and difficult genus *Agaricus* he has adopted the arrangement of Mr. Worthington Smith, who has paid so much attention to the higher fungi, and whose analytical key of the subgenera is also reprinted. If we were to make the least criticism, it would be that some phrases are occasionally used with a certain vagueness; thus we are sometimes left in doubt whether by "agaric" is meant a member of the Order *Agaricini* or of the genus *Agaricus*. There is a coloured frontispiece, and a small woodcut to illustrate each genus, admirably drawn by Mr. W. G. Smith. The very low price at which the book is published is another item which makes it indispensable to the library of all botanists, and especially of all lovers of fungi.

VACANCIES AND APPOINTMENTS IN CONNECTION WITH PHARMACY.

The Editor will be glad to receive early notice of any vacancies of pharmaceutical offices connected with public institutions, and likewise of appointments that are made,—in order that they may be published regularly in the Journal.

APPOINTMENT.

Mr. John S. Cape, Associate of the Pharmaceutical Society, has been appointed by the Admiralty in charge of Medical Stores at the Royal Naval Hospital, Hong Kong.

The following journals have been received:—The 'British Medical Journal,' Sept. 23; the 'Medical Times and Gazette,' Sept. 23; the 'Lancet,' Sept. 23; the 'Medical Press and Circular,' Sept. 27; 'Nature,' Sept. 21; the 'Chemical News,' Sept. 23; 'English Mechanic,' Sept. 22; 'Gardeners' Chronicle,' Sept. 23; the 'Grocer,' Sept. 23; the 'Journal of the Society of Arts,' Sept. 23; the 'Chicago Pharmacist' for September; the 'Yorkshire Post and Leeds Intelligence,' Sept. 20; 'Rotherham and Masbro' Advertiser,' Sept. 25.

Notes and Queries.

**** In order to facilitate reference, correspondents are requested to mark their answers in each case with the title and number of the query referred to.*

No notice can be taken of anonymous communications. All queries or answers should be accompanied by the name and address of the writer.

[280.]—DISPENSING.—For potass. hydr., I should think, without a doubt, potassii iodidi is intended, the dose being only 1·25 grains in excess of the maximum dose of the P. B., the caustic potash being never given internally, except in the form of liquor potassii.—S. NEWBURY, *Medical Hall, Dorking.*

OINTMENT CONTAINING MUCH WATER.—The following recipe was recently handed to me to be filled:—

℞ Pyroligneous Acid,
Sulphur, each 4 oz.
Calomel, 60 grs.
Red Precipitate, 40 grs.
Spt. Turpentine, 1½ oz.
Lard, 4 oz. M.

I first intimately mixed the calomel and precipitate, then by degrees the sulphur, the turpentine, and finally a small portion of the lard. I now added a little, say two fluid-drachms of the acid, but entirely failed to get a mixture. As the acid is largely composed of water, the object was to dispose of the latter so that it might not interfere with the mixture. This was done by adding to the salve in the mortar a little wheat flour, with perfect success, after which lard, flour and acid were added alternately until the ointment was finished, leaving out of it as much lard as flour had been substituted. Four hours afterward, the ointment not having been called for yet, and the weather being very warm, it was found that some of the lard had melted, and was floating on the top, but readily mixed with the ointment again on making use of a spatula, but no part of the acid at any time separated from it.—JOHN H. EHLERS *in the American Journal of Pharmacy.*

THE CHEMISTRY OF TAKING OUT IRON-MOULDS.—Although the routine method of doing this is familiar to every chemist, the chemical reactions involved are by no means generally understood, and therefore a brief account of them may not be unacceptable.

My attention was first called to the subject while testing the comparative efficiency of three familiar solvents of ferric oxide, viz. hydrochloric acid, oxalic acid and quadroxalate of potassium—the sal acetos.

I was surprised to find that the latter, which I had regarded as most eligible merely for its convenience in application, was superior also in solvent power. When hydrated peroxide of iron is treated with a strong hot solution of sal acetos, in the proportion of two equivalents of the latter to one of the former, carbon dioxide is copiously evolved, the oxide is dissolved, and at the same time chiefly, if not wholly, reduced to the ferrous state.

The resulting solution is yellowish-green in colour, yields a well-marked precipitate with potassium ferridcyanide, and appears to contain ferrous oxalate and neutral potassium oxalate. The following is the equation:—

$$Fe_2O_3H_2O + 2KHC_2O_4H_2C_2O_42H_2O$$
$$= 2FeC_2O_4 + K_2C_2O_4 + 2CO_2 + 8H_2O.$$

The same result followed when the oxide was acted upon by a strong solution of oxalic acid at a boiling heat, but less quickly, moreover the resulting solution was of a deep yellowish-brown colour, and contained more ferric salt.

Three equivalents of oxalic acid to one of oxide were employed, as in the following equation:—

$$Fe_2O_3H_2O + 3H_2C_2O_42H_2O$$
$$= 2FeC_2O_4 + 2CO_2 + 10H_2O.$$

Knowing that a mixture of sal acetos and cream of tartar is sometimes sold as salt of lemons, I next tested the solvent power of this combination.

Taking as my guide the proportions employed in making the ferrum tartaratum of the Pharmacopœia, I compared the action on ferric oxide, of boiling solutions of acid tartrate of potassium, sal acetos and of a mixture of the two.

Only a small portion of the oxide was taken up by the acid tartrate either alone or combined, and the equivalent quantity of ferric oxide was dissolved more rapidly by the sal acetos alone.

Experiments performed upon black oxide of manganese showed that it, like ferric hydrate, was dissolved by hot solutions of oxalic acid and sal acetos, but reprecipitated as flesh-coloured or buff manganous oxalate, carbon dioxide being given off; the following equations show the reactions:—

$$MnO_2 + 2KHC_2O_4,H_2C_2O_42H_2O$$
$$= MnC_2O_4 + 2KHC_2O_4 + 2CO_2 + 6H_2O.$$

$$MnO_2 + 2H_2C_2O_42H_2O = MnC_2O_4 + 2CO_2 + 6H_2O.$$

Similar experiments with mercuric oxide failed to give any satisfactory result.

The practical inference is that the compound known as sal acetos is by far the best agent for removing either iron-moulds or the disfiguring brown stains produced by Condy's fluids.—J. F. BROWN.

[285.]—SYRUPUS CROCI.—"*A. D.*" wishes to know if any reader has tried the American receipt for Syr. Croci, given page 707 (J. W. Kennedy), and if so, what has been the result?

[286.]—DISPENSING.—I should like to hear the opinion of some of your readers about the dispensing of the enclosed prescription, and what appearance it should present.—GEORGE ELLIS.

℞ Spt. Ammon. Co. ʒss
Liq. Ammon. Acet. ʒij
Quinæ Sulph. gr. x
Liq. Morph. ʒj
Spt. Ether. Nit. ʒiss
Acid. Citric. ʒj
Potass. Bicarb. ʒiss
Mist. Camph. ℥iij
Inf. Gentian. ad ℥vj.
M. ft. mist.
℥j tertia vel 4tis horis.

[287.]—HOTCHKISS' OIL OF PEPPERMINT.—Some years ago I used to buy H. G. Hotchkiss' ol. m. pip. in original bottles, which would perfectly dissolve in s. v. r. 56 o. p. I cannot now procure the same article. That I have lately purchased produces a very milky liquid. This I presume is the result of adulteration with a fixed oil. Can any one tell me how I can procure the genuine article? I shall be glad to learn the experience of some of my brethren in this respect, and how the turbid liquid can be clarified, for ordinary filtration through paper is useless.—PHILOS.

[288.]—VEGETABLE PARCHMENT.—"*Ferrum*" would be much obliged for full particulars for the manufacture of vegetable parchment.

[289.]—SILVERING SOLUTION.—"*Ferrum*" also asks for a recipe for a good silvering solution that will not tarnish.

Correspondence.

**** No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Our Evening Meetings.

Sir,—The opening of a new Session brings before us the return of the monthly evening meetings, together with their ups and downs, success and failure, animation and dulness.

These meetings have always seemed to be *the* weak point in the annual *résumé* presented to us by our worthy Presidents at the close of each official year. From the time of Jacob Bell to the present day, lamentation has followed lamentation, expressed or implied, with unwavering regularity, until the incubus appears to be regarded as an evil to be endured, rather than a difficulty to be overcome.

With the hope of eliciting expressions and practical suggestions from other friends, which may possibly lead to some decided improvement, I venture to bring before your readers opinions which I have long entertained upon the subject.

Two fundamental objections to the present mode of arranging these meetings present themselves to my mind, viz. the time at which they are held, and the subjects chosen for the evening's engagement; vital points, striking at the very root of their existence, and yet I humbly submit radically wrong.

The time at which they are held.—Upon this point I speak as one living beyond the shadow of 17, Bloomsbury Square, but yet not beyond a reasonable walking or riding distance, as inclination may prompt; also old-fashioned enough to consider midnight strolls home undesirable. At present the orthodox time of commencing these meetings is half-past eight, but at the risk of being considered deeply heretical in my views, I venture seriously to question the policy of this established rule.

The argument used in support of the above time is, that an earlier hour would prevent many assistants attending who now avail themselves of the privilege. I must confess I do not precisely understand the ground upon which this theory rests. It certainly cannot be that early closing is so generally adopted in our business that our assistants are, as a rule, at liberty at that hour,—would that it were so,—but unless some such ground exists, I see no reason whatever for the argument. Either those who at present attend, do so in consequence of having that particular evening allotted them in the usual course of holidays, and which they choose thus profitably to occupy; or otherwise their masters allow them the privilege of attending independently of any such holiday. In the former case the evening is the assistant's own, and the difference of an hour would be of little consequence if he really appreciated the meeting; in the latter, I cannot but think that a master who would generously allow his assistant to leave home at half-past seven or eight (I am speaking of those residing at some distance), would as willingly do so at half-past six or seven, if necessary.

But further, we must bear in mind there is the return journey to be accomplished, which again occupies time. Can we expect these young men to be so wrapped up in the delights of pharmacy that no friendly greeting or quiet chat, or perchance some choice specimens, illustrative of the subject discoursed upon, will be allowed to detain them at the conclusion of the meeting? But should they succumb to any such temptation, by what hour may they be expected to arrive at Clapham, Brixton, Holloway or elsewhere? Omnibuses travel but slowly, cabs cost money.

Before leaving this part of my subject, I would add a word on behalf of the masters. Speaking from experience, and I doubt exceedingly whether I am alone therein, the present hour entirely precludes my attending these meetings, much as I sometimes desire to do so, for the simple reason that domestic arrangements would be upset in consequence of the absence of the head of the household. The hour of departure is of no importance, the hour of return is just the reverse.

On these grounds, bearing in mind the utter failure of past years, I would venture to suggest that at least a year's trial should be given to the following alteration. "That the chair be taken at half-past seven and vacated at nine."

The second point to which I desire to draw attention is,—

The subjects chosen for the evening's engagement.—Upon this head I shall be very brief, leaving it to the superior judgment of those more experienced in catering for those supposed to possess some small amount of scientific knowledge; but I must confess a weakness for desiring to see a little extension of the circle of our lecturers, beyond the confines of the Pharmaceutical Calendar. In so saying, I would not for a moment be understood to speak disparagingly of those gentlemen who are so well known to us all, and who take so active and praiseworthy a part in endeavouring to put life into these meetings, but at the same time I should greatly like to see the announcement of lectures or course of lectures by some of the "Stars of Science," upon subjects of general interest to members, but yet somewhat above the preparation of a concentrated iron mixture or blue pill,—things good in their way, but not sufficiently attractive to induce men to leave their homes or take an hour's walk to hear, when they will have the whole thing before them in the space of a few lines in the following week's Journal. Dr. Carpenter's lecture on "The Microscope and its Revelations" was a step in the right direction, and many, I venture to say, would gladly have availed themselves of the opportunity of hearing them, had it not been for the inconvenience of the hour.

But I must conclude, the importance of the subject being my excuse for having occupied so much of your space. Let the suggestions be at least considered; get out of the old time-worn groove; launch forth into fresh fields, and, I am bold to say, our evening meetings may yet be a success.

Edwin B. Vizer.

63, *Lupus Street, Belgravia South,*
September 26th, 1871.

Impurities in Chloral Hydrate.

Sir,—In a discussion on chloral hydrate at the meeting of the Pharmaceutical Association at Edinburgh, attention was drawn to certain impurities, which greatly invalidate the application of the remedy, and hopes were expressed that the matter might be inquired into. I had lately occasion to inspect large quantities of such impure preparation, partly made by foreign manufacturers, but partly also by an English firm. The impurity is exactly the same in both cases,—most likely a result of the manufacturing process, and ought to be capable of being remedied. The impure hydrate gives off dense, strongly acid fumes as soon as the bottle is opened; these fumes affect the eyes and the skin most severely, to such extent, that on manipulating with about a cwt. the epidermis of the operator's hands was completely destroyed.

I purpose sending to the evening exhibition next week a sample of chloral hydrate in this state, and also another which I have succeeded in depriving of the objectionable character above mentioned. The question naturally arises, whether the formation of the foreign compound cannot be avoided. It is not hydrochloric acid, as has been suggested, but an organic chlorine compound (perhaps chlorpicrine) formed together with chloral, and not resulting from a decomposition of the latter. I first was under the impression the fumes were due to a small quantity of chloral, not hydrated, the strong penetrating smell of which is somewhat similar, but solution in water does not take away the strong smell. In a short time I hope to be able to state definitely the nature of this impurity.

Fred. Versmann, Ph.D.

150, *Fenchurch Street, E.C., Sept. 26th*, 1871.

Pharmaceutical Nomenclature.

Sir,—The brother demon to the printer's devil is his compositor. *The Times* told us the other day that "one of the most prominent members of the present Government was kicked out of the camp of advanced liberalism." Imagine the wrath of liberals and the chuckle of illiberals all over the country on reading this statement, and the disgust of both sections on finding that their emotions had been excited through a wretched compositor using a *k* for a *p*; the gentleman had been picked out, not kicked—the compositor deserved the kicking. Then a poetic idea associated with "full blown roses" has been hopelessly destroyed by the words being printed "full blown noses." But such mistakes (there are many on record) are tolerably obvious. Not so one which occurred in my letter on Pharmaceutical Nomenclature which appeared in your last Journal. I am there made to raise the bogey I endeavour to overthrow, by the compositor having put only the first of three consecutive and associated sentences within inverted commas. I am made both to assert and to controvert a position illustrated by 1 and 1 making 3. Your readers will please extend the area embraced by the quotation marks in line 18 of my letter so that they shall not only include the annexed sentence "A nomenclature is only a system for the conveyance of facts" but also the two sentences which follow. JOHN ATTFIELD.

Sir,—When Professor Attfield gave me his list of proposed nomenclature, I instantly, and without a moment's reflexion, read off the column he suggested in correct contracted latin. By "correct" I mean such latin as would be accepted by the Medical Profession in their prescriptions. I therefore, in common with many others, thought the advocated nomenclature good, and likely to be useful. Whether it be an exposition of the latest chemical theories, or *is* common sense adapted to chemical facts, are points over which the Professor may make himself happy. The autumn work of a journalist is heavy, and I have no time between now and November to fight over shadows. JOSEPH INCE.

THE COUNCIL OF THE NORTH BRITISH BRANCH OF THE PHARMACEUTICAL SOCIETY.

Sir,—Mr. Baildon, in to-day's Journal, points out what appears to him to be a discrepancy in one of Mr. Fairlie's letters, but to my mind he has only shown his want of comprehension of the point at issue. As I understand the letter referred to, Mr. Fairlie implied that while in matters social good feelings had been shown and reciprocated externally—possibly having in his mind's eye the late reception of the Pharmaceutical Conference, and other meetings of a social nature, at which members of the trade belonging to the two cities met together—in matters pharmaceutical the Edinburgh brethren had shown an amount of injustice, or at least want of consideration towards other chemists throughout Scotland. My own experience, gathered from observation in both cities, corroborates this; and what I believe Mr. Fairlie wishes is that these external exhibitions of good will should take root in the pharmaceutical world, as well as in the social, in order that some lasting benefit might accrue both to the Society and the trade at large.

I think Mr. Mackay is at fault in accepting Mr. Fairlie's attack on the Council as a slur upon himself or his actions; and as for the supposed implication that the Council have benefited by the grants received from the parent society, it is entirely a gratuitous supposition.

It is well known here that the Committee of the Glasgow Association have refrained from asking a grant of money to help on their education schemes, because, as has been frequently reiterated by the members of the "Council of the North British Branch" in Glasgow, "That it was no use, Edinburgh gets so much money from London that the Council there would not listen to them." The result is, that Glasgow has been forced, to a certain extent, to be pharmaceutically asleep, while Edinburgh is receiving encouragement to prosper with their pharmaceutical education.

I hope that the present discussion will make matters take a turn for the better to all parties, particularly that Scotland may have her due from the London Council, as a distinct and separate body from the English pharmacists, and that Scottish chemists may have something to look to when they become members of the Pharmaceutical Society.

Glasgow, Sept. 23rd, 1871. PH. C.

Sir,—I can fully sympathize with Mr. Fairlie in the position he has found himself in this question, and admire the spirit with which he has struck at the root of the matter against such influence as it is known the members of this Council can command. The several gentlemen who have replied to him have taken a delight in parading before the readers of the Journal the fact that he has only recently become a member of the Pharmaceutical Society, but this, in my opinion, says the more for his fortitude; and I hope he will return the taunt in the manner the great Pitt did when taunted by Walpole on account of his youth, showing that though he has the misfortune to be a young member of the Society he has not the greater misfortune of having some crotchety and old-fashioned notions in his head which nothing evidently will eradicate.

Mr. Fairlie deserves the thanks of the "Outsiders" for having opened up a subject which may ere long, I hope, open up the doors of the Pharmaceutical Society to all desirous of entering it; so long as this self-elected Council is allowed to manage the affairs of the Society in Scotland as they choose, so long will the most active men, connected with the drug trade, remain passive on-lookers of what they can only term a "myth."

AN ON-LOOKER.

Edinburgh, September 25th, 1871.

ACTION OF HEAT ON PROTOPLASMIC LIFE.

Sir,—Holidaying accounts for my not seeing your issue of 2nd inst. till to-day, when the paper on "The Action of Heat on Protoplasmic Life" caught my earnest attention, because that was a subject of interesting discussion in my quarters here a few days ago, and in entire ignorance of the valuable experiments of Mr. Crace-Calvert.

At said discussion I brought forward a fact which you may think worthy of notice, as when attention is directed to the particular case abundant and important corroboration may be adduced.

The case I adduced was, that during the late civil wars in the United States my sister had charge of, in Mississippi, an hospital for the sick and wounded, and that one of the most dreadful things she had to deal with was the destruction of the germs of vermin in the clothes of the soldiers brought under her supervision and treatment. Ten hours' consecutive boiling in water failed to destroy these germs. Incubation seemed only to have been quickened, for in the act of drying, or shortly thereafter, vermin swarmed from the hems of the boiled clothes, and nothing short of a scorching heat applied over the hems, by means of a smoothing iron, destroyed the vitality of the germs.

Millport, Sept. 22nd, 1871. A. W. P. S.

THE DRUG TRADE IN CANADA.

Sir,—I shall feel obliged if any of your readers, either from residence in Canada or from knowledge of the country through other sources, can give me reliable information as to the state of the drug trade there.

I wish to ascertain exactly what is the usual rate of remuneration for assistants in drug stores or as dispensers to medical practitioners; whether or not the certificates of our Pharmaceutical Society are recognized; what success might reasonably be expected by a gentleman going into business on his own account; and also, whether or not the Canadian Pharmacopœia differs much from our own?

The *amor patriæ* is very strong in me; but as I know by experience that the condition of chemists in England, in a small way of business, is very wretched, I am desirous of finding in another land an adequate return for outlay of capital and persevering industry.

September 11th, 1871. JATEORRHIZA.

Schools of Pharmacy.—We have received a letter from Mr. Cooper, of York, suggesting that notices of the schools of pharmacy in the United Kingdom should be published in the PHARMACEUTICAL JOURNAL in a way similar to that in which the medical papers publish notices of the medical schools. We shall be glad to carry out this suggestion if those connected with provincial schools will favour us with information respecting them.

"*Truth.*"—The character is "Leaves alternate or opposite;" the latter word has been accidentally omitted.

"*Ignis Fatuus.*"—(1.) The fourth edition, published in 1851. (2.) No. (3.) The extracts may be taken from any part of the Gallic War.

E. T. F.—The works mentioned may be obtained through any respectable bookseller.

Lloyd Rayner.—The publication of your letter would raise questions which we do not think it is the province of this Journal to discuss. The report of the proceedings at the police court was taken, as stated, from the *Daily News*, and our remarks were based upon the statement made by your own solicitor.

"*Chemicus.*"—Your letters have been handed to the officers of the Conference, from whom you will probably hear at the termination of the vacation. A list of the works recommended by the Board of Examiners may be had by applying to the Secretary, 17, Bloomsbury Square.

COMMUNICATIONS, LETTERS, etc., have been received from Messrs. J. Edwards, J. Mackay, T. Cooper, S. W. R. Nevin, C. Umney, A. Shillcock, J. R. Summers, A. Field, W. H. Beaumont, J. B. B., E. H. S., "Truth," "A Minor Associate," "Scrutator," "East Wind," "Analno."

OIL OF ANDROMEDA LESCHENAULTII.*

. . . Early in 1867 Mr. M'Ivor requested me to examine an essential oil which he had obtained from a very common hill plant, the *Andromeda Leschenaultii*. I did so, and was enabled to identify the oil as methyl-salicylic acid, and almost identical with the Canadian oil of wintergreen.

Oil of wintergreen is an object of some slight commerce, being used in perfumery, and occasionally in medicine as an anti-spasmodic. The oil from this Indian source contains less of the peculiar hydrocarbon oil, which forms a natural and considerable admixture with the Canadian oil, and therefore is somewhat superior in quality to the latter. The commercial demand for the oil is not, however, considerable enough to make its occurrence in India of much direct importance.

It occurred to me in 1869 that methyl-salicylic acid would, however, under suitable treatment, furnish carbolic acid according to a decomposition described by Gerhardt. After a few experiments I was successful in preparing considerable quantities of pure carbolic acid.

The method of manufacture is as follows:—

The oil is heated with a dilute solution of a caustic alkali, by which means it is saponified and dissolved, methylic alcohol of great purity being liberated. The solution of the oil is then decomposed by any mineral acid, when beautiful crystals of salicylic acid are formed. These are gathered, squeezed, and dried. They are then mixed with common quicklime, or sand, and distilled in an iron retort; carbolic acid of great purity and crystallizing with the greatest readiness, passes into the receiver.

This acid is equal to the purest kind obtained from coal tar, and employed in medicine. I exhibited a specimen of it at the Neilgherry Exhibition in 1869. It, of course, possesses all the qualities which have rendered this substance almost indispensable in modern medical and surgical practice.

I had hoped, from the inexhaustible abundance with which the plant grows on the Neilgherries, that the carbolic acid from this source could be prepared at less cost than that imported. I have not yet had an opportunity of working on a large scale with an itinerant still, as would be necessary for its cheapest production; but from some calculations I have lately made, I am led to think it can scarcely be prepared for less than the price of that procured from coal-tar. The purest kinds from the latter source cost four shillings a pound; I estimate the cost of that from this indigenous source at from rupees 2. 8 to rupees 3. 8 (5 to 7 shillings) per pound *in this country*.

The carbolic acid from the same source has certain advantages over the coal-tar acid, consequent on its extreme purity. It is less deliquescent, and cannot possibly be open to the suspicion of contamination with certain other products of coal-tar which possess injurious qualities. This occasional suspicion, indeed, has led to the introduction of the costly thymol in France, as a substitute, in delicate cases, for carbolic acid.

In conclusion, I am led to the belief that it would not be advisable to prepare carbolic acid from this singular source, when the comparative cost shows that the gain must be very small or non-existent. But it appears to me well worthy of record, that should circumstances render the supply of the English product difficult or uncertain, as in the case of war, or the English price increase, a practically inexhaustible source exists in this country from which this indispensable substance, in its purest state, can be obtained at a slight enhancement of the present price.

* Extract from letter from J. Broughton, Esq., Government Quinologist, to the Secretary to Government Revenue Department, Fort St. George, dated Ootacamund, 9th January, 1871.

CERTAIN PROPERTIES OF THE TUTU PLANT (CORIARIA RUSCIFOLIA).*

BY H. G. HUGHES, M.P.S., HOKITIKA.

During the past year I have devoted my leisure to the investigation of the properties of the tutu plant, and communicated my results from time to time to Dr. Hector and Mr. Skey, who kindly assisted me with their criticisms. The following paper embodies a brief account of my experiments, which circumstances have unfortunately prevented my completing as I wished to have done.

About three-quarters of a pound of the fresh ground shoots were treated with successive quantities of distilled water slightly acidulated. After filtering and adding the acetate of lead in excess, it was submitted to the action of sulphuretted hydrogen, again filtered and evaporated to the consistency of an extract. This extract was well washed with successive quantities of alcohol, filtered, evaporated and ammonia added, when a precipitate resembling kermes mineral was separated (resinous matter). It was still further concentrated, distilled water added and again filtered from precipitate; evaporation continued, again treated with alcohol, filtered and evaporated to a syrupy consistence. On cooling, a few crystals formed with difficulty. This thick solution possessed very active properties, and a quantity of it, certainly not more than one-twelfth of a grain (I was scarcely aware of having tasted it), in five minutes' time produced a most disagreeably irritating sensation in the throat, extending to the stomach, with pain across the region of the stomach and accompanied by nausea. In a quarter of an hour's time vomiting came on, which continued more or less for two hours. Very unpleasant sensations continued for two hours more, when, after great flushing of the face, with all but intolerable heat, the effects passed away. Of course, not anything was taken to counteract the poison. On the addition of a little ether to the thick solution, a quantity of acicular crystals immediately made their appearance, but became redissolved as the ether slowly volatilized. The whole was afterwards shaken up with ether, the ethereal solution separated. Upon spontaneous evaporation, three or four drops of a fine yellow-coloured fragrant oil were left as residue. The fragrancy increased upon the application of a gentle heat. Upon evaporating the thick alcoholic solution, crystals of supposed alkaloid formed. These were redissolved and recrystallized until their solution in alcohol was perfectly colourless. During the final evaporation of an alcoholic solution, an accident

* Read before the Wellington Philosophical Society, November, 12, 1870.

occurred, and they were lost, having been burnt. The residue was black and charred (carbonaceous).

The experiment was made with the view of isolating an alkaloid. A resin was separated (the powder before mentioned); it was combustible, burning with a clear flame; also, a bright yellowish-coloured fragrant oil. This fragrant oil was also obtained by distilling the expressed juice of the fresh and succulent young shoots. It comes over with the water, rendering it very fragrant. A solution of sodium chloride added to this fragrant water (it being previously shaken up with a little potash) immediately curdles it.

About three ounces of leaves were exhausted by percolation with precipitate and benzine successively. The benzine solution contained nothing of importance. The alcoholic solution was treated in the same manner as that of the young shoots; it contained the fragrant oil, it was also poisonous, but when lime was substituted for the acetate of lead, no alkaloid was found, and altogether it was a most unsatisfactory experiment. I thought the principles were lost.

Three-quarters of a pound of the bark was next examined. It was in a bad condition, and had been taken off a part of the trunk of a tree near the ground; it had been submerged during a flood of the Hokitika river. This was treated in the same manner as the young shoots, with the exception that lime was used, but yielded nothing besides a trace of the fragrant oil and some resinous matter.

Some of the seeds of the fruit (three-quarters of an ounce), all that could be obtained, the season being so far advanced, were macerated in alcohol and evaporated. To this alcoholic extract a little powdered lime was added and mixed. It was then well washed with spt. vin., ether and chloroform in succession. Neither of the latter two yielded anything upon spontaneous evaporation. The alcoholic solution evaporated; the residue was treated with acid sulph. dil., filtered, and pot. carb. added in excess caused a flocculent precipitate. The solution separated, the precipitate was treated with alcohol and filtered. As the solution became more concentrated, a heavy olive-coloured oily fluid separated. Some shoots of the tree gathered 3rd December, 1869, yielded this oily fluid. It is of a most poisonous nature, half a drop administered to a terrier exciting most severe symptoms (vomiting and convulsions). After further concentration, ether was added, when a yellowish precipitate formed, the oily fluid separating of a clear olive-green colour. As the ether volatilized, the precipitate was redissolved by the alcohol; the oily fluid remained. Chloroform added caused a pure snow-white precipitate, which floated, the oil still remaining unaffected. It was then separated from the precipitate, dissolved in alcohol and filtered. Upon evaporating spontaneously, it deposited feathery crystals of a dingy colour (impure or contaminated with the oily fluid). Before all the alcohol had evaporated, chloroform always gave a pure snow-white precipitate. The crystals were extremely deliquescent. I thought this oily-looking fluid was a liquid alkaloid similar to conia. It was soluble in alcohol, but insoluble in both ether and chloroform. The alcoholic solution of this oily substance and white alkaloid possessed very energetic properties,—an all but inappreciable quantity bringing on, almost immediately, a very distressing suffocating sensation, and an unpleasant feeling of roughness and insensibility of the palate. Not any of the fragrant oil was found.

Respecting the opinion that the oily-looking fluid is a liquid alkaloid, and at least holds in solution a salt (supposed alkaloid), the following may tend a little to uphold it.

It is very remarkable that this oily fluid is perfectly insoluble both in ether and chloroform, and soluble in alcohol and a mixture of alcohol and water; and whatever the poisonous principle or principles may be, that slacked lime made into a thin cream with water instantly destroys it or them, with or accompanied by the evolution of ammoniacal vapour. The fragrant oil is soluble in ether and chloroform, and I imagine it to possess emetic properties only, as will be seen when treating of the antidote.

Moreover, a portion of alcoholic extract was mixed with distilled water introduced into a pint retort and heated in an oil-bath. The extract was fragrant, and as a consequence, the fragrancy of the essential oil passed over with the first quantity of water as was intended and was removed. When the extract thickened, a good heat being applied (350° to 400° F.), I found snow-white acicular crystals sublimed in a ring all round the neck of the retort, two inches from the stopper. Watching how they formed, I saw drops of oily fluid of an olive-green colour (the same oil apparently as that before mentioned), settling very curiously (as drops, I suppose owing to the repulsion of the glass from the high temperature employed, and the low degree of volatility of this oil), on the neck of the retort, which being very hot, these drops, as they slowly volatilized, left snow-white acicular crystals, and similarly to those before mentioned, extremely deliquescent, and very soluble in alcohol. Some were preserved, mounted and examined with the microscope, and I thought they were oblique rectangular prisms. As far as I was able to judge, these were exactly similar to those before described as having been lost. I imagine that the charring of the first ones, and the extreme deliquescence of these, altogether set aside the opinion of their being ammonium chloride, which was suggested to me by Mr. Skey. The crystals taken from the neck of the retort gave precipitates with the iodide of mercury and tannic acid respectively. An unused portion of the extract experimented upon, was treated with slacked lime (it was the first time that slacked lime was used), when strong ammoniacal vapour was discharged, and the extract became a solid mass. Suspecting the alkaloid, or whatever it was, to be destroyed, just as anticipated, although great and unusual care was used towards isolating the various principles, yet not a trace of anything was found, as was the case with the other portion subjected to distillation with water. It was from the consideration of this strange reaction that it occurred to me that lime would be of avail in cases of poisoning.

From another quantity of the shoots of the tree, crystals were obtained of a very mixed character, which gave precipitates with iodide of mercury, also the bichloride of mercury. These had a very peculiar taste, saline and bitter and very biting, and were poisonous, half a grain causing slight nausea and exciting symptoms similar to the oil, but milder.

In all my experiments, the ether, alcohol, chloroform, etc., used, were the commercial articles.

(To be continued.)

Chapters for Students.

CHEMICAL NOTES TO THE PHARMACOPŒIA.

BY WILLIAM A. TILDEN, D.SC. LOND.

DEMONSTRATOR OF PRACTICAL CHEMISTRY TO THE PHARMACEUTICAL SOCIETY.

Plumbi Acetas.—Oxide of lead is dissolved in acetic acid, used in slight excess, and the salt made to crystallize by evaporating the solution. Sugar of lead occurs in crystalline masses, having a sweetish astringent taste and an acetous odour; it is soluble in spirit and in water. [§ The solution slightly reddens litmus, gives a yellow precipitate (PbI_2) with iodide of potassium, and is precipitated white ($PbSO_4$) by sulphuric acid, acetic acid being set free.] It is hardly liable to any impurity.

Plumbi Carbonas.—Though of small importance pharmaceutically, carbonate of lead occupies, as a pigment, a very prominent position. It is made largely by a process which is but little varied in different countries. The principle upon which it depends is found in the fact that a mixture or compound of oxide and acetate of lead is converted by carbonic acid gas into a mixture of carbonate and neutral acetate of lead. Practically, metallic lead is exposed to the simultaneous action of acetic acid vapour, atmospheric oxygen and carbonic acid, with the assistance of a slightly elevated temperature. The carbonic acid is supplied very commonly by the fermentive decomposition of tan and stable manure; or sometimes by the combustion of coke or charcoal. It may fairly be supposed that the acetic acid and oxygen coat the metal superficially with a basic or oxyacetate, which, as soon as formed, is transformed by the carbonic acid into carbonate, and that this kind of action continues till the whole of the lead is converted.

White-lead is adulterated with chalk, sulphate of barium and other substances.

[§ Tests.—Soluble with effervescence in diluted acetic acid without leaving any residue. The acetic solution, when treated with excess of sulphuretted hydrogen, boiled and filtered, gives no precipitate with oxalate of ammonia.]

White-lead is a hydrate-carbonate, but varies in composition; it is often $2PbCO_3, Pb(HO)_2$.

Plumbi Iodidum, PbI_2.—Solutions of nitrate of lead and iodide of potassium are mixed together, and the bright yellow precipitate collected, washed and dried.

$$Pb(NO_3)_2 + 2KI = PbI_2 + 2KNO_3.$$

Although the Pharmacopœia directs the salts to be dissolved in water by the aid of heat, the solutions should be allowed to cool before mixing or the precipitate will sometimes be too distinctly crystalline. Iodide of lead may readily be crystallized from boiling water in scales which have the lustre and appearance of gold.

Plumbi Nitras, $Pb(NO_3)_2$.—An anhydrous salt, crystallizing in regular octahedra, which are usually opaque, and prepared by dissolving lead,—

$$3Pb + 8HNO_3 = 3Pb(NO_3)_2 + 4H_2O + 2NO,$$

or its carbonate or oxide in dilute nitric acid.

$$PbO + 2HNO_3 = Pb(NO_3)_2 + H_2O.$$

The solution gives the usual reactions of lead compounds and of nitrates.

DETERMINATION AND CHARACTERISTICS OF CITRIC ACID.

BY H. KÄMMERER.

Soluble citrates mixed with acetate of baryta, either hot or cold, produce a white amorphous precipitate, being $3\,BaO, 2\,C_{12}H_5O_{11}, 3\,Ho, + 14$ aq.

If, after precipitation, an excess of acetate of baryta be added, and the mixture heated in a water-bath, the precipitate becomes heavy and granular, it loses one-half of its water of crystallization, and has now the composition $3\,BaO, 2\,C_{12}H_5O_{11}, 3\,Ho + 7$ aq.

The presence of other organic acids does not interfere; the granular salt is absolutely insoluble in water, and citric acid may thus be easily determined. If the solutions are very dilute they must be concentrated by evaporation, after additions of acetate of baryta, or the precipitate will consist of crystalline needles containing only 5 aq.—*Zeitschr. für Analyt. Chemie*, viii. p. 298.

Inspection of Weights and Measures.—Under the Act 5 & 6 William IV. all persons are liable to have their weights and measures inspected who are proprietors of any "shop, store, warehouse, stall, yard or place whatsoever, wherein goods are exposed or kept for sale, or weighed for conveyance or carriage." A Bill for amending and consolidating the laws relating to weights and measures was prepared by the Standard Weights and Measures Department, and submitted to the consideration of the Government last session; the Bill, however, was not limited to consolidation with unquestioned amendments, but proposed the permissive introduction of the metric system, and was left among the "good intentions" of the Session. The Warden of the Standards observes that it deserves consideration whether the class of persons liable to inspection of their weights and measures should continue to be defined in the above terms; these are now construed as not including wholesale dealers, and it might be a matter of just complaint on the part of retail dealers that, while they are themselves subject to the visits of inspectors of weights and measures, the wholesale dealers from whom they must buy their goods are not subject to such inspection. The absence of authoritative instructions to the inspectors specifying more exactly the trades subject to inspection has led to many traders not having been subjected to it. For example, chemists and druggists, pawnbrokers, etc., using troy weights, have hardly ever had their weights inspected. An attempt has been made by the department to ascertain, with the aid of the census returns of 1861, the number and description of traders, manufacturers, etc., using weights and measures who are not liable to inspection under the existing law. A list has been made out from which it would appear that out of a total population of 29,000,000 in the United Kingdom in 1861, 1,333,679 persons were engaged in trades subject to inspection of their weights and measures, and 3,627,988 persons were engaged in trades and manufactures requiring the use of weights and measures who are not liable to inspection. Among the persons not liable to inspection are cotton, woollen, linen and silk manufacturers, tailors, blacksmiths, carpenters, farmers, dressmakers, coopers, cigar and tobacco manufacturers, candlemakers, copper manufacturers, engine and machine makers, flannel manufacturers, felt manufacturers, opticians, outfitters and clothes dealers, picture-frame makers, plated-ware manufacturers, saddlers, typefounders.—*Times*.

The Lemon-tree Disease.—Her Majesty's Consul at Messina reports that the disease of the lemon-tree continues its ravages, and nothing has yet been discovered to arrest its progress. Last year the oranges, but more particularly the lemons, were badly tainted, and a large proportion being unfit for shipment, were converted into juice or essence.

THE EXHIBITION AT THE EVENING MEETING.

In accordance with the intimation of the Council of the Pharmaceutical Society as to the exhibition of any articles of novelty, or otherwise, of special interest to pharmacists on the occasion of the Inaugural Meeting of the session, a space was set apart in the Society's museum for this purpose. Some of the articles exhibited were exceedingly interesting.

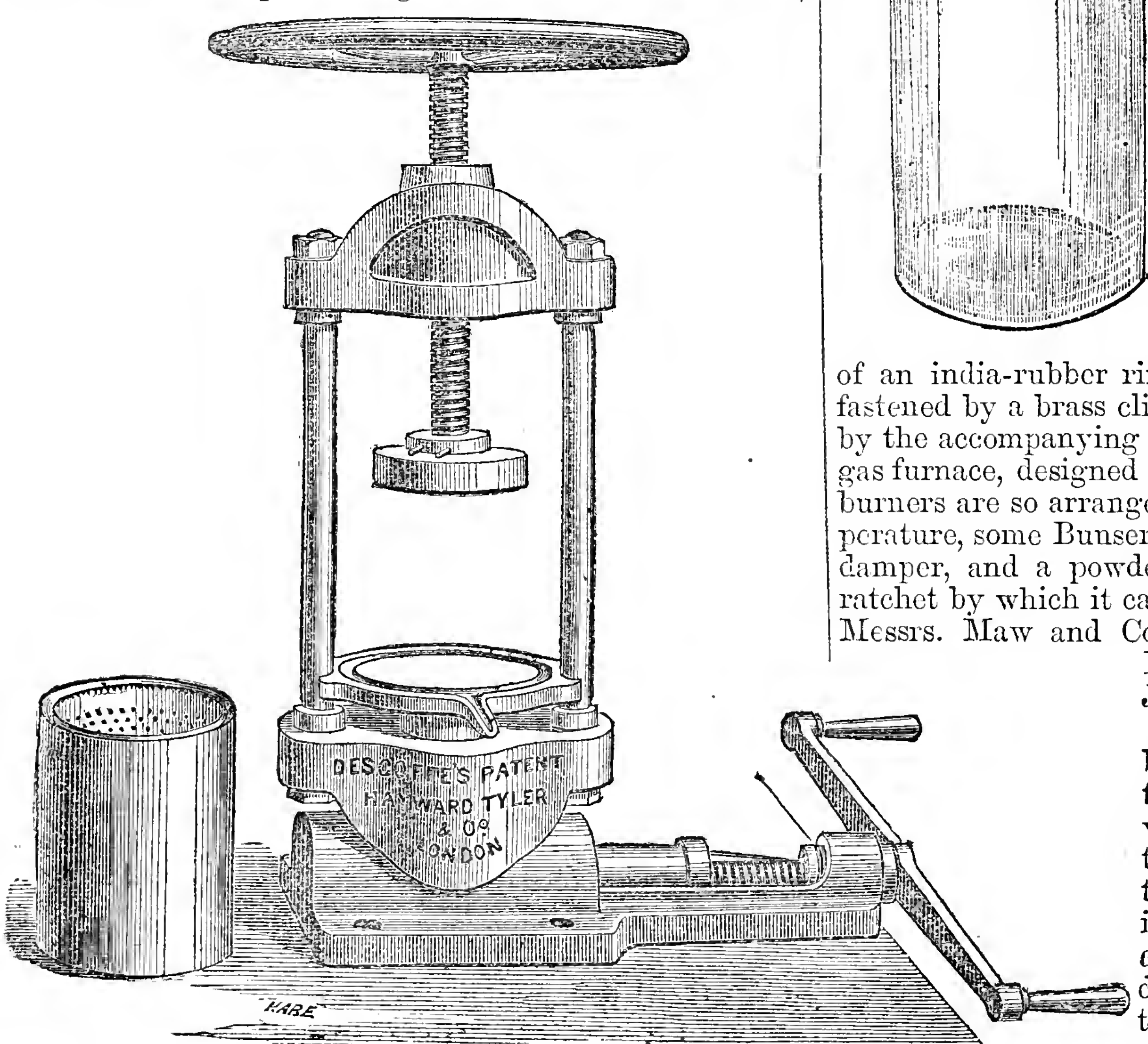
A principal feature was the exhibition of the donations presented to the museum since the last meeting of the previous session, a list of which will be found at p. 287. Prominent among these were the collection of Chinese materia medica, of more critical value than such collections usually are, since it includes the identical specimens described in Dr. Porter Smith's work recently noticed in this Journal; a few specimens of Indian drugs, principally officinal in the Indian Pharmacopœia; and the specimens of oil and carbolic acid from *Andromeda Leschenaultii*, prepared by Mr. Broughton. There was also a specimen of the much-lauded and much-abused condurango.

A specimen of the impure fuming chloral hydrate referred to by Dr. Versmann in his communication to this Journal last week, was exhibited by that gentleman; also specimens of the purified salt in crystals.

Mr. Williams sent for exhibition one of Fletcher's blowpipe lamps, manufactured by Messrs. Horne and Thornthwaite. In this the flame is delivered from a horizontal pipe, round which is coiled a small iron tube, ending at the mouth of the gaspipe. Through this air is blown, which is heated in its passage by two small Bunsen jets beneath.

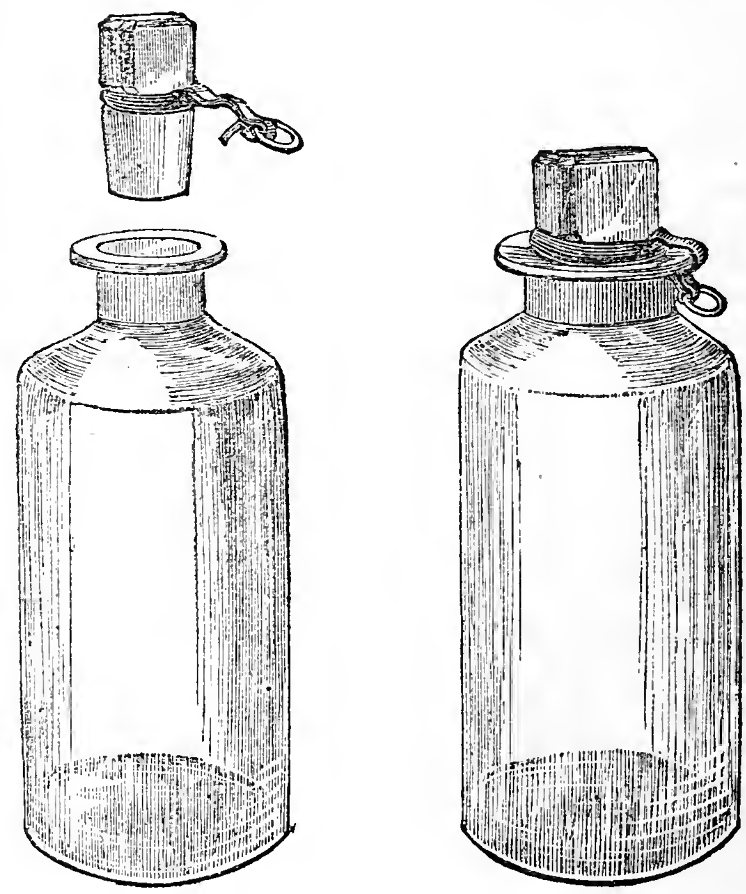
A Compound Hydraulic Press, suited to small laboratories, for extracting tinctures, etc. and for all purposes where hydraulic pressure is required (Desgoffe's patent), was exhibited by Messrs. Hayward Tyler and Co.

The press is provided with a circular table, round which is a groove conducting to a small spout in front. On this table is placed a galvanized iron double box,



8 in. diameter by 10 in. deep (shown standing by the side of the press), the inner casing being perforated with holes. The movable mullet of the press, worked by a powerful screw and hand-wheel, fits accurately into this box, and travels nearly its whole depth. When the box has been charged, the pressure is first applied with the screw. If moderate pressure only is required this will be sufficient; but if great force is to be used the hydraulic press is put into action. This consists of a ram 4 in. in diameter, which raises the table against the mullet. Below the 4 in. ram, and entering the same chamber in which it works, is a second ram, about $1\frac{3}{4}$ in. diameter, forced inwards by a screw and hand lever. As this enters the chamber it will be seen that, on the principle of the hydraulic press, it displaces the water, and forces out the press-ram. A pressure of six tons is stated to be easily obtained, due to the difference in the diameters, multiplied by the power of the screw. The advantages claimed are, that there are no valves to get out of order, and that the power is applied continuously.

Messrs. Maw, Son and Thompson exhibited several articles. Pindar's pill machinery attracted considerable notice. It consists of a "piping press," into which the pill mass is placed and forced by screw pressure through holes in the bottom in long pipes, and a rotary machine consisting of two grooved cylinders, through which the "pipes" are passed and fall into a tray below in a pilular form. The registered stopper-guard consists



of an india-rubber ring passing round the stopper, and fastened by a brass clip to the lip of the bottle, as shown by the accompanying engraving. Other objects were a gas furnace, designed by Mr. T. B. Groves, in which the burners are so arranged as to give a great range of temperature, some Bunsen burners fitted with trivets, a label damper, and a powder-folding apparatus fitted with a ratchet by which it can be adapted to any size required. Messrs. Maw and Co. also exhibited one of Young's Poison Cabinets, described in this Journal, Vol. I., p. 876.

Messrs. Frazer and Green exhibited a bottle-guard designed by them. It consists of wire-work which fits over the bottle, so that in the event of its bursting while bottling waters, the glass is retained inside the wire casing. They also exhibited some poison bottles, the distinguishing features in which are the colour and the word "poison" printed beneath the label.

Messrs. Kay Brothers, of Stockport, exhibited a new oil-bottle invented by Mr. Sagar, the advantage claimed for which is that it is so constructed that every drop of oil runs back into the bottle, and thus avoids the waste, mess and dirt which attend the old bottle on the shelf.

The Pharmaceutical Journal.

SATURDAY, OCTOBER 7, 1871.

Communications for this Journal, and books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

FUTURE PHARMACEUTICAL EDUCATION.

ALTHOUGH the Inaugural Address that is to be found in another part of the Journal was mainly devoted to a retrospective view of certain prominent features in the past life of our Society, one point was briefly referred to, which needs no power of second sight to be recognized as one of great importance in regard to the future, and demanding immediate consideration. We refer to the educational action of this Society. From the first, education has been the fulcrum upon which the Pharmaceutical Society has sought to exercise its influence in raising the character of the trade; and it is certain that the maintenance of a high educational standard is the only basis for advancement in the position of the pharmaceutist. That success has attended the efforts of the Society, we believe it would be unnecessary to insist upon, but much still remains to be done in this direction; and though hitherto, while the Society was a mere voluntary association, there was nothing inappropriate in its exercise of educational functions, the very success it has achieved has been of such a nature as to render those functions increasingly anomalous and their further continuance impossible.

The recognition of the Society as the examining body by which pharmaceutical competence was to be tested and certified, though that legislative act was to a great extent only prospective in its bearing, was none the less to be regarded as a notice that at some future time there must be an end to that school of pharmacy which has hitherto been the particular pride and glory of the Society. Consequently the members of the examining body have been gradually taking higher position among the Society's officers, and in that respect taking precedence of the professorial body. While this state of transition still prevails, it is imperative on all who have the interests of British pharmacy at heart to consider well what steps may be taken for securing to their successors that efficient means of instruction which will doubtless become even more indispensable than it is at present.

Closely connected with the question as to the future of the chief school of pharmacy, is the wider and perhaps even more important subject of provincial education, and we propose placing before our readers next week a paper on this subject, which we hope will excite an expression of opinions and criticism by many who have thought on the subject, and are able to point out the peculiarity of local circumstances that would have to be dealt with.

THE LONDON INSTITUTION.

WE have previously noticed the efforts being made by the Managers of the London Institution to make its resources useful in promoting scientific knowledge, and we are glad to learn from the announcement of Lecture arrangements for the coming season in the last number of the Journal of the London Institution, that these efforts are still to be continued. A course of lectures, on Elementary Physiology, will be delivered by Professor HUXLEY, another course of eight lectures on Elementary Chemistry will be delivered by Professor ODLING, and other courses of six lectures on Elementary Music and Elementary Botany will be delivered by Professor ELLA and Professor BENTLEY. Mr. P. L. SIMMONDS is also to give two lectures on the Raw Materials of our Manufactures, and, during the Christmas holidays, Mr. BROUGH will give a course of lectures on the Philosophy of Magic. Another interesting feature of the projected arrangements is the evening class for practical instruction in chemistry, under the direction of Professor ARMSTRONG. This is to commence early in November. The course will consist of twenty-five lessons, from six to half-past eight, and to many who cannot otherwise acquire a knowledge of chemistry, it will be an opportunity they would do well not to neglect.

OIL OF ANDROMEDA LESCHENAULTII.

AMONG the most interesting of the specimens presented to the Museum of the Pharmaceutical Society, and exhibited at the opening meeting, were those of the oil and carbolic acid, prepared by J. BROUGHTON, Esq., the Indian Government Quinologist, from the *Andromeda Leschenaultii*. The oil is almost identical with that obtained from the American species of Andromeda (*Gaultheria procumbens*), and we are inclined to be more hopeful than Mr. BROUGHTON, that if the oil could be produced at a sufficiently cheap rate it would meet with a sale. Certain it is that oil of wintergreen has been in great request by certain manufacturers of late. The extract from Mr. BROUGHTON's report,* kindly placed at our disposal by Dr. FORBES WATSON, will be of interest to our readers.

* Printed at p. 281.

POISON BY POST.

During the recent investigation into a charge of poisoning at Brighton, uncontradicted evidence was brought forward that some person or persons had forwarded anonymously packages of poisoned food by the ordinary means of conveyance, and that in one or two instances the recipients were sufficiently incautious to allow them to be eaten. It might have been hoped that these instances were exceptional, but Professor Attfield, in a letter to the *Times*, mentions two others which have come under his notice. We republish the letter because the warning contained in it is evidently necessary, but we demur to the inference drawn by him, for we think that where there is sufficient malice or mischief present to prompt to such an action, the difference of a few pence in the postage would hardly stay the hand. The suggestion that because the cases mentioned by Professor Attfield came under his notice during the existence of the late sample post regulations, therefore the caution becomes so specially necessary upon the introduction of a new parcels post, appears to have a slight tinge of the *post hoc propter hoc* style of argument.

"Just before the public was deprived of that short-lived boon, the old parcel post, a lady received by its means a few ounces of tea. Thinking the tea was sent for purposes of advertisement, and that a letter would follow, she, no doubt injudiciously, allowed the sample to be used at table. Every person who joined in that meal was more or less seriously ill, the tea, as proved by analysis, being dexterously impregnated with poison. The name of the latter, and the process by which evidently it had been introduced need not be disclosed, for I think it undesirable to add to the knowledge which the malicious only too easily gain from newspapers.

"The above circumstance I should have published at the time it occurred, but hoped it was a solitary case, and that another would not arise, but a similar one under the sample post has since come to my knowledge, and recently a still more serious affair of poisoned parcels of food has agitated the minds of all the inhabitants of a large southern town. It becomes my duty, therefore, on the re-introduction by the postal authorities of what is in effect a new parcels post to caution heads of families against using articles of food that may reach them through a channel in which all responsibility as to quality, purity, or harmlessness is lost.

"This letter need not occasion alarm or annoyance to any one. The householder is forearmed if forewarned. The dealer in food who proposes to advertise by help of the new postal tariff will see that, as the local guarantee of shop and person cannot travel with his samples, indiscriminate distribution of the latter is of questionable advantage. To the Post Office itself any profit on the carriage of a few specimens of such things as tea and cocoa is too small to be worthy of notice."

We learn from the *Times* that the Committee of Delegates representing the various districts abutting on the Thames, which, at the suggestion of the Privy Council, was organized a short time since for the purpose of instituting a systematic inspection of all vessels entering the Thames, and to arrange other joint action in view of the apprehended visitation of cholera, is now threatened with disruption, in consequence of the representatives of the East London parishes having very generally declined to make any contribution unless the assessment is based on the rateable value of the whole metropolis. This course has been approved by their constituents. An opinion has been expressed that the staff of officers is not large enough so to carry out the quarantine regulations of the Custom House as to prevent the importation of epidemic disease; and it is argued that as the expenses would be incurred for the benefit of the whole community, therefore the whole metropolis should bear the cost.

In connection with the East London district, we are pleased to notice that, in advertising for a person to fill the office of Inspector of Nuisances, the Poplar District Board of Works has evinced a recognition of the necessity of special qualifications for the right performance of the duties. It is stipulated that candidates shall possess a competent and practical knowledge of applied chemistry and mechanics, and it is intimated that they will undergo examination as to their qualifications by the medical officers of the Board. The person appointed will be required to devote the whole of his time to the carrying out of the several Acts, and in return the Board offer a salary of £150 a year. Applications are to be made before the 12th instant, and further information may be obtained on application to the Clerk of the Board.

The discovery of extensive salt mines at Stassfurt has created a mighty industry, and has naturally led to boring experiments in other parts of Germany, some of which have been rewarded by extraordinary results. Early in 1867 operations were commenced at Sperenberg, about twenty-five miles from Berlin, and after passing through 280 feet of gypsum and anhydride, rock salt was found, in October. A continuous layer of this has been bored through for a thickness of 2962 feet, the total depth reached at the end of last year being 3242 feet. In August, 1870, notwithstanding the war, another mine was sunk at a distance of 2000 feet from the first; and here, again, rock salt was reached at a depth of 369 feet. This Sperenberg salt deposit appears, therefore, to be by far the most extensive known. At Segeberg, in Holstein, rock salt has also been discovered at a depth of 940 feet; a stratum of salt, 24 feet thick, had already been passed through, when the boring tools broke, and it became necessary to start afresh. This was done at half an hour's distance, and salt was found at a depth of 310 feet, remarkable for its purity. From these preliminary trials, made at great distances, it appears evident that Germany may, in a short time, prove to be the country richest in salt, and these discoveries cannot fail to exercise a marked influence upon industry. All the salt mines are at present in the hands of the Government, the salt tax yielding a considerable share of the revenue; and it remains to be seen what effect in this respect the discovery of these enormous natural riches will have.

Transactions of the Pharmaceutical Society.

MEETING OF COUNCIL.

October 4th, 1871.

MR. A. F. HASELDEN, F.L.S., PRESIDENT, IN THE CHAIR.
MR. EDWARDS, VICE-PRESIDENT.

Present—Messrs. Atherton, Betty, Bottle, Carr, Frazer, Groves, Hills, Mackay, Reynolds, Savage, Shaw, Smith, Stoddart, Williams and Woolley.

The minutes of the last meeting were read and confirmed.

The Report of the Finance Committee was presented, showing on the General Fund Account a balance in the Treasurer's hands of £735 1 9

And submitting for payment sundry accounts for rent, salaries, etc., amounting to £951 6 7

On the Benevolent Fund Account a balance of £290 10 1

Resolved—That the Report of the Finance Committee be received and adopted, and payments made.

The Report of the Benevolent Fund Committee having been read, it was

Resolved—That the Report be received and adopted. The Treasurer was requested to pay the several annuities to Christmas next.

A grant of twenty pounds was made to the widow of a deceased member.

The Secretary said that in the year 1865 the Council had paid a sum of money from the Benevolent Fund for the entrance of an orphan boy named Bentley into the British Orphan Asylum. The boy had now left the school, and the case was mentioned in the hope that some members of the Council might know or hear of some opening in which he might earn his livelihood.

An application was made for help by a widow in distressed circumstances, but as her husband was not registered at the time of his death, the Council much regretted that they were unable to give relief.

The Report of the Provincial Education Committee having been read, it was

Resolved—That a Register of Pharmaceutical Chemists and Chemists and Druggists be prepared and published according to towns and counties, and that the towns be arranged alphabetically, with the amount of population in each case.

Some discussion arose as to the compliance by the Nottingham Chemists' Association with the terms of the grant, and sufficient explanation was given by Mr. Atherton.

A grant of £10 was made to the Leeds Chemists' Association.

Resolved—That the Report be received and adopted.

The Report of the Parliamentary Committee having been read, it was

Resolved—That the Report be received and adopted.

Some cases of infraction of the Pharmacy Act were fully considered and further inquiry directed to be made.

Resolved—That the following having passed their respective Examinations, be elected Associates of the Society:—

MINOR.

Wilson, Thomas .... Blackheath.
Woods, Joseph Henry.......... Warrington.

MODIFIED.

Bullock, Frederick .... Manchester.

A Member who had paid his subscription for the current year, and the nominal fine of one shilling, was restored to membership.

Resolved—That the following Registered Chemists and Druggists be elected Members of the Society:—

Claridge, John Frederick ...... Warwick.
Hargreaves, William Henry .... Over Darwen.
Harris, Walter William .... Highgate.
Lenfestey, William Giffard ...... Faversham.
Queenborough, John, jun. ...... Boston.
Willson, James George .... Chatham.

PHARMACEUTICAL MEETING.

Wednesday Evening, October 4th.

The Inaugural Meeting of the Session 1871-2 was held on Wednesday evening, October 4. There was a large number of ladies and gentlemen present to witness the distribution of prizes to the successful students of the past session, and to hear Mr. John Mackay's address to those about to commence or resume their labours.

The chair was occupied by A. F. HASELDEN, Esq., F.L.S., President of the Society.

The following donations to the Museum were announced, and the thanks of the meeting were given to the respective donors:—

Specimens of Condurango: presented by Drs. Farre and Redwood,—Chloral Hydrate: by Mr. Barrett,—Chloral Hydrate, Fuming and Purified: by Dr. Versmann,—Poison Bottles; Bottle Guards: by Messrs. Frazer and Green,—Aloin: presented by Messrs. T. and H. Smith,—Oxalate of a New Cinchona Alkaloid: presented by Mr. D. Howard,—Specimens of Unclayed Manilla Sugar and Pure Crystals of Cane Sugar prepared from the same: presented by Mr. W. W. Stoddart,—Specimens of Sulphate of Strontia (Celestine) and Crystallized Peroxide of Iron (Hæmatite); presented by Mr. W. W. Stoddart,—Iodides of Ammonium and Potassium: presented by Messrs. Southall, Son and Dymond,—Bark and Leaves of *Alstonia constricta*, F. Mueller: presented by Dr. J. Bancroft, Brisbane Hospital,—Bundle of Connoch Chumpa Flowers from Calcutta: presented by Mr. H. W. Pound,—Seeds of Cinchona: presented by Mr. D. Hanbury, F.R.S.,—A Collection of 306 specimens of Chinese Materia as described in Dr. Porter Smith's work: presented by Mr. D. Hanbury, —Specimens of the following Indian Drugs:—Seeds of *Carthamus tinctorius;* Bombay Liquorice Root; seeds of *Plantago Ispaghula;* seeds of *Nelumbium speciosum*; White Mustard Seeds; Mysore Poppy Capsules; Resin of *Vateria Indica;* Resin of *Shorea robusta;* Candeish Opium; Arrowroot of *Curcuma angustifolia;* Stems of *Nardostachys Jatamansi;* Roots of *Hedychium spicatum;* Hooghly Safflower; Black Dammar from Coorg; Bark of *Samadera Indica;* Fruits of *Datura alba:* presented by Dr. Forbes Watson,—Dried Specimen of *Andromeda Leschenaultii;* Methyl-salicylic Oil obtained from the leaves of *Andromeda Leschenaultii;* Salicylic Acid, an intermediate product obtained in the preparation of Carbolic Acid from the same plant: Phenol, or Carbolic Acid, prepared also from the above plant—prepared by J. Broughton, Esq.: presented by Dr. Forbes Watson,—A New Powder Folder: presented by Messrs. Maw, Son and Thompson,—A New Poison Bottle Guard: presented by Messrs. Maw, Son and Thompson.

The PRESIDENT said,—The programme before us this evening is one entirely of a pleasurable character; I am truly thankful that there will be no political feature about it. In the first place our professors will give their usual, and, as I anticipate, satisfactory report of the pupils during the past session; the prizes will then be distributed and a few words of congratulation addressed to the candidates, after which our good friend and colleague, Mr. Mackay, will deliver the inaugural address. Permit me in the meantime to offer a hearty welcome to you who by your presence to-night upon the commencement of this session, show that you take an interest, not only in the distribution of our prizes, but, as I believe, in all that pertains to the prosperity of our Society. Since we made bold, and we were rather shy at first, to ask the ladies to attend upon these occasions, my predecessors have said a separate word of welcome in their favour, and I see no reason why I should deviate from so excellent a custom. They render every cheerful scene more cheerful and every pleasure greater, their presence acting as it were like a sunbeam. With the poet's words I sincerely welcome them,—

> "All honour to woman, to her it is given
> To wreathe the dull earth with the roses of heaven."

The PRESIDENT then called upon Professor Redwood to present his report with regard to the class of chemistry and pharmacy.

Professor REDWOOD said the task, or perhaps he should rather say the duty, that the professors had to perform at the opening meeting of every session of their school, was always a pleasant one, and especially so when they had a good list of prizes to be distributed to a number of good men who had acquitted themselves with credit in a previous session. Far more agreeable was the duty which they had to perform at the opening than that which devolved upon them at the closing of a session, when they had to finish the work of a long ten months' application to study by inviting the students to a contest—a friendly contest it might be, but one nevertheless in which there were many anxious thoughts, and some misgivings with reference to the result. The hopes and sometimes the confident expectations of some of those who entered the lists were necessarily doomed to disappointment, and many a hard-working, well-conducted, and meritorious student found himself unfortunately in the position of an unsuccessful candidate, and had to return to his friends without the coveted distinction of being a prize-man. They could not award prizes to all, and must necessarily cause disappointment to many, some of whom might go away, as no doubt they often did at the conclusion of a session, discontented with themselves and dissatisfied with the result of their sessional labours in the school. That was the scene at the closing of a session. Now at the opening of a session it was otherwise. He need not tell them what it was, for it was before them; they had forgotten the bad and all disagreeables, and thought only of the good. They had a good number of prizes which had been awarded to a considerable number of able men who had amply justified their claims for these distinctions, and they had invited the members, and the ladies especially, to confer a smile of approbation upon those who would come forward that evening to receive these distinctions. In his class there were at the close of last session eleven candidates for prizes, to six of whom some marks of distinction had been awarded, and they were as follows:—

Silver Council Medal	Henry Churchill.
Bronze Council Medal	Charles Arthur Overton.
Certificates of Honour	Horace Davenport. Thomas Iredale.
Certificates of Merit	Frederick J. Hanbury. Walter Benjamin Cole.

In conclusion, he (the Professor) could state most truly that the whole of these gentlemen had richly merited the distinctions which had thus been conferred upon them.

The questions for examinations were as follows:—

CHEMISTRY AND PHARMACY.

Hours: Ten till One. Standard Number of Marks, 100.

1. What is the weight of a fluid ounce of rectified spirit?
2. What is the specific gravity of a liquid, a fluid ounce of which weighs 321·5625 grains?
3. How do you explain the difference between common light and polarized light?
4. When a ray of polarized light passes through a tube filled with oil of turpentine, what effect is produced on the ray, and how do you explain it in accordance with the undulatory theory of light?
5. Describe and explain the phenomena of fluorescence, and give a few instances illustrating their occurrence in liquids and solids.
6. Explain the terms specific heat and latent heat; describe the methods of determining the latent heats of water and of steam, and state what they respectively are.
7. Describe the process of percolation or displacement as applied to the preparation of tinctures, and point out conditions on which the successful application of the process depends.
8. Describe carbonic oxide and nitrous oxide, their composition, production, and properties.
9. What are the specific gravities of *Liquor Ammoniæ* and *Liquor Ammoniæ Fortior* of the Pharmacopœia, and what proportions of ammonia do they respectively contain?
10. How is hydriodic acid produced, in the form of gas, and also of liquid?
11. How is iron obtained in what is called the passive state, and what are the phenomena which characterize it in that state?
12. Describe the processes of the Pharmacopœia for the production of *Chloroform* and *Hydrochlorate of Morphia*, making any remarks that may occur to you in reference to them.
13. Give the formulæ representing the composition of the following bodies:—

    Carbolic acid.
    Gallic acid.
    Ammoniated mercury.
    Tartarated antimony.
    Borax.
    Alum.

The PRESIDENT then distributed the prizes to the successful candidates, and called upon Professor Bentley to state the result of the examination in the class of Botany and Materia Medica.

Professor BENTLEY said that he had always, at the commencement of a session, a difficult, but, at the same time, agreeable duty to discharge. Thus it was extremely difficult to find words to vary the uniform tenour of the observations which he had made on the conduct of the students of his class for the long period of twenty-three years during which he had been connected with the Society. But it was that which also made it an agreeable duty; for during the whole of that period he had had uniformly to speak of the regularity of attendance, good conduct, diligence, perseverance, and progress of, he might say, the large class which was entrusted to his care. That which he had always said he could repeat on the present occasion. In no previous session had he experienced more pleasure than he had done during the past year, both in that hall and in the garden of the Royal Botanic Society, in consequence of the general good conduct of the students. With these few brief words, which he hoped would be gratifying to those who had been unsuccessful, because, as his colleague (Dr. Redwood) had said, all could not be successful, he would now make a few remarks as to the prize examination. He was most gratified to say that, so far as his experience was concerned, the competition was altogether unprecedented. No less than thirteen candidates presented themselves to compete for honorary distinctions; and in order to show the great merit of those who competed, no less than nine gentlemen had, through his recommendation, been selected for honours by the Council. To give some idea of what those honours were, and to show that these gentlemen well deserved them, he would just state briefly what the rules of this Society were in relation to the award of these distinctions. No one was entitled to the silver medal unless he obtained over four-fifths of the marks,—that was, at least 80 marks out of 100; no one was recommended for the bronze medal or an honorary certificate unless he obtained three-fourths of the marks; and the certificate of merit was not awarded unless three-fifths of the marks had been gained. Those, therefore, who were not previously familiar with the examination in this Society would be able to form a true estimate of the distinctions which those students had obtained whose names he would read to them, and who would come forward to receive the prizes from the President. To all and every one he could say that they most thoroughly deserved the several distinctions to which they had become entitled. The first prize was the Silver Council Medal, which had been given to one who had already appeared before them to receive the Silver Medal in Chemistry and Pharmacy—Henry Churchill. The Bronze Medal was obtained by one who had well sustained the credit of that school, running very near to the Silver Medal list, and who bore a well-known name—Horace Davenport. Those who had obtained certificates of honour were Alexander Wood and Walter Benjamin Cole; and those who had obtained certificates of merit were Charles Arthur Overton, George Bult Francis, Thomas Iredale, Herbert Charles Webb, and Charles Alexander Blake.

The questions for examination were:—

Botany and Materia Medica.

BOTANY.

Hours: Ten till One.

1. Describe the general properties and structure of the cell-wall, and distinguish between parenchymatous and prosenchymatous cells.
2. Describe the structure of aerial leaves, and mention in what respect they differ from submersed leaves. Also state the distinctive characters between the leaves of Monocotyledonous and Dicotyledonous leaves.
3. Define the following:—Rhizome, tuber, parasite, epiphyte, conduplicate, reclinate, spadix, cyme, follicle, legume, pome, siliqua.
4. What is the seed? Describe its structure and mode of germination, and state the differences between the germination of the seeds of Monocotyledonous and Acotyledonous plants.
5. Give the essential characters of the following Natural Orders, and enumerate the officinal plants which they respectively contain:—*Cruciferæ*, *Umbelliferæ*, *Atropaceæ*, *Gentianaceæ*, *Iridaceæ* and *Liliaceæ*.

MATERIA MEDICA.

Hours: Two till Five.

1. Describe the method by which opium is obtained. State the characters of good opium, and mention the preparations in the British Pharmacopœia into which it enters as an ingredient.
2. How is aloes obtained in the greatest purity? Describe the distinctive characteristics of socotrine, hepatic and Barbadoes aloes.
3. What are the botanical and geographical sources of myrrh? Describe the physical and chemical characteristics of good myrrh, and enumerate the preparations in the British Pharmacopœia into which it enters as an ingredient.
4. What are the characters of the ordinary East Indian, Tinnivelly and Alexandrian kinds of senna? Mention their botanical and geographical sources, the substances usually employed to adulterate them, and the means of detecting such adulterations.
5. What are the botanical and geographical sources of the officinal and Savanilla kinds of rhatany? Show how they may be distinguished from each other; and mention the active constituents, medicinal properties and officinal preparations of rhatany.

The various prizes and certificates having been awarded to these gentlemen by the President, who accompanied them in most cases with suitable words of congratulation and encouragement, Professor Attfield made the following report on the class of Practical Chemistry:—

Professor Attfield said that he had nothing but good to report of the class of practical chemistry. To say this much was really to speak in high terms of praise of the students. For whereas his colleagues and teachers of lecture-classes generally could certify to the bodily presence and the outward behaviour of their pupils, and to the amount of knowledge possessed by a certain proportion at the end of a session, he and teachers of laboratory classes generally could testify, not only in these respects, but from daily and hourly observation, to the degree of ability and zeal displayed by every student. During the past year they have lived and laboured in the laboratory on the most perfect terms of harmony with each other. He himself, as well as his assistants, Dr. Tilden and Mr. Moss, had at all times found the students most ready to receive direct and indirect instruction, and willing, nay, anxious, to submit to periodical examination; instruction had thus been stimulated by examination, and examination by instruction, and the product had been, they trusted, a commensurate amount of education. And amongst the members of the class themselves, that free interchange of thought, mutual help, and frequent conversational testing of each other's progress, which is only possible to students working together under the same roof for a considerable period, had largely contributed to the general proficiency of each and all. The result had been that of the laboratory-students who during the year presented themselves before the Board of Examiners as candidates for the minor title of *Chemist and Druggist*, or the major title of *Pharmaceutical Chemist*, fewer than ever were plucked. Indeed, as a rule, he did not admit the possibility of a laboratory-student being rejected. There were, of course, exceptions to this rule. Unavoidable circumstances occasionally obliged a man prematurely to go up for examination; that man was surprised if he succeeded. Every year or two a student was met with in whom idleness and vice had drowned every trace of self-respect; when such failed to be sent back it would be time for the Council to pluck the Examiners. With these exceptions failure in the "Minor" or "Major" was most unusual on the part of a laboratory student. During the past session the entries in the practical class had reached 113; a higher number than that of any previous session. Moreover, for the first time, the laboratory class had been larger than either of the lecture classes. When the school was instituted, there was no laboratory class, the only method of instruction being that of lectures; afterwards means of prosecuting the study of chemistry by practical manipulation were provided, and ten gentlemen entered. In four years the numbers had risen to thirty, afterwards approaching, and last year exceeding the numbers attending lectures. Such a result, he thought, must be gratifying to those pioneers in pharmaceutical education who had striven to place this, the most thorough and effective method of learning chemistry at the disposal of students. Still there was abundance of room in the laboratory. Two years ago twelve new benches were added; and since the passing of the Pharmacy Bill of 1868 many students had worked for very short periods; hence if each one of the seventy-two benches were occupied as soon as empty, more than 200 gentlemen could be accommodated annually. When they might expect to reach this number he did not know, but his experience showed that practical chemistry was more studied every year, not only for its own sake, but as the quickest and best means of acquiring that knowledge of the principles of chemistry without which success in business became increasingly difficult, and success in passing the Minor and Major Examinations impossible. He had further to report respecting last session, not only that the conduct of the students was highly commendable, and that practical chemistry, as a branch of study, continued to increase in favour, but that the laboratory cost the Society nothing, it having about paid its expenses. At the close of the session nine gentlemen had competed for the prizes, conducting experiments with this object during two whole days. The tasks included operations in qualitative and quantitative analysis, and the value of perfect work was represented by the number 100. The extent to which the competitors severally approached this standard was indicated in the following table:—

Mr. Arthur P. Smith . . .	95
Mr. James Hughes	82
Mr. Henry Churchill . . .	79
Mr. Thomas Iredale . . .	73
Mr. Harold Woolley . . .	68
Mr. Herbert E. Constance .	66

The other three students obtained less than 60 marks—the minimum for honours. To Mr. Arthur P. Smith the Council had awarded an extra silver medal; extra, because Mr. Smith, being unconnected with the Pharmaceutical Society, or, indeed, with pharmacy, was, according to an old rule, scarcely eligible to compete for the medals. Mr. Smith was a most zealous and intelligent student; but through devotion to chemistry alone naturally was able to out-distance his fellow-students, who had to learn simultaneously three or four subjects. To prevent such non-pharmaceutical single-study men entering any class in the school, and running away with honours and prizes instituted for the encouragement of the harder-worked students in pharmacy, an order was made some years ago restricting the award of the medals, competition for the certificates remaining open. Under this rule Mr. Smith would only be able to take a certificate of honour of the first class; but considering, it was to be presumed, the unusually high merit of Mr. Smith's work, and that he would be likely to do credit to the School, the Council had kindly, and in the Professor's opinion wisely, given to Mr. Smith the much-coveted silver badge of excellence. Mr. James Hughes also having won a silver medal, was rewarded accordingly. Mr. Henry Churchill, the Junior Bell Scholar of last year, just missed the silver, but took a bronze medal. Messrs. Iredale, Woolley and Constance fully deserve their certificates of merit.

Practical Chemistry.

Hours: Ten to Five. Books and Memoranda permitted.
Standard Number of Marks, 100.

1. The substances supplied to you are five pharmacopœial chemicals. Name them.
2. Ascertain the nature of the impurities (if any) present in the accompanying salts.
3. The lozenges are supposed to be poisoned. Ascertain if such is the case.
4. A specimen of urine is placed before you; is it morbid or healthy?
5. The sample of "pyroligneous acid" contains some hydrochloric acid. Determine volumetrically the amount of each acid.
6. Analyse quantitatively the sample of Epsom salts. Give your results in percentages of Mg, SO_4, and H_2O.

P.S. You are at liberty to select one of the last two exercises, but not to attempt both. The same value in marks is attached to a correct answer in either.

The awards were then distributed to the respective successful competitors in this class.

Professor Bentley next stated the result of the competition for the Herbaria Prizes, remarking that he could not, although time pressed, refrain from doing justice to those who had competed for these distinctions. On the present occasion two collections had been forwarded for competition; and although he did not ask those present to examine them at that moment, yet he should like those interested in knowing what students could do to look at these collections before the close of the evening's proceedings. They all knew that these prizes were given for the best collections of British plants, and they were essentially competed for by young students of this Society, to whom they acted as a stimulus to the prosecution of a study which was not only important, practically, as bearing upon their future education and advancement as scientific pharmaceutists, but also as regarded their early training, in cultivating their powers of observation and discrimination. The two competitors on the present occasion were both deserving of distinction. He was particularly pleased to be able to state that the first was from a student who was only seventeen years of age, hence they would be able to appreciate the real merit which was due to him, and when he stated further that his name was Stoddart they would know that he bore an honoured name. The collection comprised between 500 and 600 plants, and when it was examined, he felt sure they would say that Mr. Walter Boycott Stoddart had honourably obtained the Bronze Medal. The second distinction which had been conferred was a certificate of honour to Augustus Horton Crundall, whose herbarium was also in the room, and he (Professor Bentley) could say that the student well deserved the distinction which he had obtained. The examples of these successful competitors would act as an inducement to other students to prosecute botanical studies during their apprenticeship, not only for the sake of botany itself, but also for the advantage it would give them as a training for their after studies.

The PRESIDENT then presented the Prize of Books for the best answers upon pharmacy and dispensing, remarking that they had been very deservedly awarded to Edward Rammell, who would no doubt make good use of the volumes.

The following were the questions for examination:—

PRIZE OF BOOKS.

DISPENSING AND PHARMACY.

Time allowed: Two Hours. Standard Number of Marks, 300.

State the best method of dispensing the following prescriptions, assign the reasons for the same, and write the labels in suitable language:—

℞ Ol. Ricini ℥j
Mucilag. Acaciæ q. s. (state quantity).
Syrup. Tolut. ʒvj
Liq. Potassæ ʒiss
Inf. Sennæ,
Aquæ Cinnam. ana part. æq. ad ℥vj.

Ft. mist., cujus capt. part. quart. primâ luce et repet. circiter meridiem, nisi alvus plenè dejecer.

℞ Acid. Carbolic. ʒss.
Pulv. Glycyrrh.
Pulv. Acaciæ ana q. s.

Ft. pil. xij, capt. j cum singulo cibo.

State the proportions of the ingredients in, and the method of preparing, the following decoctions,—cetrariæ, papaveris, taraxaci.

Describe and explain the P. B. process for making ext. ergotæ liquid.

Describe and explain the P. B. process for making syr. papaveris.

State the proportion of cantharides in each of the following preparations:—

Acetum Cantharidis.
Emplast. Calefaciens.
Emplast. Cantharidis.
Liquor Epispasticus.
Tinct. Cantharidis.
Ung. Cantharidis.

The PRESIDENT said that last but not least he had to present the Pereira Medal, the highest honour bestowed by the Society, which had been awarded to Henry Churchill.

The following were the questions for examination:—

PEREIRA MEDAL.

CHEMISTRY.

Time allowed: Two Hours. Standard Number of Marks, 100.

1. A solution acidified with hydrochloric acid gives a precipitate with sulphuretted hydrogen: what metals would you expect to find in the precipitate, and how would you *separate* each?
2. Describe the best methods of preparing the chief compounds of phosphorus with oxygen. State the physical and chemical properties of each.
3. Explain fully homology and isomerism.

Section I. BOTANY.

Standard Number of Marks, 100.

1. Give an account of the different kinds of placentation, illustrating each by an example.
2. Describe the flower of clover.
3. How does a *double chamomile* differ in structure from a *single chamomile*, and a *double rose* from a *single rose?*
4. What is the structure of the fruit in a fig and in a mulberry?

Section II. MATERIA MEDICA.

Standard Numbers of Marks, 100.

1. What is the structure of the minute glands which constitute *kamala ?*
2. What is the body that occasions the granular aspect of some kinds of tar,—what are its properties,—and should tar of such aspect be preferred for medicinal use?
3. Mention a recently-noticed adulteration of saffron, and explain how it may be readily detected.
4. Name the products of the Order *Lauraceæ*, used in food or medicine, state the plant by which (so far as is known) each is afforded, also the country of which native.

The PRESIDENT mentioned that the Council had been able to award three Bell scholarships this year. Unfortunately last year there was only one gentleman who gained a sufficient number of marks to be admitted a Bell scholar; but this year the competition was so good that the Council determined to give three Bell scholarships, as there was no senior.

The following were the questions for this Examination:—

JUNIOR BELL SCHOLARSHIP.

ARITHMETIC.

Time allowed: One Hour.

1. Write down in words at full length 25,642.
2. Write in figures the sum of ten thousand nine hundred and twenty-four.
3. Reduce $\frac{64}{128}$ to its lowest terms.
4. From $\frac{6}{7}$ take $\frac{4}{5}$.
5. If 10 men can do a piece of work in 8 days, how long will 4 men take to do the same?
6. Convert 4*d.*, 6*d.* and 8*d.* to the decimal of £1.
7. Multiply 154·321 by 100.
8. Divide 7·424 by ·32.
9. What is the cost of 186 yards of linen at 2*s.* 3*d.*?

LATIN.

Time allowed: One Hour.

1. Helvetii jam per angustias et fines Sequanorum suas copias transduxerant, et in Æduorum fines pervenerant eorumque agros populabantur. Ædui, quum se suaque ab iis defendere non possent, legatos ad Cæsarem mittunt rogatum auxilium: Ita se omni tempore de Populo Romano meritos esse, ut, pæne in conspectu exercitûs nostri, agri vastari, liberi eorum in servitutem abduci, oppida expugnari non debuerint. Eodem tempore Ambarri, necessarii et consanguinei Æduorum, Cæsarem certiorem faciunt, sese, depopulatis agris, non facilè ab oppidis vim hostium prohibere. Item Allobroges, qui trans Rhodanum vicos possessionesque habebant, fugâ se ad Cæsarem recipiunt, et demonstrant, sibi, præter agri solum, nihil esse reliqui. Quibus rebus adductus, Cæsar non expectandum sibi statuit, dum, omnibus fortunis sociorum consumtis, in Santonos Helvetii pervenirent.
2. State to what conjugation the verbs in this sentence belong.
3. Compare *pulcher*, *acer*, *multus* and *malus*.
4. Put into Latin, "To him death was but the gate of life."
5. What cases does *in* govern? and give examples.

ENGLISH COMPOSITION.

Time allowed: One Hour.

Write a few remarks upon one of the following subjects:—

Travel.
Study.

CHEMISTRY.

Time allowed: One Hour. Standard Number of Marks, 50.

1. Why are hydrogen and chlorine called chemical elements? What are the combining proportions by weight and by volume of these elements in hydrochloric acid gas?

2. How would you ascertain whether a specimen of an acid consisted of nitric or sulphuric acid?

3. Give a process for converting mercury into the mercurous and mercuric chlorides.

BOTANY.

Time allowed: One Hour. Standard Number of Marks, 50.

1. Explain the characters which distinguish *Endogens* from *Exogens*, and give examples of each.

2. Describe the structure and functions of a leaf.

3. Explain the meaning of the terms *ovule, fruit* and *seed*.

4. What is a rhizome, a tuber and a bulb?

MATERIA MEDICA.

Time allowed: One Hour. Standard Number of Marks, 50.

1. What are the principal bitter tonics used in medicine? Give, in each case, the name and Order of the plant.

2. What drugs are imported from the West Indian islands?

3. From what plants and what countries are the following obtained,—rhubarb, cinnamon, senega, orris root, matico and kamala?

4. What is the drug called *Podophyllin?* and how made?

The PRESIDENT then said: Having distributed the prizes and certificates, I cannot deny myself the gratification of saying a few words of congratulation and encouragement to the successful candidates collectively. Upon many previous occasions, with the exception of last year, it had been the custom to address a few words to each candidate, but I consider the plan adopted by Mr. Sandford preferable. Time is saved, which is important, now that we have an annual address, and the necessity of repeating similar words of approbation is avoided. My words will be few, but they will be earnest, heart-felt expressions of approval and encouragement. Most sincerely do I congratulate, not only you who have obtained the highest honours, but also you who have deservedly received certificates. All who run in a race cannot win, but they who have striven to the best of their abilities also merit praise and encouragement. Continue as you have commenced; still go on perseveringly, and you will carry joy, not only to the hearts of those who take the greatest interest in your well-doing, but you will win smiles of approbation from those in whom you take an interest. And let me say further, that during my short tenure of the presidential chair I have had no pleasure in connection therewith in any way commensurate with that which I have felt in distributing the prizes tonight. Although not a pupil in the ordinary sense of the word, I am still a pupil, and expect to be one unto the end; therefore, I take particular interest in all that concerns the young, and feel gratified by their success. Once more I say, remember that for the young there should be no such word as fail. Go on and prosper, and my best wishes go with you.

The following Inaugural Address was then delivered by Mr. JOHN MACKAY:—

MR. PRESIDENT, LADIES AND GENTLEMEN,

Three years ago a new feature was introduced in connection with the opening of the winter session in this school, so long and so successfully carried on, by the delivery of a few words of encouragement and advice to the young men about to commence their studies in pharmacy, chemistry and botany. Let me remark how singularly happy the idea was to invite the company of ladies on such an occasion, and how much the pleasure of all is enhanced by the presence of those fair friends who so kindly honour us by being now present. The plan thus inaugurated, after fair and repeated trials, has been pronounced a success. Nor can this be wondered at, for what is more pleasing to the youth about to buckle on his armour, than to hear and to know that many, whose names must indeed be familiar as household words, meet together, and by their presence on such an occasion prove that they still possess the deepest interest in the educational advancement and mental improvement of those who desire to make pharmacy their daily work and profession?

In connection with this movement, three gentlemen have already had the pleasure of addressing the pupils on similar occasions to the present; and I know there are many now hearing me who can testify to the ability and care with which they have so admirably fulfilled the trust committed to them.

Now it is this very fact which places me so awkwardly. I do not intend to analyse or characterize the nature or conclusions of the addresses which have preceded this one; but I feel constrained under the circumstances, and specially referring to these productions of the past, to say for myself, how extremely difficult I find it to follow those who have on former occasions so ably taken their place at this desk. I feel conscious that it is not an easy thing to stand on the same platform with the educated and scientific gentleman, from whose lips I heard, three years ago, a paper from the very appropriate motto "Thorough." Or, again, I would with all seriousness ask, is it not enough to make the boldest man falter when requested to follow in the wake of the eloquent, sensible and practical remarks of our venerable and venerated fellow-worker, Henry Deane? while it might appear an equally vain thing to imitate the poetic style of such an address as some of us heard a year ago within the walls of this very house. And yet, with all this, the feeling steals over me that, many years ago, obedience was so strongly inculcated that, when called upon by the Council of your Society to make my appearance before you this evening, I felt that it was my duty to come and undertake the task, with the strong impression, that the honour conferred by the invitation was not a slight one, and that, while I might fail to express in such graceful language or impart to what I might say the brightness and happiness which, like a golden thread, did so much to clothe, connect and enliven the brilliancy of the papers of those who had already addressed you, I could, at all events, as plainly, faithfully and sincerely wish the young students now before me God speed in their pursuits, and a successful and prosperous termination to their studies.

I honestly pity the man, be his age what it may, who has become so insensate and indifferent that he cannot now and then in some respects be a youth again. When memory fails to carry back to that early period when the world, with all its joys, sorrows and cares was practically unknown,—when the youthful mind revelled in the anticipations of a future career,—when the whole horizon of dawning hopes and fears was lighted up with the day-dream of happiness and success,—I say, when a man shuts his memory to such reminiscences, I feel he is in one sense to be pitied. Standing where I now do, I feel irresistibly carried back a few years, and I would be untrue to myself as well as to you did I not say so.

I can conceive of no one, having lived for half a century, who has not during that period forged and encircled himself by a chain of association which he would be unfair to himself and to others were he deliberately to break in pieces and cast aside, as if its component parts were only worthless material. I admit that throughout life's journey, with all the mutation which is not only a close but an inseparable companion, such a chain could not long exist unbroken, without here and there giving evidence of a shattered link; and it is while I now address you that such a flood of remembrance comes strong upon me, reminding of a peculiarly bright link in such a chain of association, which, to speak for a moment paradoxically, is in one sense truly broken, but in another as certainly not destroyed. I feel that I cannot stand before such an assemblage, in the house and within the walls of the Pharmaceutical Society, without at the very outset of these few remarks, adverting to him through whose noble disinterestedness, untiring energy, and vast intellectual power our very Society, of which we are so justly proud, was founded, nourished and extended. Need I say, I refer to the late Jacob Bell?

I feel that it is almost unnecessary for me to ask you to bear with me while in a single sentence or two I recall the time when, side by side with him who but a few years ago passed from among us, I followed my daily walk and occupation,—that period of my life on which I often love to dwell and linger, and which, while the heart throbs, will ever continue to be a bright-green and ever-to-be-remembered spot in my memory. It may be a story often told, and yet I cannot resist saying, especially to my young friends now present, that Jacob Bell was no ordinary man. With a mental capacity few possessed, a grasp of intellect rarely found, love for his neighbour which nothing could quench, a firmness of purpose at once irresistible, devoted to the herculean and apparently hopeless task of raising our profession, an amiability as conspicuous as it was untiring, in manner and conversation suited to grace any society, —Jacob Bell stood forward as the champion of all connected with pharmacy, and has thus earned for his memory, the unfailing and never-ending gratitude of the pharmaceutical body. I offer no apology for thus referring to our departed friend, for, although the very facts I have named of his varied mental acquirements render it vain to expect that in the present generation we will ever see his equal; yet, as it is the testimony of those who knew him best, that many years were spent, and life itself at last sacrificed, in his longing desire to benefit those around him, I do sincerely hope that such a good example may not be entirely lost, and that, unlike the morning cloud or early dew, which so soon pass away, the results of his labours may long remain and ever be remembered. For myself, I can conscientiously express the hope, that I may never live to see the day when the honoured and loved name of Jacob Bell will be otherwise than gratefully and affectionately remembered in such a meeting as the present.

It has been affirmed that real knowledge is difficult to attain, and yet that, to many in the pursuit of it, the subject assumes three aspects or distinct phases. At the very outset the young and eager student thinks all so easy as almost to be within his grasp; or, at all events, at the very threshold of investigation, the atmosphere appears so clear and bright that the path he has to travel can scarcely be mistaken, and to his mental vision easy and soon to be traversed. Soon, however, comes the next stage, when, having fairly grappled the first difficulty, he finds he knows comparatively nothing; and with such a feeling, accompanied by a noble and determined effort to acquire the desired and necessary information to fit him for his future career, comes the third condition or phase, that of perfect conception and rapid acquisition of the real knowledge sought for.

Many who have prosecuted study and research will admit that, in many cases, there is considerable truth in this statement, while the description may be looked upon by others as fanciful and figurative; yet it cannot be denied that in no profession is such a state of gradual advancement so apparent as in our own. To many the first step in chemistry and pharmacy seems simple and easy, and yet how rapidly comes the time when the peculiarities and depths of the sciences require our closest attention and study, before we can comprehend either their marvels, harmonies, or truths! It is, indeed, correct when we say there is no royal road to knowledge, and we who are pharmacists form no exception to this unvarying rule. Let me then, in view of this fact, impress upon you all the value of time. During no period of life is it more difficult to realize this than in youth. I know that five minutes or half an hour spent in a light frivolous manner is thought nothing of by many a young student. I know well that fatigue will often plead, and that powerfully, for rest and amusement; but I go further, and say, relaxation is not only useful, but a necessity. What I ask for is not the abuse, but the use, of spare minutes and hours. As Martin Tupper has it,—

> "If the mind is wearied by study, or the body worn with sickness,
> It is well to lie fallow for a while, in the vacancy of sheer amusement;
> But when thou prosperest in health, and thine intellect can soar untired,
> To seek uninstructive pleasure is to slumber on the couch of indolence."

The real life of every pharmaceutist may be said to be divided into two stages or divisions. The first can be recognized as the period during which a young man ought to learn and acquire a solid foundation on which to depend for his future success; while the other may be said to embrace the more extended period during which he will be called upon to exercise or apply the information gained by study and application to the circumstances of his position, and thus turn to some useful account the study of past years. No young student ought, therefore, ever to forget—

> "This above all, to thine own self be true,
> And it must follow, as night the day,
> Thou canst not then be false to any man."

Above all, be true each one to himself in this respect, that he feels and acts as if he knew, that it is essentially necessary to keep up the stock of knowledge already gained by the maintenance, more or less, of habits of investigation and study; for at the present time it is impossible for any one to take his true position as an educated pharmacist, unless he diligently keeps himself abreast in all that pertains to pharmaceutical chemistry. I know that in making this statement I lay myself open to the remark, that in many cases the opportunities for self-improvement are so few, and the means of cultivating the scientific department of our business so meagre, that it is almost impossible to evoke from odd minutes or even hours such results as those at which I have hinted. But to meet such a feeling, may I not refer to cases where the most brilliant talent has, after being clouded and hid amidst difficulties and struggles, emerged and shone with dazzling lustre in the horizon of science. It has been surmised that Sir Humphry Davy would never have been the great philosopher he became had he been favoured with extensive privileges in his early career, and that the discipline through which he was compelled to pass, owing to his comparative poverty, developed the perseverance and energy so necessary in his future researches to raise him to a pinnacle of fame few in the world ever reached. But to go a step further, it is known that the late Professor Faraday, pupil and successor to the illustrious Davy, being of very humble parentage, was, at the early age of thirteen, apprenticed to a bookbinder, and while following this his intended occupation, was found one day reading an article on electricity in a volume of the 'Encyclopædia Britannica,' which had been sent to be bound. The gentleman to whom the book belonged, on making this discovery, was so much struck, that he presented Faraday with a ticket to attend Davy's lectures at the Royal Institution, soon after which he was admitted to a place in the philosopher's laboratory, and reached, as you all know, long before his death, a world-wide renown and reputation.

Of these two great men it has been said, "Both were greater because of their first difficulties; but they were greater because they had the mental constitution which required such difficulties to brace their power. Had they been originally men of ordinary mental gifts, they would have remained until death in their original obscurity. Had they, in common with their great mental endowments, possessed unlimited facilities, they might never have passed the bounds of a respectable mediocrity."

I cannot, therefore, impress too strongly upon all the great importance of a just appreciation of the value of time. Every man is apt to waste or misspend time; and we know, if once lost, it can never be regained. We can measure its flight, but we cannot, for a single moment, arrest its onward progress; onward, onward, since the world began; and on, unceasingly on, until the period when time itself shall be no more. The child of yesterday becomes the man of to-day; and if such be the unceasing and rapid flight of time, it certainly becomes all important to economize and use the precious and never-to-be-recalled minutes ere they flit for ever away. Well has Marsden put it when he says,—

"'What is time?'
I asked an aged man,—a man of cares,
Wrinkled and curved, and white with hoary hairs;
'Time is the warp of life,' he said; 'O tell
The young, the fair, the gay, to weave it well.'"

I know it is not an easy thing for the youthful mind to realize, in all its fulness, the value of time. There are so many allurements, so many whisperings, and so many attractions, that the mind is frequently insensibly led away, until, when the opportunity is over and the day far spent, regret and disquiet creep in, where all might have been peace and satisfaction. How often in mental review does the man of riper years wander back to time which has passed like a vision, and with such remembrances find what might have been otherwise a pleasing picture, so blurred and defaced, that pain, humiliation and vexation are all the more intensified from the few bright and beautiful spots which, like "apples of gold in a picture of silver," may be seen struggling through the gloom, carrying the conviction that many opportunities had been lost which might have been turned to useful account, but now gone for ever!

I make these statements very plainly and boldly, because I believe I am right in believing that there is no one now hearing me, for whom these remarks are specially intended, who has not a brief space of unoccupied time more or less on his hands; and I wish to draw the particular attention of all such to the full value of spare minutes, and to inculcate the amount of good to be done by a methodical and systematic arrangement of the short half-hour in the morning, evening, after meals, or, indeed, at any time of the day or night. I have a very pleasing recollection of what could be done in our own business at a period when hours of attendance were very much longer than at present. During my residence in 338, Oxford Street, not one minute was lost at breakfast, dinner, or tea. Each young man had his book on the table; while the evenings after 10, or even 11, o'clock were devoted to reading and study. More than myself are now alive to testify to the good results arising from such organization; and few things afford me greater pleasure than in recognizing, while I now address you, a living witness of the truth of what I have just stated, in the person of my old, tried, and valued friend, Mr. Hills, in himself a type of all that is good, generous, and amiable; and who, I am proud to say, was my fellow-companion during the whole time I was in Mr. Bell's establishment.

With a view to impress still further upon my young friends the inestimable value of time, I cannot resist introducing a picture which I feel assured will interest all, namely, a glance at the early years of the life of an eminent and excellent man; who, while in this world, so measured and arranged his time, that he greatly advanced the temporal and spiritual good of many of his fellow-creatures, and whose life and actions we may well strive not only to admire, but, in many respects, to imitate.

About ninety years ago there lived in Spitalfields a silk manufacturer. I must ask you, in imagination, to accompany me to his mansion, and wending our way upstairs into a boy's apartment, there find an inmate in the form of a youth about fourteen years old. This young boy is not idle; he has evidently head and hands employed. He is endeavouring to make some tubular instrument, the materials employed being card-board and glass. He is trying to make a telescope. Money to purchase one, or even better materials with which to attempt its construction, were not within his reach; but yet a telescope he must have. Accordingly, he may have paid one shilling for glass, and twopence for pasteboard, and with these he is busy at work. He proceeds without intermission; and when night has canopied the restless city and stilled its noonday roar into a murmur, and when its countless stars are keeping watch over the homes of men, you will see our young friend has succeeded; there, at his open window, he may be seen with his recently and economically made instrument pointed heavenward, his young eye, as sleepless as the objects to which his gaze is so earnestly directed, seems fixed to the other end, when, suddenly springing from the window, he exclaims, in perfect ecstasy, "I see them! I see them." He had thus early discovered the movements of Jupiter. A glance round the room showed abundance of chemical as well as astronomical proclivities; and, although it was his father's strong desire to bind him among the silken meshes of his own occupation, he became one of our most celebrated chemists, devoting his life not only to the varied pursuits of science, but also in a persistent endeavour to benefit the temporal and spiritual condition of his fellow-creatures. And who do you imagine this loving, able, and talented man was? No other than the first President of our Society, the gentle, amiable, kind and good man William Allen. Need I tell that the boy I have described became the founder of a philosophical society?—lecturer at one of the hospitals in the metropolis;—the intimate friend of Sir Astley Cooper;—the companion of the well-known Humphry Davy;—associated with Dr. Jenner in his great discovery;—and aiding and assisting not a little the celebrated Wilberforce in abolishing the slave trade.

All honour to this noble man's example, whose labours for the benefit and amelioration of his fellow-creatures were such as to carry his name and reputation far beyond the shores of his native country, and whose memory is yet honoured by many at home and abroad who have been privileged to know the time he spent, and the success which attended his unceasing and earnest efforts for the benefit of mankind.

So much for the unselfish life of a pharmaceutist, of, I am proud to say, one of ourselves, whose career, at once so brilliant and so remarkable, may well stand out as a beacon-light to warn from idleness and inattention, and, at the same time act as an inducement to make such use of time and talents, to the extent we are able, that a review of days and years passed away may give—mingled, it may be, with some regret—a feeling that our whole existence has not passed without more than one effort on our part to improve, both to ourselves and others, the opportunities afforded us. True, every one cannot be Jacob Bells or William Allens, for

> "All are not born
> To touch majestic eminence and shine."

But I beg you to remember that no man living, and particularly no one connected with us in our daily walk, can fail, if he is so disposed, to improve himself, and benefit, in some degree, those around him. Though no single individual can unaided rear a structure, still many a stone may be placed in position, and thus assist, in some measure, the building up of what may be looked upon with satisfaction. I am one of those who believe we all have our mission, and that our duty, in whatever sphere we may be placed, is to do our best; and thus acting, we are told "Angels can no more;" while such exertions will, and ought, to carry with them a feeling of happiness and comfort.

Throughout your student-life then avoid being selfish. Do not live entirely to yourselves, or simply for your own gratification or pleasure,—and allow me to add, that in emerging from the life of a student, let the man be as determined as the boy, not to live to himself, but view opportunities given for being of service to others, a great and high privilege which he can never over-estimate or value too highly. I do trust that in making these statements I am not misunderstood. I am a believer in what has been often quoted, "to know that before us lies in daily life is the prime wisdom," and I therefore do not in the least degree argue inattention to daily engagements and other claims, which every man in business must know and feel to be imperative; but as you mix in the world you will find human nature often difficult to understand or comprehend, and witness its inner promptings sometimes issue in anything but a pleasing aspect; and although it may be a comparatively rare thing for you to fall in with self-sacrificing individuals, yet trust me when I tell you, that as you journey on through life, and as year after year flits away, like milestones along the highway, reminding that though slowly you are surely treading the path which must at last end your journey, there can be no more pleasing or agreeable thought than the consciousness of having contributed, when opportunity offered, to the instruction, relief, or comfort of neighbour or friend.

I know much has been said and written, and that a strong feeling exists in the youthful mind in regard to a subject to which time will only permit me to glance, namely, early closing. I have always been, and still am, an advocate for this whenever it can be accomplished. It is undeniable that late hours in our business are in many instances the result of bad habits, and we know how difficult these are to eradicate. The aspect of many things has changed of late years, and in many towns and numerous districts, the general public have become educated to a change in this bad custom, and therefore many dispensing establishments now close at 8 o'clock instead of keeping open until a much later hour. Indeed, although there may be, and are, many exceptions, still I believe that with the chemist and druggist the iron age of late hours and slavish attention to business is rapidly passing, and that we are gradually approaching the golden age of pharmaceutical position. I would, however, say to all young men now present, that there may be particular districts, and very special reasons for some places of business keeping open till a late hour in the evening, and where, from a calm and dispassionate view of these circumstances, it is found to be a necessity, there should not be the expressions of disappointment, irritation and vexation which I know are now and then pretty forcibly expressed, but rather let there be an attempt made by constitutional means to bring about, if possible, a better state of things. I confess it is almost ludicrous to find that if from accidental circumstances, such as stock-taking, painting, etc., a druggist's shop chances to be kept open unusually late, you are certain to have parties coming in for certainly no very urgent medicine, but simply because the door was observed open, or the light visible. Sudden recollection coming then upon them, the most ordinary household medicine became an immediate necessity. Now this is not as it ought to be; and no one will be more satisfied than I will be, to know, that throughout the length and breadth of the land, dispensing chemists follow the good example of many of their brethren, and shut at such an hour in the evening, as will allow the young man to retire to his room for study, or to take some recreation, or what is better still, a portion of both.

A word or two as to your position here as students of this school. Many young men in the provinces have a feeling of disappointment and jealousy as to the great advantages which those who reside in London or neighbourhood find in Bloomsbury Square. I admit at once there is at first sight some foundation for such a feeling, for comparatively few can come from a distance to study in London. But I cannot help thinking that ere long this Society will cease to be an educating body. No one need start or look amazed under the impression that I am about to consign your able and eloquent professors and teachers to oblivion. My intention is very far from that, for I say all honour to those distinguished and tried men who have done so much for the existing race of pharmaceutists, and whose successful labours may yet, I hope, extend through many succeeding years. But be it remembered, we are now recognized by Government as an examining body, and it is certainly not unreasonable we should cease to be an educating one also. I fancy therefore that ere long the Society will neither appoint nor pay professors. Already it is understood that a young man may obtain the knowledge required to enable him to become associate or member in any way he pleases; and so, in like manner, I look forward to the time, not far distant, when in London or in the provinces, young men will attend lectures, as well as practical chemistry, without being taken under the wing of the Society; and thus that the existing course of study in the Square will be succeeded by lectures and lecturers more in accordance with an established college of pharmacy. I admit at once that a centre must exist somewhere, and for many reasons there is no place so well fitted for this as the metropolis. Never forget, however, that by study and application pharmacy and its kindred subjects are capable of being learned and comprehended in the country village as well as in the crowded town; and if not quite so easily and readily acquired, as when guided by eminent teachers, the merit of accomplishing the arduous task is all the greater, when in the absence of such opportunities a position can be gained in London or elsewhere.

It is neither the time nor the place to refer to the troubled waters of pharmaceutical legislation, nor will I make any remark as to the surging waves of fear and anxiety which have of late passed over the horizon of poison regulations and responsibilities; but I may remark, that in any approach we may make to Government, the keynote of our advanced position and recognition is so loudly sounded, that the eye of the general public turns more observantly than ever on our movements, and it therefore becomes us all to proceed with the greatest circumspection in all that pertains to the carrying out of existing Acts of Parliament; and while there are many good men and true standing in the breach, succeeding generations look to those who, like many now before me, will gradually but surely follow in the footsteps of those to whom they at present look up as their seniors. Again, then, let me urge upon you application and study. Never be discouraged with any difficulty. Ever remember there is much in these two short simple words, "Try again!" for I know no feeling more pleasing to a young man, than that of a sense of victory after more than one hard struggle to overcome what had appeared not only difficult, but almost insurmountable.

In conclusion, let me remind you that in connection with the varied course of study upon which you are about to enter, the science of chemistry very specially presents a wide and extensive field from which to cull many interesting facts. I feel that I have lived long enough to know that the comparatively finished chemist of to-day may become the humble and eager student of to-morrow, for amidst the more than giant strides with which chemical science has been, and is still advancing, it takes a great amount of labour, study and research to follow in the path of chemical investigation. What, may I ask, can be said of that science which, while it includes more or less the whole range of sublunary things, starts through the immensity of space, bringing you into acquaintance with the very materials of which the planetary system itself consists? Nay, invades the light of the sun, and tells that in the rays of the luminous orb of day there are found materials and compounds not only in great variety, but rivalling in value the diamond itself, thus giving unmistakable proof, that far away in the twinkling star, or soft silvery moon, and in the bright blazing sun, we have chemical elements in varied combinations, playing important parts, and giving rise to a wonderful and harmonious whole! Need I refer to spectrum analysis, electricity, dialysis, and kindred discoveries, as assisting to open the mysterious and hitherto unopened marvels and wonders of creation? While, however, surprise and amazement may be excited, let us never forget, that amidst the endless and never-wearying changes going on, the most minute, as well as the most stupendous work in the heavens above, or on the earth beneath, whether indeed it be the falling of the sparrow to the ground,—clothing the flower in all its gorgeous beauty,—raising the gigantic tree of the forest,—governing the stormy wind or wild ocean wave,—supplying the germ of vitality to the most tiny form of animal or vegetable life,—supporting the daily, if not the momentary wants of all existing things, is yet the ever kind, loving and beneficent Creator, who "has measured the waters in the hollow of his hand, meted out the heavens with the span, comprehended the dust of the earth in a measure, weighed the mountains in scales, and the hills in a balance, and who taketh up the isles as a very little thing."

The President was quite certain they would be very much dissatisfied if he closed that meeting without expressing their thanks and his own to Mr. Mackay for his very excellent address. Although at its commencement Mr. Mackay was willing to make them believe that he should fall somewhat short, he fairly proved in the end that

"Whether doing, suffering, or forbearing,
We may do much by persevering."

The Chairman announced that the next evening meeting would be held on Wednesday, November 1st.

Provincial Transactions.

TYNESIDE CHEMISTS' ASSISTANTS' ASSOCIATION.

The Inaugural Meeting of this Association was held on Thursday evening, the 21st of September, in the Museum of the Natural History Society.

The President (Mr. Shaw), in commencing his address, stated that on coming to Newcastle a few months ago, a perfect stranger to the locality, he had regretted that there was no place in the town to which he, in common with his brethren of the trade, could resort for the purpose of social intercourse and interchange of sentiment on matters connected with their calling; the hint, he continued, was taken up by a few who had similar views, and the hope entertained that such meetings periodically held would form not only pleasant social reunions, but also that opportunities would then be afforded for practical improvement, and that thus, whether in the capacity of assistant or apprentice, a bond of unity for mental improvement and encouragement might be cemented to their own great advantage, the satisfaction of their employers, and the good of the public at large. The President then proceeded to say that the special business of the Society's meetings would be the reading of papers on subjects connected directly or indirectly with pharmacy, and the promotion of free discussion thereon, and he believed that such interchange of opinion would tend materially to help the younger members in preparing for the necessary pharmaceutical examinations.

A room has been taken for the meetings of the Association, which will be open to members every evening except Saturday and Sunday; hither they may resort to spend a quiet hour in reading or study, and here the ordinary meetings of the Society will be fortnightly held. It is intended, as soon as funds will permit, to commence a library and museum. Already a valuable collection of specimens of materia medica has been kindly presented by Messrs. Southall, Son and Dymond, of Birmingham. We indulge the hope that this liberal contribution may lead our neighbours to lend a helping hand in an undertaking which cannot fail to commend itself to the good feeling of the community.

The Secretary (Mr. Alfred Brady), in a few cursory remarks, stated that it was proposed to place on their tables some of the periodical publications more immediately connected with chemical, pharmaceutical, and medical science, for the perusal of their members; and concluded by assuring the younger members of the Association that the earnest desire of the committee was to render them every aid that their position would admit.

A medical gentleman was present at this meeting, and dropped a few words of encouragement to those who had but newly entered on their career, urging them to meet courageously the little difficulties which must needs arise in their elementary training; and assuring them that, after having by close study surmounted these, their future course would be comparatively easy and pleasant.

A cordial vote of thanks was accorded to this gentleman for his advocacy, and to the President.

The meeting was brought to a close by the Secretary reading a paper on "Alchemy, the Cradle of Chemistry," which was listened to with great attention and interest.

The number of members already enrolled is upwards of fifty.

THE MIDLAND COUNTIES CHEMISTS' ASSOCIATION.

A circular has been issued by Mr. Joseph Lucas and Mr. Walter R. Jones, Honorary Secretaries of the Midland Counties Chemists' Association, calling the attention of the Chemists' Assistants and Apprentices of Birmingham and the Midland Counties to the following classes, at the Birmingham and Midland Institute, as being those which are likely to be most useful to candidates preparing for the examinations of the Pharmaceutical Society.

Arithmetic, Mondays and Wednesdays, 8 p.m.—Fee, one penny a lesson.

Botany (Vegetable Anatomy, and Physiology), Wednesdays, 8 p.m.—Fee, 3*s*. 6*d*. a term.

Elementary Chemistry, Tuesdays, 8 p.m.—Fee, one penny a lesson.

English Grammar and Composition, Thursdays, 8 p.m. —Fee, 3*s*. 6*d*. a term.

Latin, Mondays, 7.30 p.m.—Fee, 3*s*. 6*d*. a term.

Practical Chemistry, Fridays, 7 to 10 p.m.—Fee, 10*s*. a term; Saturdays, 3 to 6 p.m.—Fee, 10*s*. a term; Saturdays, 6.30 to 9.30 p.m.—Fee, 10*s*. a term.

There are 30 lessons in each class during the session, which is divided into two terms, of 15 lessons each.

The following arrangements have been made with the Council of the Institute, for special facilities being given during the present session, to chemists preparing for the above-named examinations.

In the elementary chemistry class, a special lesson will be given from 9 to 10 p.m., on the first Tuesday in each month, to those students who desire to prepare for the examinations of the Pharmaceutical Society, who will pledge themselves to attend 25 of the ordinary class lessons in elementary chemistry at 8 p.m., during the present session, and to sit at the examination in that subject, which will be held by the Science and Art Department in May next. These lessons will be especially framed to meet the requirements of the examiners for the Pharmaceutical Society. As no extra fee will be charged to those students who avail themselves of these lessons, it will be understood that all who attend them undertake to comply faithfully with the above conditions.

In the practical chemistry class, the course of instruction, to those who require it, will be specially arranged for the same purpose. As each student will work independently, he may begin a course of study at any date.

All necessary materials will be provided for the course of instruction given.

Each student will be provided with a working bench, fitted with drawers and cupboards, for the apparatus, etc. with which he is supplied, and for the safe keeping and restoration of which he is held responsible on leaving the class. He will be required to pay a deposit of 2*s*. 6*d*. in addition to his fee, which will be returned to him at the end of the session, less any sum which may be charged to him for breakage of apparatus, or for the cleaning of any apparatus which he may have neglected.

All students who are admitted to the practical chemistry class, at the fee above-named, will also be required to comply with the conditions as to number of lessons, and attendance at examination in elementary chemistry, referred to in the paragraph relating to the latter subject.

In the Latin class, a special lesson will be given at 8 p.m., on the first Thursday in each month, for the purpose of reading with the student the works of the Latin author required at these examinations.

In the other classes, the course of study already includes the subjects required for the examinations.

The fees to the above classes must be paid to Mr. J. Lucas, 4, Colmore Row, or to Mr. Edwin Smith, Secretary of the Institute, Ratcliffe Place, Paradise Street, any day from 10 a.m. to 5 p.m., except on Saturday.

The fees to the penny classes are paid at the doors of the Institute, or books containing tickets of admission to six lessons, price 6*d*. each, may be obtained at the Institute.

Arrangements will be made, in those classes where it is found necessary, for extra lessons during the session to those students who join at once, in order that they

The text-books used in the classes will be those adapted to the object in view, and will be selected after consultation with the teachers.

Mr. Woodward will also give a special lesson to the members of the Chemists' Association, at 7 p.m. on Tuesday, the 10th of October, in order to explain to them the course of instruction which will be followed in the class.

If these arrangements should prove to be successful in the object for which they are designed, it is probable that the Council of the Institute will give further facilities to candidates for these examinations before the beginning of the session of 1872. They will also make such changes in the arrangements now proposed, as may be found by experience to be for the benefit of the students who avail themselves of the system now introduced.

Parliamentary and Law Proceedings.

Poisoning by Nitric Acid.

On Friday, September 29, Mr. Langham held an inquest at Westminster Hospital on the body of William Collin, aged nine years, who resided with his parents at Peabody Square, Victoria Street. On Tuesday evening previous a young man, a friend of the family, was in the parlour, making experiments with a galvanic battery, and on the table were two ginger-beer bottles filled with nitric acid. While the young man was engaged in attending to the battery, the deceased, unperceived by any person, came into the room, and, taking up one of the bottles from the table, drank a large portion of the contents. He fell to the floor shrieking with agony, which was the first intimation of his being in the room. He was at once taken off to the hospital, where every possible attention was paid to him, but he died in a short time in a state of indescribable agony. A verdict was returned that deceased was accidentally poisoned by drinking nitric acid.

A Child Poisoned by Strychnia.

Dr. Lankester, the coroner for Central Middlesex, yesterday held an inquest at the 'Stag's Head,' Hawley Road, Kentish Town, on the body of Mary Kate Rowbotham, aged two and a half years, infant daughter of Mr. Samuel Rowbotham, an author.

Mr. Samuel Rowbotham said he was a writer on chemistry and scientific matters, and father of deceased. A short time ago he had a son at school in Kent who suffered from skin disease. He had the child home, and to cure him, intended to apply some strychnine, taking some out of his medicine chest, which he had kept by him over twenty years, and putting it on the mantelshelf. On Thursday last the 28th ult., while engaged on a work which he had to get finished in a given time, his wife asked him to give deceased a dose of henbane. He got up abstractedly, and, as he thought, did so, placing the bottle back on the mantelshelf, when his little son said, "Oh, papa, give me some, I like it." He poured out ten drops, when the boy said, "Oh, papa, I don't like this." He then looked at the bottle (an ordinary common bottle) and was horror-struck to find he had taken the wrong bottle.

Dr. C. F. Groom, said on proceeding to the house he found deceased suffering from lockjaw. He gave an emetic, but deceased expired in ten minutes. The cause of death was poisoning by strychnine.

The coroner, remarking on the lamentable nature of the case, said this was another to be added to the list of deaths from poisoning caused by keeping dangerous fluids in common bottles. He had over and over again warned the public of the dangers they run in so doing, and had recommended that all poisonous matters should be kept in conical bottles, because then the moment the bottle was touched it would be known as a bottle containing poison. He hoped that the public would see the force of this, and adopt this simple means of putting a stop to such accidents.

The bottle containing the strychnine mixed with vinegar was here handed to the jury to examine, when the foreman, instead of smelling the cork, placed the mouth of the bottle to his lips to taste the mixture, and to the astonishment of those present would have taken more than was good for him had it not been for the speedy caution of the coroner.

The jury returned a verdict of "Death by misadventure."—*Standard.*

A Caution to Druggists.

At the Birkenhead Police Court on Saturday, Sept. 30, before Mr. Preston, a man, named James Craig, a labourer, living at 262, Price Street, was brought up in custody, charged with attempting to commit suicide by taking poison.

Ann Tickle, a young girl, lodging in the same house as the prisoner and his wife, said that on Friday evening the former sent her to the shop of Mr. Reece, druggist, 239, Price Street, for sixpennyworth of laudanum. He told her if the druggist asked her what it was for she was to reply that it was for a horse. She obtained the drug, and gave it to the prisoner, whom she then saw mix it with a gill of ale, which he took upstairs to his own room; she did not observe him come down again, and soon afterwards she was told that he had poisoned himself.

The prisoner's wife said, that on Friday evening her husband made an excuse to obtain her absence. When she returned she found him in a state of stupefaction, but not unconscious, and able to deny that he had swallowed any poison; she, however, saw a cup beside him, which smelt as if it had contained laudanum.

Dr. Vacher, the house surgeon of the borough hospital, said that he received the prisoner on Friday evening, the man being then in a deep sleep, and under the influence of opium. He was now out of danger.

Mr. John Reece, the druggist, was called. He said that the girl Tickle came to him for sixpennyworth of laudanum, which she said was for a horse, and without any distrust he gave her an ounce, the same thing having occurred on the previous day.

Dr. Vacher here said that an ounce was more than enough to poison any man.

The magistrate asked Mr. Reece if he was not aware that he should not sell poison in that manner, and without due precautions as required by law.

Mr. Reece reiterated that he did not mistrust the girl, on account of the same thing having occurred on the previous day, and nothing wrong having come of it.

The magistrate said to the druggist, that he had rendered himself liable to a penalty of £5 for not complying with the regulations of the Act of Parliament; he ought not to have sold poison to a child like the girl Tickle. He (the magistrate) did not know whether any proceedings would be taken against him (Reece)—that would be seen hereafter. The witness had been very blamable in the matter; he ought not to have sold poison to any person unknown to himself, or who was unaccompanied by some person whom he did know.

In answer to the magistrate, the prisoner's wife said that the poison was not sent by the druggist in a bottle, but in a cup, which, however, was labelled "poison."

Mr. Preston cautioned Mr. Reece to be more careful for the future; the prisoner might have lost his life through his carelessness, in which event he (Reece) would have been in a very unpleasant position.

Mr. Preston remanded the prisoner, to ascertain how his recovery progresses.—*Liverpool Daily Post.*

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Tincture Presses.

Sir,—About this time last year, I published in the columns of your Journal (Pharm. Journ. 1870, p. 321) a table of results which had been obtained when hydraulic pressure was used, for the recovery of spirit from the marcs of the various tinctures of the British Pharmacopœia.

At that time some of your correspondents thought the matter worthy of further attention; and from several pharmacists, who had compared my results with those they had been in the habit of obtaining with the ordinary tincture press, I received inquiries. The question most frequently asked was, "What would be the cost of a small hydraulic press that could be used for the removal of the spirit from the marc of about one or two gallons of tincture?"

Upon making inquiry, I found that not only were the smallest presses that hydraulic engineers were accustomed to make, much too large for a small pharmaceutical laboratory, but that the cost was so excessive, as compared with that of the usual press, that the extra outlay would not have repaid the purchaser, even if he could have recovered an additional *ten* per cent. of alcohol, over and above the quantity that he had been in the habit of obtaining, with the ordinary screw press.

The editorial reference in your issue of September 16th to *hydraulic tincture presses* again brings the subject before us; and I, for one, am anxiously looking forward to the description of the press you have promised to place before the readers of the Journal.

In the meantime, I think we cannot be better occupied than by making ourselves thoroughly acquainted with *the power* and merits of our old friend the screw tincture press. This done, we shall be in a better position to judge of the qualities of the improved machine that you purpose describing.

I here allude to the power more especially, because I think that very exaggerated notions are formed of the capabilities of the ordinary laboratory tincture press. For instance, we were recently told by Mr. Staples (who, by the way, is a pattern to us in the manner in which he applies his engineering skill to pharmaceutical requirements), at the British Pharmaceutical Conference at Edinburgh (Pharm. Journ. Sept. 9, 214), that the pressure obtained in the tincture press, as ordinarily met with, was nearly *twenty tons*. Now, without making any remarks upon the merits of the press as designed by Mr. Staples, an illustration of which appeared in your Journal, and upon which one of your correspondents has since commented, I should like, with your permission, to bring forward facts in support of the statement I have made, and I will do so by the following illustrations. (Before, however, doing so, it will be only just to say that Mr. Staples remarks in his communication "it may be objected that these figures are somewhat theoretical)":—I have in use two presses; the one (*a*) is rather old-fashioned, but very strongly made, and of a capacity of one gallon; such an one, I imagine, would be found in many a country pharmacy; the other (*b*) is one of more recent date, of about the same size (Lynch and Co., Aldersgate Street, E.C., makers). The mechanical advantages in the use of either of these can easily be deduced from the following; *as the circumference of the circle described by the lever where the power acts is to the pitch of the screw, so is the force applied to the resistance:*—

(*a*) Lever 10 inches.
Pitch of screw $\frac{5}{16}$ inch (·312).
Force applied at extremity of lever 50 lb.

Then $\dfrac{10 \times 2 \times 3{\cdot}1416 \times 50}{{\cdot}312} = 10532$ lb.
or about $4\frac{3}{4}$ tons (theoretically).

(*b*) Lever 8·5 inches.
Pitch of screw $\frac{1}{4}$ inch (·25)
Force applied at extremity of lever 50 lb.

Then $\dfrac{8{\cdot}5 \times 2 \times 3{\cdot}1416 \times 5}{{\cdot}25} = 10681$ lb.
or about $4\frac{3}{4}$ tons. (theoretically).

In these calculations it will be seen that the amount of force applied to the end of the lever is only half that upon which Mr. Staples has based his calculations. The lever, too, in both presses is somewhat shorter, while the pitch of the screw is materially larger in both, in one case being nearly twice the size. Now as I have ascertained that these measures given, accurately represent the various dimensions of the tincture presses of trade, which can be verified by a visit to any druggists' sundriesman's store in this city, it remains for me to give a reason, why I prefer to take 50 pounds as the force applied at the extremity of the lever rather than 100 pounds.

Upon reference to a work by Professor Rankine, I found that the average force applied by a man at the end of a lever, in such a position as met with in the tincture press (he instances pulling an oar), was 26·5 lb., and while working a crank 20 lb. It cannot, therefore, be said that in nearly doubling this amount, as I have done, my calculation has been taken upon a minimum power, but rather in excess of the true maximum one.

A little reflection will show, that the power exerted by a man in the position required for the motion of the tincture press lever is very different to the raising of a weight from the ground, in which additional muscles are brought into play.

It must always be remembered that when the screw is loaded, the friction to be overcome is something considerable; and for this reason, I have termed the results obtained by the above calculations as *theoretical;* for in order to obtain an exact idea of the real pressure exerted, a deduction of at least 30 per cent. must be made from the calculated pressure.

I think, therefore, that if the power obtained in the ordinary 1 gallon screw tincture press be computed to be *two tons* (as a maximum), a more accurate idea will be given of its power than when *twenty tons* is named as the total force obtained.

Charles Umney.

Laboratory, 40, *Aldersgate Street, E.C.*

The Chippenham Case.

Sir,—I cannot think that your correspondent M. P. S. altogether deserves the indignation with which Dr. Fox has visited him.

He at all events is justified in considering a solution of eighty grains to the ounce of corrosive sublimate as at the least a very strong application to the head of a child, and his argument is scarcely unfair when he objects to it because it is both "both powerful and caustic."

Here, as it seems to me, he has touched on the real source of risk attending its use; corrosive sublimate is not only one of the most powerful in its effects on the system of the compounds of mercury, but it is also one of the most corrosive.

We know what a valuable protection our epidermis or scarf-skin is to us in preventing the contact of various poisonous substances with the underlying true skin, which is otherwise so readily capable of absorbing all kinds of noxious substances into our systems. And we may presume that when we increase the strength of a lotion of corrosive sublimate to a point at which it exercises a corrosive action on the epidermis, we not only augment the quantity of soluble poison that is brought into such close proximity to the true or absorbent skin, but we also run a risk of destroying the thin protection which is the only obstacle to its absorption.

When, moreover, we reflect that so strong an application as the one in question can scarcely ever fail to raise a blister, and consider the fair possibility of that blister getting broken, we must admit that a timid man might be excused for hesitating before he applied it.

If, then, there be any possibility, however remote, of the lotion being absorbed by the skin, it may be well to consider what is the quantity of corrosive sublimate that incurs this possibility at each ordinary application of the lotion. Eighty grains to the ounce gives ten grains to the drachm. Now, placing an average adult dose of corrosive sublimate at the sixteenth of a grain, the drachm of lotion will be found to contain one hundred and sixty adult doses. Suppose, however, that only one-fourth of that quantity (viz. fifteen drops) gets applied at a time, then we still get forty adult doses contained in a single application to the head of a child.

Now since in ringworm there are usually several patches, and some of them often attain a considerable size, I should be disposed to say that fifteen drops is a moderate rather than an excessive estimate of the quantity of lotion deposited on the skin at a single application; but if the lotion be used as Dr. Fox recommends, by both precept and example, "very freely and very frequently," then, of course, we should probably get a much larger quantity of lotion deposited on the skin, and in it, of course, a much larger quantity of corrosive sublimate.

If I may be permitted to say so, I think it is possible to have even too "keen an appreciation of the importance of the chemist not usurping the duties of the medical practitioner," and to be, if possible, too indignant at the bare idea of his "setting himself up as a judge of therapeutics as against properly qualified physicians."

It is a good thing for some of us who prescribe, that the chemist does happen now and then, in a private and friendly way, to "set himself up as a judge of therapeutics," even as against our prescriptions; and we may be glad that this leads to his sometimes making a courteous inquiry of us, as to whether some particular line in our prescription was intended? Still more may we be glad that this inquiry usually comes before the prescription is made up.

For my own part, if posology be a branch of therapeutics, and if to understand posology requires some general knowledge of the rest of the subject, I should feel a good deal less comfortable in the pursuit of my daily avocations if I thought that chemists would in no case venture to question my therapeutics.

In the case in question, we learn from the report of the inquest, published in your columns, that the prescription in question was personally shown by the prescriber to the chemist, who was directed to make it up from the printed formula given to him in a book. No blame whatever could therefore attach to the chemist in this case.

But if the prescription had reached the chemist in the ordinary way no one would think of complaining if he, on finding that the composition of the lotion was exceptionally strong, had first made inquiry as to whether it was "intended" before he proceeded to dispense it.

Many people, I feel sure, would in such case have held him to blame if he had failed to do so.

As Honorary Surgeon to the British Hospital for Diseases of the Skin I have had fair experience of ringworm, especially at the Finsbury Square Branch of the hospital, where contagious diseases of the skin are more rife than at the parent (Great Marlborough Street) branch. But the doubts I have expressed to you respecting the expediency of strong corrosive-sublimate lotions, have always prevented my employing them, and my experience of their effects is confined to the observation of cases in which they had already been employed by other persons. My experience thus derived is not, on the whole, a very encouraging one.

I was glad to read a letter of Dr. Fox, in the *Lancet*, written a fortnight after the accident, in which, after stating that he had used the lotion in question for the past thirteen years, he says, "It is true I do not use the remedy now, but that is solely because I like other things better." If his conversion comes late, let us nevertheless congratulate him on that conversion.

BALMANNO SQUIRE.

9, *Weymouth Street, Portland Place, W.*

THE MISTAKES OF PRESCRIBERS AND DISCRETION OF DISPENSERS.

Sir,—Dr. Tilbury Fox, in his letter of September 18th, indulges in some sarcastic remarks on the proper duties of a pharmaceutist. I should like to know whether Dr. Fox still continues the use of 10 grs. of sublimate to 1 drm. of sp. for ringworm, and if not, why not?

About a month since a gentleman suffering from syphilitic sore-throat brought me the following prescription to prepare:—

℞. Hyd. Perchloridi gr. ij
Acid. Hydrochlor. Dil. ♏v
Aquæ ℥j.
M. Ft. Garg. sæpe utend. M. ℥viij.

I cautioned him as to its use, and hastily said I would not use it without diluting it. He used it the full strength once, and only once, as it nearly choked him, and two hours elapsed before he breathed comfortably. Of course, according to Dr. Fox's theory, I had no business to make any remark, but, after my forty years' experience, as a chemist, I could not hold my tongue.

A week since the following prescription was brought to my shop:—

℞. Ammon. Carb. gr. xl (40)
Ferri Ammon. Cit. gr. xl (40)
Sp. Cajeputi ʒij
Sp. Menth. Pip. ℥iv (*sic*)
Infus. Calumbæ ad ℥viij.
M. Sumat cochl. ij ampla bis (*sic*).
Aug. 7, 1871.
Pil. Assafœtid.
,, Rhæi Co., ana ʒss.
Div. in pillul. [*sic*] xij. Sumat ij p. r. n. nocte.

My assistant had prepared the mixture as written. I noticed that the dose of sp. menth. pip. though excessive was not dangerous, but as it was prescribed by a physician in one of our large commercial cities, and had been dispensed by a pharmaceutist in the same city, of high standing, I thought it right to let the lady know that the dose was very large, and if she found it stronger than her former bottle of medicine had been I would alter it to what I considered a proper dose. After trying one dose she requested me to do this. I wrote to my brother pharmaceutist who had first dispensed it, from whom I received a very courteous reply, saying, "That the amount of sp. menth. pip. was so evidently an error that he only put ʒiv of the B.P. which was the quantity he supposed to be intended!" I think Dr. Tilbury Fox's sublimate lotion for ringworm and my young friend's gargle much more dangerous than the above sp. menth. pip. mixture, yet according to Dr. Fox we are to *dispense* but not *opine*.

London, October 3rd, 1871. THIRTY YEARS' M. P. S.

DRUGGISTS' PRICES.

Sir,—In reply to Mr. W. M. Betts, who has the good sense to put his name to his communication, I have no doubt that hundreds of chemists would be ready to dispense the given prescription at the price named.

Retail prices and dispensing prices will often clash, and if the pharmacist finds it *infra dig.* to make pennyworths, the shopkeeper must supply his place to the public.

In the prescription in question the two first ingredients are pennyworths, the next two being minim quantities are included in one pennyworth, and water is not charged.

I will illustrate this by another case; it is a fact, not imaginary. A customer brings a six-ounce bottle, and requests half an ounce of compound tincture of cardamoms and a quarter of an ounce of spirits of sal volatile aromatic, to be put into the bottle. For these he pays threepence, and requests the chemist to fill the bottle up with water.

A Latin prescription is then produced, consisting of the above ingredients, and the chemist is reminded that on a former occasion he had the conscience to charge sixpence for the same. JOSEPH LEAY.

Chilcompton, Bath, September 25th, 1871.

J. B.—A chemist is not liable under the Pharmacy Act 1868, for selling yellow prussiate of potash without the precautions prescribed for poisons. See No. 54, p. 31.

"*East Wind.*"—The comparison drawn by you is obvious, but it does not affect the point to which our remarks were directed.

E. H. S.—No.

J. H. Thomas.—See a case reported in Vol. I. of this series, p. 775.

J. Ashlin Thomas and *J. Barker.*—The letters have been received, but the coroner's mistake was pointed out in last week's Journal.

"*Analuo.*"—Wanklyn and Chapman's 'Water Analysis,' published by Messrs. Trübner and Co.

W. H. Beaumont.—We have received your letter, and are obliged for the information furnished.

Messrs. Arnold and Sons.—The sample bottle forwarded to the Editor has been handed to the Secretary for exhibition at the evening meeting. Any further notice should appear among the advertisements.

COMMUNICATIONS, LETTERS, etc., have been received from Messrs. W. B. Cordley, Hughes, Thomas, Agnew, Heddingham, J. F. Caunt, J. H. Wilson, F. R. B., L. S., S. P. G. L., J. H. D., J. C. K., "Senega," "Humulus," "Primus," "Ferrum."

In consequence of want of room, we are compelled to defer answers to several correspondents.

PROVINCIAL EDUCATION.

BY EDWARD SMITH, F.C.S.

It is with very great diffidence, and with some misgivings, that I venture to approach the subject of provincial education. The question is one of no little difficulty, involving a multiplicity of interests, and a great variety of circumstances; moreover, the subject is under the consideration of men who have far larger experience—practical experience—in the matter than I can lay claim to. Nevertheless, I feel emboldened to contribute my quota to the general fund of suggestions, inasmuch as up to the present time, no really practical and comprehensive scheme has, to my mind, been even foreshadowed.

It is desirable, and I think imperative, at the outset to clear the ground of many of the extraneous considerations which may be imported into the discussion by at once dividing our subject into its three natural sections,

1st. Whom ought we to educate?
2nd. Of what should our teaching consist?
3rd. By whom should this teaching be carried out?

1st. Whom ought we to educate?

The answer must be: apprentices who have passed their Preliminary examination. It cannot be considered either just or expedient that any portion of the education to be provided by pharmacists should consist of classical or mathematical subjects. We cannot undertake to relieve parents of their responsibility to provide a suitable education for their sons intended to practise pharmacy; therefore I conceive it to be a *sine quâ non* that we must have regard in our professional teaching solely to the requirements of those youths who have passed their Preliminary, relying upon this examination to test the fulfilment of the parental obligations; and thus it is very desirable in order to secure the most intelligent youths, that the stringency of the Preliminary should not be relaxed, but maintained fully up to a good standard of general education. Neither can we have regard to the education of assistants. He who has already passed the Preliminary, and served his apprenticeship, must be considered to have passed beyond the scope of subsidized education. He is, or should be, in a position to pass his Minor, and provide for his future teaching.

2nd. Of what should our teaching consist? If we take up the position just enunciated, it is clear that our teaching must consist of elementary chemistry, pharmacy and botany, so arranged as to illustrate, as much as possible, the usual everyday work of apprentices—practical groundwork, with just a sufficient tinge of theory to make the study interesting, and to excite the mind of an intelligent youth. The form and manner of doing this work must, to a great extent, be left to local associations. As a rule, they will best appreciate the conditions most favourable to any particular town.

3rd. By whom should this teaching be carried out? Primarily by local associations. The Pharmaceutical Society, by reason of its fixed London habitat, cannot possibly do very much directly, in the way of teaching apprentices, but indirectly it may be of immense service in encouraging and promoting, in many ways, the efforts of local associations; and, to some extent, the Council of the Society has, by grants of money, encouraged the provinces, but this has generally been done in a very spasmodic and indefinite way, with very little regard to the quality or quantity of work achieved by local associations. Indiscriminate grants are worse than no grants at all. The provinces have a right to expect help from the parent Society, and the Council of the Society may fairly require provincials to prove they are doing some good work before making a grant; in fact, the duty of the parent Society is obviously to "help those who help themselves;" to subsidize provincial associations strictly in ratio to the amount of work done, and thus to promote a healthy and honourable rivalry amongst them.

Having thus briefly gone over the main ground, and cleared our path, I will now proceed to tabulate the plan which seems to me best calculated to achieve the object we have in view. In the first place, I would propose that a number of centres, say twelve to twenty, of examination be instituted in different parts of the kingdom, at which annual examinations —conducted by an examiner deputed by, and at the expense of the Council of the Pharmaceutical Society—should be held.

2nd. That local associations be formally affiliated to the parent Society, on payment of a nominal annual fee.

3rd. That no candidate be eligible for examination unless he has passed his Preliminary, and subscribed for at least two consecutive years to an affiliated association. Assistants having served their apprenticeship not eligible.

4th. That the parent Society grant 40*s*. (say) to any local association for each one of its candidates considered by the examiner to be worthy of a prize, and 10*s*. (say) for every candidate honourably mentioned: the prizes to consist of suitable books, and to be given at the cost of the local association.

5th. An eligible candidate may compete at any centre of examination, but at not more than one in the same year.

The plan thus crudely sketched may require some further explanation. The centres of examination may be—London, Salisbury, Exeter and Plymouth alternately; Bristol, Birmingham, Manchester and Liverpool alternately; Lancaster, Carlisle, Glasgow, Edinburgh, Newcastle, York and Leeds alternately; Lincoln, Cambridge and Norwich.

The number of centres may be increased, decreased, or varied at pleasure. By holding examinations at these centres annually, the associations in the smaller as well as in the larger towns would be brought into more immediate contact with the parent Society, and every apprentice—even those in small towns without any local associations, and therefore now practically isolated—would have his interest sufficiently aroused by the chance of a prize, as to induce him to join some association, more particularly if the latter could arrange for the ready circulation of volumes from their library, and offer some little advantage to country apprentices residing beyond the limits of ready access to the local classes (say) in a moderate reduction in the regular subscription.

It must be understood that the character of the proposed local examinations would be elementary and practical, such as an intelligent apprentice might fairly hope to master, and otherwise not to interfere with the usual Minor and Major examinations at

Bloomsbury Square, but rather form a sort of stepping-stone to these examinations.

Of course, local associations would admit to their classes apprentices who had not passed their Preliminary, as well as assistants, or any others, but these could not go in for examination so as to count for any grant from the parent Society.

The moral effect of these provincial examinations by a London professor, sent directly by the Pharmaceutical Society would be immense, but need not be dilated upon here.

The object in having provincial associations affiliated to the parent Society is to bind, as completely as may be, the whole of the country into one common bond of union, to make the Pharmaceutical Society what it really ought to be, the point around which all provincial associations should rally. There cannot and must not be any diversity of interests between London and provincial associations.

With regard to the requirement that candidates should have subscribed two years before being eligible for examination, this is intended as a source of support to local efforts; for, without this, a youth might subscribe just for one session and carry off the prize. It would not be well that this should be possible. By this rule a youth would, by way of subscription, help to keep up the funds of his association. Local monetary effort must always, to a great extent, be depended upon, and should, therefore, be encouraged in every legitimate way.

It may be asked, whence can come the funds to subsidize local associations? Can the Pharmaceutical Society undertake the task? I think it can. The Society is growing in wealth and power, and ought to expend some of its surplus moneys in the cause of elementary education. If we examine the balance sheet of the Society as put before the last May meeting, we find that the two professors of chemistry and pharmacy and botany and materia medica together received £600 for their lectures, whilst the fees from pupils amounted to just over £200, thus, apparently, involving a loss of nearly £400 per annum to the Society. I have nothing but unqualified praise to bestow upon these learned gentlemen in regard to their efforts; but how can they "make bricks without straw"? As I have previously said, Bloomsbury Square is not, and cannot be ubiquitous. If then these gentlemen were to curtail their lectures at Bloomsbury, and for one month in the year go on a round of examination, their efforts, I firmly believe, would be rewarded with triumphant success; and if they were to deliver a lecture or two at each centre on some interesting pharmaceutical subject, the result would be of incalculable benefit, and most inspiriting to local organizations.

I might expand this paper almost indefinitely, the subject is well worth it; but at present my object is solely to state the case sufficiently to make it intelligible.

I am not sanguine enough to think that so important and intricate a subject will be settled offhand and without much controversial discussion; still I hope and believe there is here shadowed forth a plan, which, although at present but crudely developed, has in it the elements of a sound, practical and comprehensive system of provincial education; and with this confession of my faith, I leave it in the hands of your readers.

CERTAIN PROPERTIES OF THE TUTU PLANT (CORIARIA RUSCIFOLIA).*

BY H. G. HUGHES, M.P.S., HOKITIKA.

(*Concluded from page 282.*)

Respecting the efficacy of a mixture of lime and water in cases of poisoning, before giving the report by Dr. G. H. Acheson, of this town, it may be as well to state that the antidote only was given; nothing was administered by way of general treatment besides what results when a mixture of cream of lime with water is added to the simple extract of tutu rendered fluid with a little water. The extract was prepared by macerating the young, but woody and developed, shoots in water, acidulated with acetic acid, and applying a gentle heat, pressing and evaporating to the consistency of an extract. These shoots yield extract more poisonous than the succulent ones. The handling of these wet shoots rather frequently induced vomiting. The day the extract was prepared, its mixture with lime gave strong ammoniacal vapour. It was very poisonous. About half a scruple was given to a cat; I was obliged to leave her, and on my return, in twenty minutes' time, found her dead.

On the second day the reactions were similar.

On the third day after preparation, the ammoniacal vapour was just perceptible, but readily detected by fumes of hydrochloric acid; it was but slightly poisonous.

On the fourth day the extract had become much thinner, gave no ammoniacal vapour, and was not in the least poisonous.

The extract preserved its original consistency until the third day, when it became soft, which condition was much increased by the fourth day. During this time the weather was fine; I do not think the atmosphere was more humid than usual. Three extracts prepared at intervals of five or six days, and in succession, behaved in a similar manner.

When the cream of lime is added to good (poisonous) extract, it coagulates or thickens, and appears to swell immediately, strong ammoniacal vapour being at the same time evolved. Should the extract possess fragrancy, owing to some of the fragrant oil not being dispelled during the process of preparation, it is at once destroyed by the lime. It is important to observe that the inert extract on the fourth day after preparation retained this odour. From what I have seen of its action, it possesses emetic properties only.

Recapitulation.—Acetic acid fixes or preserves the poisonous property (for a time at least), arresting its decomposition. When lime is added to good extract (poisonous), strong ammoniacal vapour is evolved; but on the fourth day, in the lime mixed with it, although possessing the odour of the essential oil, not the slightest trace of ammonia can be detected; the oil also, when destroyed by the lime, not giving any ammoniacal vapour, indicates it to be of a different composition, and a non-nitrogenous oil. The decomposition of the poisonous principle, resulting in the evolution of ammonia, shows nitrogen to be present in it. The fragrant oil comes over at 212° F., the poisonous principle at between 350° and 400° F. The spontaneous decomposition of the extract was carefully watched; there was no

* Read before the Wellington Philosophical Society, and reprinted from the 'Transactions of the New Zealand Institute,' vol. iii.

other perceptible change than its assuming a more fluid condition.

From what has been stated, it is observable that the poisonous principle is very unstable when in a state of extract, decomposes immediately when neutralized with lime, and is fixed (for a time at least) by acetic acid.

When the treatment of the plants was prolonged, the results were variable and of an indifferent character, which I attributed to the principles decomposing spontaneously when in the presence of water. Also, as the season advanced the results were less satisfactory, as if indicating a smaller amount of the various principles,—that is, with reference to the shoots, bark, and leaves.

The young ground shoots (plants growing from the ground) gathered in March, 1869, yielded most of the supposed alkaloid and the other principles. They were, besides, more woody than those subsequently examined. The last examined were collected on the 3rd of December, 1869, and were shoots of the tree, but no trace of alkaloid was found, perhaps owing to the above-mentioned supposition. They were macerated for at least twenty-four hours in distilled water, with the application of a gentle heat.

Report of Experiments made by Dr. Acheson, with a Mixture of Slacked Lime and Water as the Antidote for Tutu Poison.

"For some time past I have been experimenting on various animals with a watery extract of tutu, prepared by Mr. Hughes, pharmaceutical chemist of this town, and, at his request, I now state the result.

"I administered to a cat fifteen grains of the extract; twenty minutes after, the respiration became very frequent, slight twitching of extremities, and in five minutes more a severe attack of convulsions, which lasted about three minutes. Then, an interruption of ten minutes, followed again by a severe paroxysm, which lasted four minutes; again intermission of ten minutes, which was followed by a severe paroxysm of pure tetanic spasm, in which she expired. In this case, from the commencement of symptoms of poisoning, the slightest noise would invariably excite a recurrence of the paroxysm.

"2nd. I administered to a large dog half a drachm of the extract. Fifteen minutes after, breathing hurried, fæces expelled, vomited several times so severely that I was perfectly persuaded that the poison had been expelled. At the expiration of thirty minutes, tremors and slight twitching of the muscles of the extremities, and very much afraid to move out of one position. Then a severe paroxysm of convulsions, gnashing of teeth and frothing at the mouth, the paroxysm lasting about four minutes, then a remission of ten or twelve minutes, which was followed by the most severe and final paroxysm.

"In the above two cases, the extract had been prepared but two days.

"3rd. On the afternoon of the third day after the preparation of the extract, I administered the same quantity to a similarly sized dog. At the expiration of thirty minutes, it having produced no effect, repeated the dose in a *fluid* state. The double dose merely produced sickness and slight tremor.

"On the fourth day the extract had become very thin and watery, which led me to suppose that spontaneous decomposition had destroyed its poisonous property. I therefore increased the dose to two drachms, yet no symptom of poisoning.

"A few days after the above-mentioned experiments were made, I, with the assistance of Mr. Hughes, administered about a drachm of fresh extract to two dogs. To one of the dogs the extract was given in a mixture of lime and water. It remained in the stomach for several minutes before vomiting commenced. After the expiration of half an hour from the cessation of vomiting, we determined to administer a drachm of the extract alone, being merely dissolved in a little water. This he retained for twenty minutes without any vomiting taking place. We then administered to him a quantity of lime mixture. He never showed the slightest symptom of poisoning. To the other dog the extract was given in a quantity of water merely. A few minutes after administration, symptoms of poisoning commenced, and in twenty minutes he had a regular attack of pure tetanic convulsions. Immediately after the first paroxysm, we emptied into the stomach a quantity of the lime mixture, after which he had one severe fit, from which he recovered rapidly, and in the course of a very short period he was perfectly free from all symptoms of poisoning.

"We administered to a rabbit about thirty grains in the solution of lime, it never evinced the slightest symptom of poisoning.*

"In every case in which we administered the lime mixture the animal recovered rapidly, and when the extract was active it invariably gave fumes of ammonia on being mixed with lime.

"From what I have seen I am perfectly persuaded that lime is an antidote against the tutu poison; also, that by the fourth day of the watery extract it is almost inert.

"In every case experimented upon the animal remained perfectly conscious; indeed, the mode of attack and the appearance of the animal while in a paroxysm, strongly resembles poisoning by strychnia.

"G. H. Acheson, F.F.P.G.

"*Hokitika, April 5th*, 1870."

TUTU AS A DYE-WOOD.

Some woollen material, silk and linen, were boiled for a short time (half an hour to an hour), with some chips (the wood of the tree), afterwards treated with a hot solution of copperas. The colours were pure, from a neutral grey to a deep black, the dye varying in intensity according to the number of times the material was treated with the decoction of the wood. The dye is superior to that of logwood, inasmuch as it is pure. Woollen materials take it readily and well, silk is not so readily affected, and linen takes more time. The wood of the tree may be used as a substitute for logwood, and this property of the wood of the tree may be studied to advantage and profit.

[The results given in the above paper being somewhat at variance with those obtained by Mr. Skey (*loc. cit.*), they have been carefully re-examined in the laboratory, and Mr. Skey is of opinion that some of the reactions cited by Mr. Hughes are not satisfactory, for the following reasons:—

* Tutu does not act as a poison upon rabbits. I kept two of them for two days feeding upon tutu leaves, and afterwards gave them several large doses of the poisonous extract. I thought one of them appeared a little stupefied, but it would eat well enough notwithstanding.

1st. That the oil under examination must have been saponified by the processes employed.

2nd. That the temperature used was such as must have produced many bye products by destructive distillation, and, among others, acetate of ammonia, the presence of which would sufficiently account for the reactions Mr. Hughes attributes to the presence of an alkaloid.

3rd. That the action of lime, as an antidote, is not due to its decomposing an alkaloid, but to its forming an insoluble soap with the poisonous oil; and Mr. Skey still adheres to his opinion, that dilute acids should be administered in cases of poisoning by tutu.

4th. That the dyeing properties of the juice of the tutu plant are due solely to the abundance of tannin they contain, and are not analogous to the special dye principle of logwood (hæmatoxyline), for which reason he does not think that it can be used for dyeing any shade to which tan bark is not equally applicable.

Mr. Skey's views are explained in a paper, which must be deferred for future publication.—Ed. Trans. N. Zeal. Inst.]

Chapters for Students.

CHEMICAL NOTES TO THE PHARMACOPŒIA.

BY WILLIAM A. TILDEN, D.SC. LOND.

DEMONSTRATOR OF PRACTICAL CHEMISTRY TO THE PHARMACEUTICAL SOCIETY.

Plumbi Oxidum, PbO.—Out of the several existing compounds of lead and oxygen, this is the only one which exhibits a well-marked basic character; that is, which readily neutralizes acids, producing water and crystallizable salts as the result of the reaction.

Litharge, the ordinary form of plumbic oxide, is prepared by exposing melted lead to the oxidizing action of a current of air at a temperature at which the oxide melts.

[§ In heavy scales of a pale brick-red colour, completely soluble without effervescence in diluted nitric and acetic acids.] It rarely contains more than traces of impurities, chiefly the oxides of other metals, and a small quantity of red-lead, to which the colour is chiefly due. Plumbic oxide is slightly soluble in water, and is in any form strongly alkaline to test paper, and absorbs carbonic acid gas from the air. (See Liq. Plumbi Subacet.) It is easily fusible, and in that state rapidly dissolves silica: a mixture of lead-silicates constitutes flint-glass. The remaining oxides of lead are—1, an imperfectly known suboxide, Pb_2O; 2, brown plumbic peroxide, PbO_2, left when red-lead is treated with nitric acid; 3, red-lead or minium, which is a compound of plumbic oxide and peroxide, usually having the formula, $2PbO, PbO_2$ or Pb_3O_4.

Potassa Caustica.—[§ Hydrate of potash containing some impurities.]—Obtained by boiling down liquor potassæ in an iron dish. It is liable to the same contaminations as the solution from which it is made. Being very deliquescent, it must be kept in well-closed bottles.

Potassa Sulphurata.—This compound is prepared by melting together carbonate of potassium and sulphur, continuing a moderate heat until effervescence is over.

$$3K_2CO_3 + 4S_2 = \underset{\text{Hyposulphite.}}{K_2S_2O_3} + \underset{\text{Sulphide.}}{2K_2S_3} + 3CO_2.$$

[Watts, Pharm. Journ. Nov. 19, 1870.]

[§ Solid greenish fragments, liver-brown when recently broken. About three-fourths of its weight are dissolved by rectified spirit.]

The Pharmacopœia orders rather a larger proportion of carbonate of potassium than is required to satisfy the equation given above. The hyposulphite of potassium, when heated too strongly, decomposes into sulphate and pentasulphide.

$$4K_2S_2O_3 = 3K_2SO_4 + K_2S_5.$$

In addition to the two main constituents, hyposulphite and trisulphide, there may, therefore, be present carbonate, sulphite and pentasulphide of potassium.

This compound is decomposed by hydrochloric acid with evolution of sulphuretted hydrogen and deposition of sulphur.

Potassæ Acetas, $KC_2H_3O_2$. Carbonate of potassium is dissolved in a slight excess of acetic acid, and the solution having been evaporated to dryness, the salt is melted by the very cautious application of heat. The solution must be distinctly acid, and the salt barely fused, with least possible exposure to air, or the product will not be white.

[§ White foliaceous satiny masses very deliquescent, with a watery solution of which tartaric acid causes a crystalline precipitate ($KHC_4H_4O_6$), sulphuric acid the disengagement of acetic acid, and a dilute solution of perchloride of iron strikes a deep red colour (ferric acetate, $Fe_2 6 CuH_3O_2$). Neutral to test paper, entirely soluble in rectified spirit.]

CINCHONA CULTIVATION IN BENGAL.

The following Report from C. B. Clarke, Esq., M.A., Officiating Superintendent, Botanical Gardens, and in charge of Cinchona Cultivation in Bengal, to the Secretary to the Government of Bengal—(No. 269, dated Botanical Gardens, Calcutta, the 26th April, 1871),—has been received:—

Sir,—I beg leave to submit the annual report of the cinchona plantations near Darjeeling for the year ended 31st March, 1871, in which is included also the half-yearly report for the six months ended 31st March, 1871.

The cinchona plantations have lost, by early death, Dr. T. Anderson, who introduced the cultivation into Bengal, and under whose superintendence the present successful growing of cinchona has been brought about. In the opinion of his medical advisers, the unsparing zeal with which Dr. T. Anderson exposed himself personally in the steaming valleys of Sikkim cost him his life.

Dr. T. Anderson commenced the propagation of cinchona plants in Sikkim in 1862, but for several years little progress was made. Sinchul, Lebong, Upper Rungbee, and Rungyroong, were localities successively tried and found successively not well suited to the culture. The young stock was very unhealthy, and Mr. Mann informs me he then had to throw away young plants by thousands. Dr. T. Anderson also received, privately, the opinion of a very high authority, that cinchona could never be profitably grown in Sikkim.

Dr. T. Anderson, undaunted by these discouragements, and by the still more disheartening doubts which some of his best gardeners felt, applied himself steadily to the overcoming, one by one, of the difficulties experienced. And by 1867-68 these difficulties had been so far overcome, that he felt no doubt of economic success in the growth of *C. succirubra* and *C. calisaya*. When Dr. T. Anderson left for England in the spring of 1869, he left his successors merely to pursue in cinchona culture the plans of proceeding which he had brought into successful operation.

An official report is hardly the proper place to enlarge on the private loss sustained by the death of one who died deeply regretted by every one who knew him, but I may express here my opinion of the magnitude of the loss which science and this country have sustained by the death in early prime of a botanist, who simply said, that after nine years' continued study of Indian plants, he felt that he might now begin to publish with satisfaction to himself.

The year has been unusually wet, the rainfall being about 40 inches in excess of the average amount. The cold-weather six months, ended 31st March, 1871, have also been unusually moist, and growth, shown by the measured plants during the cold weather, is unusually large in consequence.

No improvement in the plantations of *C. officinalis* took place during the year: the number of plants returned in the table appended is but 440,000, which must be understood to mean that no fresh plants have been planted out since the last report, and that the number of deaths has not been counted. In accordance with the recommendation in paragraph 2 of the report of the cinchona commission, the *C. officinalis* is now being cut down. There is every reason to suppose that Dr. T. Anderson was right in attributing the failure of *C. officinalis* at Rungbee to the too great moisture, for on the drier slopes of Tukvar, north of Darjeeling, the president of the cinchona commission found a small experimental plantation of *C. officinalis* much superior to any part of the Rungbee plantations, and showing promise of making at least small trees.

The number of cinchona plants in permanent plantations was as under:—

	C. succirubra.	*C. officinalis.*	*C. calisaya.*
31st March, 1870 . .	1,055,100	406,899	4,000
30th September, 1870	1,219,715	440,000	24,860
31st March, 1871 . .	1,233,715	440,000	33,000
Total . .	14,000		8,140

Of *C. succirubra* there are also now 480,000 young plants (mainly seedlings) in the nursery beds. I may explain once more that the nature of the ground at Rungbee does not admit uniform planting. Where the ground admits, the plants are planted 6 feet by 6, and when 1200 have been put out, this is reckoned an acre of cinchona, a further allowance of 20 per cent. being made for filling up of vacancies. The vacancies are filled up once only, in the year succeeding that of planting.

In accordance with instructions received from the supreme Government, it was attempted to raise 500,000 plants in the nursery beds for planting out during the present season, and the jungle has been burnt on sufficient land to hold the 480,000 that have been raised. It has been observed, however, that as in the case of most other trees, the chief point to secure in planting out young cinchonas is that they shall start well; hence those parts of the plantations planted early in the season are found generally very superior to the autumn planted portions. It is therefore proposed to plant out as many of the 480,000 young succirubras as can be got out before the end of July, and to reserve the rest in the nursery beds for planting out in the early spring of 1872.

The *C. calisaya* is planted now at the same distance apart as *C. succirubra*, viz., 6 feet by 6; the early planting was 5 feet by 5, which was certainly too close. The number of "acres," therefore, of *C. calisaya* will be about thirty in permanent plantation; and this will be increased to about eighty during the present season.

The harvest of *C. calisaya* seed is good, and will suffice for a large extension of *C. calisaya* by seedlings next year.

I have to thank Herr Von Gorkom, director of the Government cinchona plantations of Java, for several valuable consignments of seed of *C. calisaya*, of which nearly every single seed germinated.

The plantation has been able to respond to all applications for seed of *C. succirubra* and of *C. officinalis*, but is likely for another year to have less *C. calisaya* seed than is wanted for its own requirements.

The general growth of the plantations of *C. succirubra* and of *C. calisaya* has been good during the year, and their present condition satisfactory. The number of deaths, except of plants during their first season out, which have been planted in swampy places, has been exceedingly small. Cinchonas planted where the water stagnates never grow at all, as Mr. McIvor has observed; and some members of the cinchona commission have suggested that a little more selection in regard to site of plantation might be advantageously employed. The ground for planting is cleared of jungle by burning, and it is very difficult to foresee that cinchona will not grow in any particular spot: for, however wet it may be, provided the water does not hang, cinchona may grow excellently; and on the whole the head gardener inclines to uniform planting, and filling up vacancies but once, as has been for some time the practice.

The important portion of the plantation is now Rishap, and I have prepared the subjoined table to show the growth of the measured plants there of the two species *C. succirubra* and *C. calisaya*:—

RISHAP.—*Altitude*, 2000 *feet*. *Planted* 29*th March*, 1867.

	Height in inches on 1st April, 1870.	Height in inches on 1st October, 1870.	Height in inches on 1st April, 1871.	Growth for six months ending 1st April, 1871.	Growth for twelve months ending 1st April, 1871.
C. succirubra, No. 1 .	129	159	179	20	50
" " 2 .	145	172	190	18	45
" " 3 .	129	161	190	29	61
" " 4 .	146	179	206	27	60
" " 5 .	158	166	199	33	41
" " 6 .	158	182	217	35	59
" " 7 .	105	133	154	21	49
" " 8 .	152	176	206	30	54
" " 9 .	135	144	160	16	25
" " 10 .	114	119	128	9	14
			Total . .		458
C. calisaya, No. 1 . .	136	180	184	4	48
" " 2 . .	137	165	184	19	47
" " 3 . .	136	164	177	13	41
" " 4 . .	126	142	159	17	33
" " 5 . .	129	146	158	12	29
" " 6 . .	138	162	182	20	44
" " 7 . .	138	169	192	23	54
" " 8 . .	130	159	174	15	44
" " 9 . .	129	156	169	13	40
" " 10 . .	138	168	183	15	45
			Total . .		425

This gives an average growth per succirubra-tree of 45·8 inches, and per calisaya-tree of 42·5 inches, during their fourth year out. Mr. M'Ivor describes the growth of the *C. calisaya* at Rishap as splendid during the first two years, and in some cases during the first three years. But I submit that these figures fully justify the unanimous statement of the gardeners at Rungbee, that the rate of growth during the first two or three years is subsequently maintained, or nearly so.

There is a numbered stick at the base of each measured tree, and as the height and continued growth of these trees is a fact which cannot be got over, I shall mention that they were measured by Mr. Kennedy, the gardener at Rishap; that the measurements have been verified by the head gardener in charge; and that, further, I measured these trees myself early in March, and am therefore able to state that the measurements sent down cannot possibly be materially in error.

But it has been asserted to me that the sticks at the base of the measured trees have been shifted. If this were so, it would deprive the measurements of all value, unless as to the "exceptional" growth of trees at Rishap, which is not a disputed fact.

I must, however, be permitted to show in detail that the sticks cannot (except in one instance, viz. *C. calisaya*, No. 2) have been shifted since the plants were put out.

First, I can state of my own knowledge that sticks have not been shifted since August, 1869, when I first saw the plantation; and secondly, the gardeners on the plantation state positively that no stick has been shifted since Mr. Kennedy (the gardener now in charge at Rishap) came there, upwards of three years ago.

The circumstantial evidence that these sticks (except *C. calisaya*, No. 2) have never been shifted, is exceedingly strong.

First, as to the ten *C. succirubra* sticks. The first eight sticks are placed regularly against one row of plants near the gardener's bungalow, and the sticks Nos. 9 and 10 are placed opposite two plants in the next adjoining row. It is tolerably clear that the gardener placed the sticks against a good row of plants near his bungalow, convenient for close observation. He selected as good a row as he could find close to the bungalow, but he might have selected a far better row if he troubled to go a few yards down the hill. As to sticks Nos. 9 and 10, they were placed in the next adjoining row, and certainly not against the two best trees. Indeed, No. 10 is about the worst tree in the row, and has (Mr. Kennedy says) always been so; and it was probably selected because it was the tree next the path and easy to get at to measure.

The trees being in rows, no one of the first eight sticks could have been shifted unless all were, which is clearly impossible; and as to sticks Nos. 9 and 10, assuming that they have been shifted, they must have been shifted disadvantageously to the measurement.

There remains in addition to these arguments Mr. Kennedy's very plain remark, that if he was to shift the sticks to one of the best rows of trees, he could show a very different admeasurement, as several trees in four years out have passed twenty-five feet, and very many have passed twenty feet.

Next we come to the ten *C. calisaya* plants. In this case one row of eight trees is taken, in which the sticks proceed regularly from one to eight, and sticks No. 9 and 10 are placed regularly in the next row. But the stick No 2 has been evidently removed at some time from the second tree, and now stands at the base of the eleventh tree.

A very slight examination of the second tree shows that early in life it lost its leader, which was doubtless the reason that the stick was shifted; but the tree No. 2 is now about as large as the others. The stick No. 2 was doubtless shifted very shortly after the plants were put out, and if it were put back to plant No. 2, the growth of the *C. calisaya* would stand as nearly as possible the same. The biggest *C. calisaya* trees are in an adjoining row to the measured row.

I should add that these measurements show less than the fair growth of the trees, because in order to avoid all cavil about shifting the sticks, or about cutting out the bad trees and leaving only the successful ones to be measured, the lines of the measured trees have not been thinned, so that the trees stand too thickly to show what the growth is in the plantation after thinning out. The growth in the small patch of plantation thinned out in the cold weather, 1869–70, is certainly greater than that shown by the measured trees.

The average growth of the measured plants is a fair index of what the cinchona trees are doing at the level 2000 feet, and below it; but the growth is steadily less as we ascend the hill, and in several parts of Rishap, at 3500 feet, is comparatively very small. A considerable portion of the 1868 and 1869 plantations, was planted at these higher levels, and will come into bark-bearing much later than the lower level trees. A large area of 1868 planting will not be fit for thinning before Christmas 1872–73, and this will so far diminish the amount of bark which I calculated on from next season's thinning. On the other hand, the Teesta plantations, which were so seriously damaged by fire and deer that they were reported, in June 1869, no longer worth report, have recovered wonderfully, and now exhibit patches which some members of the cinchona commission thought the finest in the whole Rungbee plantation. These trees are growing at an elevation of from 450 to 900 feet above the sea, and are covered with lichens. The policy at Rungbee has been for some time to push the *C. succirubra* high up, and reserve the low level ground for *C. calisaya;* but I do not now feel at all sure that this will not have to be altered, and that the low level ground lately handed over to the forest department may not hereafter be asked for again for cinchona. The ground is, however, much less saturated by springs and swamps at the upper levels, and though the growth is slower, the plantation stands more uniformly, less in patches, there than below.

With the continued growth of the older trees (*i.e.* those which have entered at least on their fourth year of growth out in the plantation). I feel no apprehension whatever that they may early die out; and as regards the opinion that 100,000 of such trees will die out within the current year, I do not think it necessary to lengthen this report by a particular attempt to refute it by argument, the time being so very short, and, if such a calamity be impending, any means of obviating it so impossible. Should it occur, it will be a most startling surprise both to myself and every gardener about the place.

A plant appeared sporadically among the *C. succirubra* plantations raised from Ceylon seed, which early attracted the attention of Dr. T. Anderson. In its powerful habit of growth and general appearance it much resembled *C. succirubra*, but yet clearly was not exactly that species. It was supposed to be a hybrid, and became known at Rungbee as *the* hybrid, to distinguish it from the various other casual hybrids. As the plants of it grew bigger, the head gardener was able to satisfy himself that it was no hybrid. Last year, at Dr. T. Anderson's suggestion, the bark of one tree, two years old, was sent home for analysis to Mr. Howard, whose report was most favourable; the quantities of total alkaloids and of crystallizable quinine being both rather higher than in our *C. calisaya* of the same age. As far as can be judged from the dozen specimens of this plant about the plantation, it seems a hardier plant even than *C. succirubra*, and to flourish both higher up and lower down than *C. succirubra* will. I accordingly instructed the head gardener in charge to get up some stock of it, and there are now 1000 stock plants of this species, so that it will be possible to propagate it and extend its cultivation very rapidly.

I received, about Christmas, two cases of *Cinchona pitayensis*, which were sent out by the Secretary of State from England in charge of Dr. Simpson, now civil surgeon of Patna, and which arrived in good condition. It is very difficult to judge of the species of cinchona while young; but this, nevertheless, carried such marked characters, that the head gardener became at once convinced that our unknown so-called hybrid was no other than *Cinchona pitayensis*.

When Mr. M'Ivor, however, arrived at the Rungbee plantations in February last, he at once recognized our hybrid as *C. uritasinga*, with which the analysis of the bark well agrees; but shortly after arrived Mr. Broughton, who doubted very much whether the plant could be *C. uritasinga*.

In the absence of flowers and fruit, no botanical determination can be attempted, and the similarity of the leaves of different species of young plants, as above stated, is so close, that the identification of this "hybrid" must still remain a problem to be solved. It is, however, doubtless destined to prove one of the most valuable species at Rungbee.

During the cold weather 1870–71 about 12,500 lb. of dry succirubra bark have been obtained from the thinning of the plantations. Of this, 5000 lb. of the thickest bark have been sent for sale in the London market, and the remaining 7500 lb. have been boiled at Rungbee. Owing to the imperfect working of the screw-press used in the manufacture, more bark could not have been cut unless we had been prepared to sacrifice all the thinner bark, which (being worth only about sixpence per pound) would scarcely pay for transit to England. To take three trees out of four (as was originally proposed), would have given us about 300 lb. of bark per 1200 trees, which was the estimate I formerly put forward. As, however, our means of working the bark were limited, only every alternate rank of trees was thinned out, and a considerable area of the 1867 planting was not touched at all. I am not sure that this curtailment of the thinning will be any loss ultimately. In this estimate of 300 lb. per acre of thinnings at the end of the fourth season out, it must be observed, however, that only 150 lb. of the best is worth 1*s*. 9*d*. per pound in London, the remainder is barely worth working up on the spot. The alteration proposed by the cinchona commission is that next year a portion of the prime bark should be worked up with the thinner bark at Rungbee, in order to give the process of manufacture a fair chance of proving remunerative.

After visiting the manufactory of cinchona bark at the Government Nilghiri plantations, by the orders of the Bengal Government in April, 1870, I came to the opinion that Mr. Broughton's method of preparing the alkaloids from red bark was an excellent one, and I was authorized by Government to introduce this process of manufacture experimentally at Rungbee. A sum of Rs. 11,250, for the expense of machinery, was placed at my disposal for the year ended 31st March, 1871.

The machinery which I have got under this sanction consists mainly of the following items:—

	Rs.	As.	P.
Boilers, cones, and presses made at the Government dockyard, and charged for merely by a book credit there. Grand total expended up to 31st March, 1871	5111	0	0
Further expenditure estimated requisite to complete the machinery now in hand	400	0	0
A Coffey fractional still, with rectifier, cost (in England)	1043	7	6
Scales and a hot filter, obtained from Messrs. T. E. Thomson and Co. . .	154	10	6
Carriage of machinery, and smaller expenses	490	9	6
Total Rs. . .	7199	11	6

I am glad to believe that the whole of this machinery (except the hot filter) is well adapted for the manufacture in question.

The only serious difficulty in carrying out the work of manufacture has been with the press. A large part of the expenditure at the dockyard, viz. about Rs. 2000, has been laid out on a hydraulic press, now ready for dispatch to Rungbee. The engineer at the dockyard has taken great pains with this press, which was seen in an advanced state by Mr. Broughton, and I am sanguine that it will answer the expectations formed of it.

The outlay on house accommodation for the manufactory has been very small, as bamboo sheds are inexpensively raised by the hill men. In the distilling-house there is much alcohol and many large fires, and I have lately replaced this shed by a brick building.

The stripping of bark can only be carried on advantageously in the autumn and spring, as during the rains the bark produces a much smaller percentage of alkaloid. During the working season, now nearly past, about 7500 lb. (dry) of the twig bark has been boiled down, and the first (lime) precipitate formed therefrom. The first sample of alkaloid sent down from Rungbee, made by the two gardeners (Messrs. Gammie and Biermann) and myself, was tried experimentally in the Calcutta hospitals, and found by Drs. Brougham and Macnamara excellent, and apparently of equal therapeutic value with the commercial sulphate of quinine. The second sample, of alkaloid manufactured at Rungbee was also found by analysis to be good. The third sample sent down to the medical store-keeper, Calcutta, has been discovered to contain 10·5 per cent. of metallic copper, and the cinchona commission recommended that the two gardeners in charge should cease working, and the distillation process has been accordingly stopped for the present. It was not understood to be possible that copper could appear in the resulting alkaloid, except in minute quantity; and even now that this serious accident has occurred, Mr. Broughton states (in the cinchona commission proceedings) that he can hardly conceive how it did occur.

I wish merely to remark here that, in my opinion, the occurrence of this accident has nothing whatever to do with the merits of Mr. Broughton's process. That process is the only one before us for obtaining the alkaloid economically from red bark, except the suggestion of steeping the bark cold; and I think it extremely improbable that the latter plan will eventually prove successful, since Mr. Broughton has discarded it after giving it what he considers a satisfactory trial.

The cost of working 1000 lb. of wet bark by Mr. Broughton's process at Rungbee has been reduced to Rs. 25, exclusive of cost of European superintendence. Great credit is due to Messrs. Gammie and Biermann for their ingenuity and perseverance in bringing the cost down so low. Mr. Gammie is particularly successful in executive work in any department to which he puts his hand, and Mr. Biermann is a man of superior education, as well as naturally clear-headed. It is considered by the cinchona commission that if the expense of carrying out Mr. Broughton's process of manufacture proves no greater than it has in their hands, no other process can possibly compete with it at Rungbee; and the cinchona commission have accordingly recommended that this process of manufacture be employed next season. It is perhaps hardly necessary to explain that, in conducting the work so as to give no copper in the result, a rather less cost is incurred.

The lime precipitate may be kept uninjured any length of time, and nearly the whole precipitate from the season's working remains thus now stored at Rungbee. Also none of the proceeds of sale of bark have yet been actually received, partly owing to the death of Dr. T. Anderson, to whose agents the earlier small consignments took place. I did not budget for any receipts from the plantation for the year ended 31st March, 1871, but I estimate that nearly Rs. 8000 worth of bark had been dispatched from the plantation by that date.

The cinchona budget grant for the year ended 31st March, 1871, was Rs. 64,741. The total amount drawn was Rs. 53,746-2-1, exclusive of the book credit of Rs. 5111 for machinery. Subtracting from this Rs. 53,746-2-1, the sums also actually paid out for machinery, there remains Rs. 51,631-15-2 as the actual current expenditure at Rungbee for the year. There is included in this the cost of the manufacture, in buildings, superintendence, labour, wood, charcoal, etc., and also the cost of cutting and stripping bark, drying, packing and dispatching it. There is also included a very considerable miscellaneous expenditure, as on fibrous plants, in collecting seeds, orchids and ferns, and packing and dispatching them. All these calls on the cinchona plantation, though apparently trifling where labour is cheap, really cost a good deal, as they require the supervision of a European gardener. These considerations must not be overlooked, or the cost of the Government plantations may appear too high as compared with that of private planting.

The plantation of the Darjeeling Cinchona Association at Pomong, which adjoins the Government Rungbee plantations, has been considerably extending its operations, and by the end of this spring there may be 1000 acres of *C. succirubra* on the Pomong plantation. The course taken by the directors of Pomong lends a strong support to the belief that cinchona will prove economically successful in Sikkim within a very limited time.

DISINFECTION.*

No. II.

In practising disinfection it has been sought either directly to influence the state of the atmosphere surrounding us, or else to operate upon the solids and liquids with which we come into relation more or less closely in the course of daily life; and, if we would have definite ideas on the subject, the distinction between these two methods of operation must be kept clearly in view.

The *direct* disinfection of the general atmosphere of a town is a task too hopeless to be undertaken by man; as will be manifest from the mere consideration of the vastness of the mass of air to be dealt with, and the comparative minuteness of the materials wherewith to deal with it. Not by one-tenth per cent. can all the breathing of all the inhabitants of a town, and the burning of all the fires in it, alter either the percentage of carbonic acid, or of oxygen in the general atmosphere pervading the town. If, then, our means of influencing the atmosphere are so limited that we cannot add to it so much as the one-tenth per cent. of any material, what chance should we have—even if we were to expend the entire national revenue on the undertaking—of so thoroughly dealing with the mass of the atmosphere pervading a town as to eliminate any impurity?

In the days of the cattle plague, those who were set in authority over us made an assault of this description on the atmosphere of the country. They swept the air of the fields with towels dipped in carbolic acid, and borne aloft on the horns of the cattle, hoping thereby to rid the air of cattle-plague germs. As well might they have tried to alter the composition of the water of the Irish Sea. The first step in practical disinfection is the comprehension of the fact that, whether it be poisons or germs we fear in the out-door atmosphere, we cannot remove them from it by the employment of anything either to decompose them or to kill them.

Leaving the streets and entering the houses, one thing at least is possible, and that is, to ventilate and secure that the air within the house is not much worse than the air outside. Obviously, too, the limited air of a room lies within the compass of the action of such quantities of chemicals as we are able to command. But whether it is economical to attempt the purification of the air of a room by acting upon it by chemicals, or whether the means which are in vogue are effectual, are other questions. The last we will now take up.

We have before us an excellent little card (excellent we say in the sense that it affords a graphic representation of the more useful expedients) bearing on it the inscription "Disinfectants and how to use them," by Edward T. Wilson, M.B., F.R.C.P.; and among other directions are the following:—

"*For an Unoccupied Room.*—Pour two wineglassfuls of dilute sulphuric acid (oil of vitriol) over two ounces of chloride of lime in an earthenware saucer, placed high near the window. It bleaches and is apt to make whitelimed walls sweat. Useful for cabs.

"*For an Occupied Room.*—Put a crystal or two of chlorate of potash into a saucer of muriatic acid (spirit of salt) placed high, as the gas is heavier than air."

We presume that the rooms are of ordinary dimensions; say 14 feet square and 10 feet high, and for convenience of calculation let us take the contents of a room 4 metres square and 3 metres high. This gives 48 cubic metres, or 48,000 litres capacity. Now from the 2 ounces of bleaching powder we should do well if we got 5 litres of chlorine gas. We have, therefore 5 volumes of chlorine in 48,000 volumes of air, or about 1 volume of chlorine in 10,000 volumes of air; or, in percentage, 0·01. This is for the *unoccupied* room, but for the *occupied* room the proportion of chlorine (from the crystal or two) would be very small indeed.* Chlorine so highly diluted is not the energetic reagent that it is when pure. If there were traces of sulphuretted hydrogen in the atmosphere of the room, they would co-exist for a long time with so weak a gaseous mixture of chlorine, and germs would probably be untouched by it. In short, such a chlorinous atmosphere, though dreadfully disagreeable to human inhabitants, might be organically impure.

The card from which we have quoted falls foul of scents. "Scents are useless," says the card, after having recommended how we may make the sick-room stinking under pretext of purifying its atmosphere. Wiser far were it to make it fragrant with perfumes, which, if they neither decomposed the organic poison nor killed the germs, would delight and not distress the patient. Dr. Wilson's card, although recommending fumigation, does not omit to recommend ventilation and to enforce the necessity of it, and herein he has our most cordial assent.

In fine, if the atmosphere of a room be foul, let it out; which is the cheapest and wellnigh the only practicable, if not the only possible, method of improving it. The proper sphere of disinfectants is the solids and liquids which harm us either by direct contact with our bodies or by their proximity to us and action on us through the atmosphere, the purity of which may to a great extent be preserved by suitable means. How this may be done will form the subject of another notice.

* Reprinted from the *Lancet*, Sept. 30, 1871.

* Some notion of the quantity of chemical substance requisite to effect a real disinfection of the atmosphere of a dwelling-room of ordinary dimensions may be gathered from a recent Oxford disinfection minute, which prescribes 4 oz. of sulphur to be burnt in every 100 cubic feet of air. Sulphur yields twice its weight of sulphurous acid, so that there would be about 80 litres of sulphurous acid gas to 3000 litres of air, equal to 2·6 vols. of gas in 100 vols. of air. The minute informs us that "no disinfection of this kind is thorough if a man can live in the room whilst it is going on," from which we see that it cannot be resorted to for the sake of the atmosphere in the room (which must be sent up the chimney or out of the window, and replaced by fresh air, before the room becomes habitable), but for the sake of the walls, and ceiling, and clothes hung up on poles, etc. In short, it is a method of treating the solids.

The Pharmaceutical Journal.

SATURDAY, OCTOBER 14, 1871.

Communications for this Journal, and books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed* "*Pharm. Journ.*"

THE CHIPPENHAM CASE.

THE question, as to the propriety of using a strong solution of corrosive sublimate for the cure of ringworm, would be so much more appropriately discussed in the columns of a medical journal, that we rejoice to find Dr. Fox's letter of this week is to be a final one; and, for the sake of Dr. MEERES, we hope the matter will now be allowed to drop. In taking leave of it, we note with pleasure the unanimity with which our medical correspondents recognize the service not unfrequently rendered by pharmaceutists both to the writers of prescriptions and to the patients for whom they are intended. Most of our readers who have had any large experience in dispensing will be able to call to mind instances, such as those mentioned by "Thirty Years M. P. S.," where that service has been most signally beneficial. But we agree with Dr. Fox in thinking this somewhat irrelevant to those points in the Chippenham case which were commented upon by "M. P. S.," and we are equally of opinion that Dr. Fox's indignation was irrelevant to the remark of "M. P. S.," which seems to have been so obnoxious; for even if that remark were unfounded, what would be more natural in the case of one who did not "set himself up as a judge of therapeutics as against properly qualified physicians"?

As we understand it, the real purport of the letter signed "M. P. S." was to urge the necessity of promoting a kindly feeling between medical men and pharmacists, inasmuch as both have duties to perform involving serious responsibilities and the possibility of mischances capable of being disastrous to themselves and to others. As already stated, we do not by any means adopt the views of our correspondent "M. P. S.," and in justice to him it must be remarked that he wrote under the influence of the verdict found by the jury in the Chippenham case; but we thoroughly agree with his conclusion, and are convinced that whatever grounds there may be for dissatisfaction between medical men and pharmacists, they are more likely to be removed by the exercise of mutual consideration than by indulging in contemptuous cynicism.

While speaking of this matter we cannot refrain from noticing Dr. Fox's complaint that our correspondents miscall his bichloride preparation "a lotion;" and it seems to us this is an apt illustration of that perversity which does so much to frustrate protective regulations against accidental poisoning. Just in the same way that Dr. Fox's "parasiticide" is called a lotion, do people sometimes swallow an embrocation in place of a cough mixture, and ignore the "poison bottle" as much as it would seem is the case with Dr. Fox's preventive classification.

We prefer leaving to the consideration of medical critics the efficacy of skin *tanning* as a preventive against absorption.

"CORASSA COMPOUND."

A GENTLEMAN to whose name the initials M.D., LL.D., etc., are appended appears to have recently provided, for the benefit of the American public, a preparation which he calls the "Corassa Compound." An inquiring correspondent of the Chicago *Pharmacist*, having met with a sample in the course of his business, took the trouble to examine it, and reports the result to that Journal. Upon placing the specimen—which appeared to be of a light fawn colour, resembling Dover's Powder—under the microscope, it was found to consist of three powders of different colours and degrees of division. These were separated by sieves of the requisite fineness, and proved to be gentian, sugar, and cochineal in about the following proportions:—

Powdered Sugar . . .	24
" Gentian . .	8
" Cochineal . .	1

There is just a *soupçon* of surprise perceptible in this gentleman's information, that the preparation is sold at three dollars (about twelve shillings) an ounce; but he has evidently lost sight of the string of consonants following the maker's name. Some of our correspondents have been occasionally so unsentimental as to express doubts whether in the acquisition of honorific titles the game is worth the candle. We hope they will be comforted and encouraged by this fresh evidence of the intrinsic value of such distinctions.

THE botanical library of the late Professor LINDLEY, which was purchased out of the surplus funds of the International Horticultural Exhibition of 1866 and deposited in the rooms of the Royal Horticultural Society at South Kensington, has been arranged and catalogued. Considerable additions have been made to the library by gift, and it is intended to serve as a nucleus of a consulting library for the use of gardeners and others. The trustees have just issued a circular stating that the library is now open for the use of the public under certain regulations.

Transactions of the Pharmaceutical Society.

The following is a list of donations to the Library to October 4th, 1871:—

Chemistry: General, Medical and Pharmaceutical, including the Chemistry of the United States Pharmacopœia: from Professor Attfield (Author),—Calendar of King's College, London, for 1870-71,—Edinburgh University Calendar, 1871-72,—Reports of the Thirty-eighth, Thirty-ninth and Fortieth Meetings of the British Association for the Advancement of Science: from Mr. Bremridge,—Introductory Address, delivered at the opening of the Session 1870-71, Queen's College, Birmingham: from Dr. Alexander Fleming,—The Ninth Annual Report of the Birmingham Free Libraries' Committee, 1870,—Reports, etc., of the West Kent Natural History, Microscopical and Photographic Society, 1870,—Report on Barracks and Hospitals, with descriptions of Military Posts: from the Surgeon-General, U. S. War Department,—Proceedings, etc., of the American Pharmaceutical Association, 1870,—Sketch of the Present State of our Knowledge respecting the Action of Mercury on the Liver: from Dr. T. R. Fraser,—On Dyspepsia, by Dr. Le Guillon,—Coleccion de Medicamentos Indigenas y sus aplicaciones, por Geronimo Pompa; Cuarta Edicion (Notulas adjunxit G. A. Ernst): from Dr. Ernst,—La Matière Médicale à l'Exposition de 1867, par J. Léon Soubeiran et Augustin Delondre; Histoire Botanique et Thérapeutique des Salsepareilles, par Ed. Vandercolme: from Dr. Soubeiran,—General Index to the first Fifty-three Volumes of the Medico-Chirurgical Transactions: from the Royal Medical and Chirurgical Society,—Annual Report of the Board of Regents of the Smithsonian Institution, 1869,—De l'Alimentation des Enfants et des Adultes dans une Ville assiégée et en particulier de la Viande de Cheval, par Edme Bourgoin; Des Alcalis organiques, par Edme Bourgoin; Du Blé, sa Valeur Alimentaire en Temps de Siége et de Disette, par Edme Bourgoin; Recherches Chimiques et Physiologiques sur la Nature des Principes purgatifs du Séné de la Palte, par E. Bouchat et Edme Bourgoin: from M. Edme Bourgoin,—Naval Hygiene, by Joseph Wilson, to which is appended, Moving Men on Shipboard, by Albert C. Gorgas: from the Medical Department U. S. A.,—Ueber Stärke und Cellulose; Uebersicht der Cinchonen, von Dr. Weddell: from Dr. Flückiger,—The Pharmacist (seven numbers): from Mr. D. Hanbury,—Om Marienbad dess Helsokällor och Bad; Om Karbolsyra: from Dr. N. P. Hamberg,——Bombardement du Muséum d'Histoire Naturelle de Paris par l'Armée Allemande en Janvier, 1871: from the Société Botanique de France,—Notes on the Quinquinas, by H. A. Weddell: from Mr. James Collins,—De l'Organisation de la Pharmacie dans les Principaux États de l'Europe, par C. Labélonye: from Mr. E. J. T. Agnew.

Provincial Transactions.

NORWICH CHEMISTS' ASSISTANTS' ASSOCIATION.

The Annual Meeting of the above Association was held at the Rooms, September 25th.

The President, Mr. Alfred Hill, in opening the meeting, said it was not his intention to detain them with an address, as the progress of the Society would be laid before them in the various reports. In the unavoidable absence of the Treasurer, he called upon the Vice-President to read the Financial Report.

Treasurer's Report.

Dr.	£.	s.	d.
42 Members' Subscriptions	22	1	0
19 Honorary Members' ditto	9	19	6
Donations	15	18	0
Donation for Books from Thomas Hyde Hills, Esq.	5	5	0
Library Fines	0	3	0
Fees from Latin Class	2	9	0
	£55	15	6

Cr.	£.	s.	d.
Rent	10	0	0
Rates	2	10	0½
Furnishing	16	12	10½
Gas Fitting	2	7	6
Gas and Firing	1	17	8
Cleaning	2	18	8
Printing, Stationery and Postage	1	17	9
Books	5	6	11
Chemicals and Apparatus	2	10	6
Materia Medica Specimens and Bottles	1	14	8
Sundries	0	3	9
Latin Tutor	4	5	0
Balance in hands of Treasurer	3	10	2
	£55	15	6

The Vice-President, Mr. E. Nuthall, then drew the attention of the meeting to the fact that the amount paid by the members of the Latin class fell far short of that which had been paid the tutor by the Association, and stated that this deficiency was mainly caused by four members declining to pay the fees.

Mr. F. D. Smith said that his presence there that night was owing to his desire to clear up a misunderstanding which evidently existed between the Council and the four members just mentioned. These latter were in his employ, and they stated that they did not feel themselves called upon to pay any fees beyond the annual subscription to the Association, as when the Association was formed it was stated that Latin would be included among the subjects taught by the Association.

Mr. Nuthall related in full the history of the Latin class, stating that such a class had been started by a member of the Association, but as the pupils expressed preference for a paid tutor, and offered to pay extra fees for the same, the Council entered into an engagement with Mr. Lowe. Before the commencement of each course the students were informed what fees would be required of them, and he maintained that it was scarcely justifiable for any of the gentlemen to take advantage of the class and then decline to pay.

These statements being borne out by the members of the Latin class present, after further discussion, in which Messrs. Tooke, Martin, Mason and Lincoln took part, Mr. Smith declared himself satisfied that the young men ought to pay unless they were willing to be considered as defaulters.

The President then called upon Mr. Nuthall to read the Secretary's report.

The report of the Materia Medica class, under the care of Mr. A. J. Caley, was very satisfactory. It met during the past winter months. The members were attentive and well-conducted. The class assembled nineteen times, and the average attendance was sixteen.

Eighteen evenings during the past winter and spring were devoted to the Botanical class, under the care of Mr. Octavius Corder; at first it was well attended and considerable interest displayed by those present, but towards the close the numbers fell short of what was anticipated. The average attendance was rather above thirteen.

The course of botanical studies embraced both structural and general botany, as also a description of the Natural Orders required by the Council of the Pharmaceutical Society.

The General Chemistry class, which was held during the winter months under the care of Mr. Nuthall, met twenty times, and the average attendance was twelve. At the outset the number of students was much larger; but as the charm of novelty wore off, and it became apparent that the class supplied but little assistance for a "Minor Cram," the attendance diminished. To those few who attended the entire course, great praise is due for their application. The course comprised chemical physics, the practical consideration of sp. gr., the laws of combination by weight and volume, chemical nomenclature and notation, the properties of the gaseous elements and of the metals of the alkalies and alkaline earths, together with practical testing for the latter.

The Latin class met during the first six months of the present year, and the course consisted of those subjects required for the Preliminary Examination, but only three students were sufficiently prepared to enter for it. The class nominally consisted of eleven pupils, but after the passing of the three gentlemen mentioned, only six members were left, two having discontinued their attendance.

The Library has been open thirty-six times for the purpose of renewing and exchanging books, since the first issue on February 27th.

It at present contains sixteen volumes, which have been circulated among nineteen members. It is found that such books as Attfield's 'Chemistry,' Bentley's 'Botany,' etc., which are best adapted to the requirements of those preparing for the Minor Examination, are preferred by the majority of members, as it is frequently necessary to give notice in order that these books may be secured.

The bye-laws relative to the Library and Museum meet with general satisfaction. It is thought, judging from the manner in which the library of this Association is appreciated, that it has already proved beneficial.

In addition to the regular classes, other sources of instruction have been provided, consisting of three lectures by Mr. F. Sutton on Chemistry; four on Pharmacopœia Tests, by Mr. A. J. Caley, and three on Chemistry, by Mr. Nuthall. A monthly botanical gossip, conducted in the spring by Mr. O. Corder, was discontinued in consequence of inattention displayed by members. Three pharmacy gossips were also conducted by Mr. Nuthall.

Very few members have passed examinations during the past year (namely, one the Major, two the Minor, and four the Preliminary). This is accounted for by the fact that the senior members, with one or two exceptions, had passed either the Minor or Modified Examinations before the formation of this Association. But it is expected that many of the apprentices will be enabled to pass during the ensuing year.

There is another source of information which is almost uniformly neglected. Through the kindness of several members and honorary members there is a large collection of loan books for use on the establishment; but these are rarely removed from the shelves, the members not yet having learned to consider this as a reading-room after class hours.

Besides the donations noticed in the Treasurer's Report, the following donations, etc. have been received:—

A grant from the Pharmaceutical Society of £8. 8*s*. for the purchase of botanical and chemical diagrams, the same remaining the property of the Pharmaceutical Society for three years.

The Pharmaceutical Journal: from the Pharmaceutical Society.

Engravings of the late Dr. Pereira, William Allen, and Jacob Bell: from Thomas Hyde Hills, Esq.

Valuable Book of Prescriptions: from J. Ince, Esq.

Collections of loose Prescriptions: from Mr. Fox, Leamington, and Mr. Attmore, King's Lynn.

A Collection of Chemicals: from Mr. Robinson, Orford Hill.

Several Materia Medica Specimens: from Messrs. Caley and Corder.

Several books: from Mr. N. Lincoln.

Volumes (bound) Pharmaceutical Journal: from Mr. J. English.

The Vice-President said the cause of his reading these reports was owing to having, with the valuable assistance of Mr. Mason, undertaken the duties of Secretary during the past five months, in consequence of the difficulty that had occurred in finding a successor to Mr. Grimditch.

When the report had been read, Mr. F. D. Smith said that after the account of so much work done, he felt compelled to propose a vote of thanks to Messrs. Sutton, Caley, Corder and Nuthall, who had given up so much time for the various classes and lectures. Seconded by Mr. Neal.

Mr. De Carle moved a vote of thanks to the honorary members, to whom the success of the Society, in a pecuniary aspect, was to such a great extent due. Seconded by Mr. T. C. Pitts.

Mr. Smith, in acknowledging the same, said that however much the financial success was owing to the support of the honorary members, the ultimate success depended upon the young men themselves, and he expressed a hope that during the ensuing year the attendance of students would be larger and more regular than exhibited in the report.

Votes of thanks were also passed to the donors who had come forward so liberally in commencing the Society; Mr. Ellwood for undertaking and ably carrying out the duty of Librarian; and to Messrs. R. C. Pitts and Gardiner for the careful manner in which they had audited the accounts.

The President now explained that the object of holding this meeting a week before its proper time was to ascertain whether the members were desirous of carrying on the Association another year. He thought that the falling-off in attendance which had been noticed, indicated a lack of interest on the part of the members, and unless there seemed a prospect of a change in that respect, he thought they would scarcely be justified in asking the honorary members to continue their subscriptions.

It was unanimously resolved to carry on the Society.

The President then stated that although the present Council would retain their functions until the end of the month, it was thought advisable to elect their successors at the present meeting.

Mr. Tooke said before they proceeded in the election of new Councillors, he thought it incumbent upon them to express their gratitude to the then existing Council for their unremitting and successful efforts in promoting the welfare of the Association, and proposed a vote of thanks to them collectively. This was seconded by Mr. Neal.

After the President had returned thanks, Mr. Lincoln said he had not anticipated that the meeting would allow their Council to be disposed of in one vote, and for his part must propose a separate vote of thanks to Mr. Nuthall, remembering that it was owing to him and Mr. Perkins that the Association had been started; seconded by Mr. Woolnough.

Mr. Nuthall briefly acknowledged the compliment.

The following gentlemen were then elected officers for the ensuing year:—*President:* Mr. Alfred Hill. *Vice-President:* Mr. Edwin Nuthall. *Treasurer:* Mr. W. J. Gooch Butler. *Secretary:* Mr. George C. Fox. *Council:*—Messrs. Canham, Goodenough, Elwood, Lincoln, and Martin.

After a spirited discussion, and various divisions, it was resolved that the class teachers be requested to restrict their subjects to those required for the Minor Examination; that the rooms be open three nights a week in the winter months; that the Preliminary class be held at the rooms; and that the pupils of the latter class be assisted in engaging a tutor, as far as possible, from the funds of the Association.

After a vote of thanks to the Chairman, the meeting dissolved.

LIVERPOOL CHEMISTS' ASSOCIATION.

Annual Meeting.

Session 1870–71.

The Annual Meeting was held at the Royal Institution, September 28th, 1871; the President, Mr. John Abraham, in the chair.

Mr. Robert Jennings was elected a member, and Messrs. George H. Damsell, Thomas Banner, jun., and Henry S. Shelmerdine were elected Associates of the Association.

The Hon. Secretary then read the Annual Report.

Annual Report.

In laying before you the Twenty-Second Annual Report, your Council have still cause to congratulate you upon the continued usefulness of your Association.

During the past Session 10 members and 6 associates have been elected; 10 have resigned, or by death or removal have ceased to belong to our ranks, leaving 127 at present on the roll.

The Chemistry Classes, in connection with the School of Pharmacy, have been conducted by Mr. Edward Davies, F.C.S., etc., and his Report gives your Council great encouragement for the continuance of them. The Materia Medica and Botany Classes, conducted by Dr. Carter, B.Sc. F.R.C.S., your Council regret have not been so well attended. The Chemistry Classes will be continued during the winter months by Mr. Davies, whose attainments and ability in teaching give an assurance of the greatest efficiency, and your Council will make arrangements for holding Materia Medica and Botany Classes during the spring and summer months.

The papers read at the fortnightly meetings have attracted considerable interest, and much information has been elicited during the discussions which followed. The majority of subjects have been connected with scientific chemistry. Your Council will be glad to receive papers during the ensuing Session upon subjects more intimately connected with pharmacy, materia medica, and botany; they also invite more miscellaneous communications from members who have not yet advanced the interests of the Association by assisting its objects in this way, and short papers by those who do not wish to occupy the entire evening.

Your Library has been enriched during the past Session by the appropriation of the grant from the Bell and Hills fund; a valuable collection of MS. prescriptions from Joseph Ince, Esq., F.C.S., F.L.S., etc., of London, and several other important contributions, and your Council congratulate the Association upon the fact, that the Library is so well stored with standard works upon chemistry, materia medica, botany and pharmacy, that it was found difficult to determine what books could be advantageously added, and they are mainly indebted to Professor Attfield for the selection. The Librarian reports that many members have availed themselves of the advantages of these valuable stores. 300 books have been taken out during the Session, and several applications have been made for the leading works which could not be met, and your Council are glad to find that the Library is of great service to members who make constant use of it for reference.

Your Association was invited to send a deputation to meet the Committee of the Liverpool School of Science, to discuss the advisability of establishing a science college in Liverpool; your Council appointed a deputation, but nothing definite has resulted.

In compliance with the instructions of an ordinary meeting of the Association, your Council called a meeting of the chemists and druggists of Liverpool on the 10th of March, "To consider the proposed compulsory Regulations for the keeping, storing and dispensing of Poisons," at which resolutions were adopted adverse to *compulsory* regulations, and they were forwarded to the President of the Pharmaceutical Society.

The Funds of your Association have been enriched by the liberality of the Local Committee of the British Pharmaceutical Conference, and this enabled your Council to hold their eleventh conversazione, at which about 400 members and friends of the Association assembled. Your Council are indebted to Professor Roscoe, F.R.S., for his exhaustive lecture upon "Solar Chemistry," illustrated throughout by numerous beautiful experiments; to Mr. Edward Davies, F.C.S., etc. for his interesting and illustrative lecture upon "Modern Explosive Compounds;" to Mr. Albert H. Samuel for his illustration of "Tyndall's Theory of the Cause of the Blueness of the Sky," and to the several microscopists and contributors of scientific novelties, etc. which enabled your Council to entertain their guests in such a manner as to make this one of the most successful conversaziones ever held by the Association.

Your Council were invited to send delegates to the meeting of the British Pharmaceutical Conference at Edinburgh in August, and Messrs. Shaw, Mason and Dr. Edwards attended as a deputation from your Association.

The following members of Council retire by rotation, and are eligible for re-election:—Messrs. Abraham, Redford, Shaw and Sumner.

Your Treasurer will present a report of the finances of the Association which shows a credit balance of £9. 4*s*. 10*d*.

The Treasurer read the financial report.

Financial Report.

The Liverpool Chemists' Association in account with John Shaw, *Treasurer. Session* 1870-1871.

Cash Received.

	£	s.	d.
102 Members' Subscriptions	51	0	0
5 Members' Subscriptions Arrears	2	10	0
2 Members' Subscriptions Half-Session	0	10	0
14 Associates' Subscriptions Half-Session	3	10	0
Balance from Local Committee of Pharmaceutical Conference	32	15	4
Microscopic Fees	0	2	6
Library Fines	0	3	1
Total	£90	10	11

Cash Paid.

	£.	s.	d.
Balance from 1870	14	15	3
Rent	10	10	0
Tea, Coffee, and Attendance	10	11	2
Insurance	1	0	0
Books and Periodicals	4	2	11
Printing and Stationery	12	14	6
Directing and Delivering Circulars	6	8	2
Collector's Commission	1	18	9
Librarian	4	0	0
Balance of Expenses of Conversazione	12	2	10
Expenses calling Meeting in reference to proposed Poison Regulations	1	16	2
Secretary's Expenses	1	6	4
Balance in hand	9	4	10
Total	£90	10	11

Examined and found correct, September 28th, 1871.

Albert Henry Samuel, } *Auditors.*
Charles Sharp. }

Mr. Charles Jones moved "That the Report as read be adopted, and together with the Transactions of the General Meetings, the Laws and Bye-Laws, the Catalogue of Books in the Library and the List of Members, be printed and circulated among the members." He was pleased to hear that the classes in connection with the School of Pharmacy had increased, in comparison with former sessions, and as it was the principal part of the business of the Association to provide classes for Pharmaceutical students, he hoped they would continue to avail themselves of these advantages. He congratulated the members upon being in possession of so valuable a library, to which he hoped they would soon be able to add Sowerby's 'Botany.'

Mr. ALFRED E. TANNER seconded the resolution, which was carried unanimously.

The meeting then proceeded to the election of four members of Council in place of Messrs. Abraham, Redford, Shaw and Sumner, who retired by rotation.

The result of the ballot was that the retiring members were re-elected.

The PRESIDENT stated that at the end of the session Mr. Davies invited the students in the Chemistry Class to attend voluntarily a written examination, the result of this was so gratifying that he and Mr. Davies had decided to award prizes to the two students who obtained the highest number of marks; he had therefore much pleasure in presenting the first prize, Pereira's 'Materia Medica,' to Mr. Abbott; the second, Bowman's 'Practical Chemistry,' to Mr. Jackson.

Mr. REDFORD moved, "That the best thanks of this meeting be given to the donors to the Library and Museum, and to the authors of papers during the past session."

Mr. F. TAYLOR seconded the motion; carried unanimously.

Mr. CHARLES BLOOD moved, "That the best thanks of the meeting be given to the Officers and Council for their valuable services during the past session."

Mr. T. F. ABRAHAM seconded the motion; carried unanimously.

The PRESIDENT, TREASURER, and SECRETARY returned thanks.

A discussion arose upon the desirability of having a collection of MSS. prescriptions in the library. The Secretary referred to Dr. Syme's proposal of last session to fill up a book, if the Council provided one; it was finally decided to lay the matter before the Council, and announce their decision upon the circular calling the ordinary meetings.

A vote of thanks to the Chairman having been carried by acclamation, the meeting separated.

The following arrangements are announced for the Session 1871–72, of the School of Pharmacy, in connection with the Liverpool Chemists' Association:—

A course of lectures on inorganic chemistry, preparation of chemical products used in pharmacy, qualitative and volumetric analysis, by Edward Davies, F.C.S., etc., lecturer on experimental physics in Queen's College. Each lecture will be followed by questioning upon the previous lecture, and will be illustrated with experiments.

The course will commence on Friday, October 13th, from 5.30 to 7.0 P.M., and will be continued on successive Fridays until the end of March, 1872, at the laboratory, 17, Back Colquitt Street (off Seel Street). Fee for the course, one guinea.

Pharmaceutical Students will be received at the laboratory for the study of practical chemistry, at any hour between 9 and 5 o'clock. Fee one guinea and a half for three months, two hours per week.

Students wishing to attend these lectures must send their names to Mr. Davies, at the laboratory, on or before October 13th, from whom further particulars may be obtained.

Arrangements will be made for holding classes in materia medica and botany during the spring and summer months, particulars of which will be duly announced.

GLASGOW CHEMISTS AND DRUGGISTS' ASSOCIATION.

The Annual General Meeting of this Association was held on Wednesday evening, 4th instant, in Anderson's University; Mr. Thomas Davison, President, presiding. The attendance was good. After the usual preliminary business, the Secretary (Mr. J. M. FAIRLIE) was called upon, and read the—

ANNUAL REPORT FOR 1870–71.

Your Council has much pleasure in presenting an epitome of the proceedings of the Association during the past year; and they are proud to state that, in most respects, the Association has made a marked improvement on any preceding year. The membership has reached the large number of one hundred and thirty-six (upwards of thirty of whom are employers). This increase of about fifty to the membership of last session may be accounted for in several ways; first, the fact that we now hold our meetings in our own hall, and within the walls of Anderson's University; second, the necessity for education among the younger members of the business, and the very encouraging prospect your Society has of being able to carry out special classes suited to the wants of Pharmaceutical students; third, the great assistance your Association received from Dr. R. Carter Moffat, Professor Henneday and Dr. D. C. Black by lectures, etc., and the liberal support you have received financially at the hands of several of the wholesale houses, especially the Glasgow Apothecaries' Company, and last, though not least, the fact that Glasgow chemists generally have at length been aroused to a due sense of their position in regard to pharmacy in the kingdom.

The remodelling of the constitution and the raising of the annual subscriptions, were necessary adjuncts to the change in the place of meeting, and it is hoped that the care bestowed on the compiling of the several rules, may be felt and appreciated by their remaining the guide of future councils for many years to come; and we trust that the increased subscriptions, which, properly speaking, will commence with the ensuing session, may not debar any from joining us, but that every one will do their utmost to make next session even more successful in point of numbers than the one just brought to a close.

As usual a syllabus of business was issued at the commencement of the session, which was well adhered to throughout; fourteen meetings were held in all, and the average attendance could not be less than sixty. Mr. Hennedy's two lectures on "The Histology of Plants" was the first point of interest; then we had three lectures from Dr. Moffat of the usual instructive and interesting nature. The event of the session, however, was Dr. D. Campbell Black's address on the "Relation of Prescriber to Dispenser." This address was published in full in the PHARMACEUTICAL JOURNAL; several of the medical journals took notice of it by giving extracts and leaders favourably criticizing its contents; while your Society printed and circulated four hundred copies. All this speaks largely for the interest it created not only in and around Glasgow, but throughout the whole country. We believe it has been the means of bringing before the country, more prominently than anything else, the anomalous position in which the dispenser is placed in and around this large city; and we hope the day is not far distant when there shall be an entire separation of the two professions.

The several papers read by members of the Association and the discussions which took place at the meetings, will, we think, compare favourably with those of any other association of similar pretensions. One member specially deserves mention, he having prepared and read two very practical papers, and passed two of the Pharmaceutical Society's examinations in the course of the session, an example well worthy of imitation.

We are glad to record that the Annual Festival, which has always been such a prominent feature in our programme of business, came off this year with its usual success. Your Council would, however, recommend that, as an educated body, we should adopt some other means of meeting socially, and thus raise ourselves above the common mode of trade gatherings.

The revival of the poisons regulation question was another feature in the business of the session, and we were glad to notice that the example set by your Association, of "actions not words," was followed by other associations throughout the country, and that their combined action had the effect of causing the Council of the Pharmaceutical Society to withdraw the compulsory part of the regulations. This, however, did not complete the agitation on the question. At the Annual Meeting of the Pharmaceutical Society, held in May last, at which your President attended to watch our interest, the question was again brought up, and but for the determined efforts of Mr. Mackay, of Edinburgh, and some other leading gentlemen in connection with the Society, it was just possible they might have been forced upon us by a "side wind." But the defeat the advocates of compulsory regulations sustained at this point did not put an end to the question; either through some misleading idea of the medical officer of the Privy Council, backed, we are sorry to say, by some influential and respected gentlemen connected with the Pharmaceutical Society, or, perhaps, a determination on the part of some leading members of the present Government to lay down certain rules for our guidance, a Bill was introduced into Parliament, the history of which is no doubt known to all. Suffice it to say, that in Glasgow we had two very successful meetings of the trade, attended by both town and country members, at which no uncertain sound was given regarding this question, and out of which sprang the "West of Scotland Chemists' Defence Association." This body sent a deputation to London, also a petition to Parliament against the Bill, signed by sixty-five Registered Chemists within the city in eight hours' time, besides circulars, addresses and memorials to the trade in Scotland, members of Parliament and to the Government. The thanks of the whole trade are due to the executive of this Association, to the members of the trade in Scotland who subscribed so liberally to its funds, to the London and Manchester Defence Associations for their invaluable aid, to William Graham, Esq., M.P., for taking charge of the petition in the House of Commons, and to the other members of Parliament who exercised what influence they could with Government in inducing them to withdraw the obnoxious Bill. We sincerely hope that compulsory regulations for the *storing* of poisons are among the things of the past; but should they come up again, our opponents must know that we are ready to fight the battle over again if need be.

In referring to these matters, we have departed from the usual course of giving simply a record of the transactions of the Association; but they are so intimately connected with ourselves as individuals, that we thought it would be out of place not to refer to them on this occasion.

Returning to the business of the session, we have next to refer to the botany class, commenced in the spring of the year, and conducted by Professor Henneday. Twenty-eight members came forward and joined the class; and, so far as they have gone, Mr. Henneday speaks favourably of them. The class will be resumed on the first Monday of November, for preparation for the Science and Art examinations. But, until these examinations come off in May next, we cannot speak confidently of the progress that has been made.

We have no record at present of the numbers connected with the Association who have passed the various examinations of the Pharmaceutical Society in course of the year. We know, however, we are still behind many of the larger towns in England in this respect, but we hope ere long to stand on a par with our brethren of Liverpool and Manchester; and the fact that a large number of employers in and around Glasgow became members of the Pharmaceutical Society in course of the year, and that we have now a representative in the London Council in the person of Mr. Frazer, augurs well for our future prospects.

The dispensing price-list issued by your Association at the beginning of the session has been freely circulated to both town and country members of the trade, and we are glad to notice that very many have adopted both price-mark and prices; but there are still some who have not yet done so, and we would earnestly urge upon them the necessity for helping us in this good work by their example. Our trade-mark, "Mel Boracis," is well known throughout the trade; and there is no reason why every chemist in the kingdom should not adopt it, so that a universal price-mark and prices might be the rule.

We have to acknowledge the receipt weekly of the *Pharmaceutical Journal*, also the *Chicago Pharmacist* and the *Chemists and Druggists' Advocate;* and the best thanks of the Association are due to the proprietors of these journals. They are open to any member of the Association who may wish a perusal of them, by applying to the Secretary.

We have also to acknowledge the receipt of the book of autograph prescriptions prepared by Mr. Joseph Ince, of London, for your Association; and your Council recommend that a special vote of thanks be awarded that gentleman for his courtesy and kindness to us of late.

The delegates from your Association which attended the British Pharmaceutical Conference meeting at Edinburgh report a successful meeting, and your Council wish all success to the Conference.

As regards the prospects for the ensuing session, they are very bright indeed. The commencement of a chemistry and a materia medica class may be announced shortly; and it is hoped that the members will support and encourage this educational movement by every means in their power. The changing of the Treasurer in course of the session was a source of grief to your Council, but it is hoped that you will select gentlemen for the various offices in future who are likely to keep office for at least one full session. It is expected that Mr. Stanford, of the British Seaweed Company, will deliver the opening address; and several members have already offered to read papers. Several discussions will take place on pharmaceutical matters upon which there exists a difference of opinion, and it is hoped that, when the subjects are announced, members will prepare themselves to take part therein. The long business hours in many of the establishments have long been felt a great barrier to any real progress being made, either in educational or other pharmaceutical matters. The Committee appointed in course of the session to endeavour to bring about some improvement in this respect, went heartily to work at first, but through the agitation on the poisons question, and other circumstances over which your Association had no control, no active measure was able to be carried out; one point, however, was elicited in course of the canvass made, viz. that very many employers are most anxious for some reformation in this direction. We want, however, unanimity, and we are sure the excellent example set by the larger places of business in the central part of the city is worthy the serious consideration of all; and let us hope we may yet have the much-desired short-hour movement carried on as a whole, not only in this city, but throughout the whole country.

In conclusion, we would offer a word of advice to the younger members of the Association, and while doing so we would express regret at the fact that, during the session, the papers delivered by members were not so numerous as in some former years of the Society's existence. But when we remember that members have now compulsory examinations before them, which formerly they had not, we can see that they will be apt to think they do very well if they prepare themselves for their respective examinations, without turning their attention much to testing for adulterations, or the best mode of preparing particular preparations. We would respectfully remind you, however, that this is as much part of your education as that of being able to detect unusual doses in prescriptions, or being able to translate a Latin récipe correctly; and further, that our Association meetings are as much a training-school for students in pharmacy as the class-room or the laboratory. We earnestly urge you, therefore, to keep up the interest of our fortnightly meetings by some practical papers, as well as by your attendance. Those who have already begun, we would encourage to persevere; those who have as yet done nothing, we would ask to make a beginning this year. You have advantages which very many of your employers never had. You will certainly find some difficulties to contend with, but success is invariably the reward of perseverance; and though you may not accomplish much at first, bear in mind that great things generally have small beginnings. The largest river in the world, we are told, takes its rise as a mountain spring; the giant oak was once a slender twig. The whole world, we know, is made up of molecules and atoms. Then let each of us perform our part, however humble, nothing daunted: above all, let us be united in our aims for the advancement of our profession; it is a noble cause; and if we work earnestly, there is no doubt but that we shall have our reward."

The financial statement was then submitted as follows:—

RECEIPTS.

	£.	s.	d.
Balance from last year	5	6	1½
Donations of 10s. and upwards	11	14	6
Subscriptions from 136 Members	9	15	0
Botany Class, Fees, Books, etc.	10	8	6
Soiree Accounts	44	14	6
Total	£81	18	7½

EXPENDITURE.

	£.	s.	d.
Hall Rents for Meetings, etc	9	17	6
Printing Account	9	19	6
Postages, etc.	2	4	3
Botany Class	11	11	3
Soiree Accounts	43	8	0
Balance on hand	4	18	1½
Total	£81	18	7½

Audited and found correct, showing a balance of £4. 18s. 1½d. in Treasurer's hands.

(Signed) JOHN FENWICK, W. S. GALBRAITH. } *Auditors.*

Glasgow, October 4th, 1871.

After some questions had been asked and answered by the Secretary, Mr. JOHN BLACK moved the adoption of the reports, which was seconded by Mr. WILLIAM WHYTE, and unanimously agreed to.

The following gentlemen were elected officers for the ensuing year:—viz. Mr. T. Davison, President; Mr. R. Brodie, Vice-President; Mr. William Young, Treasurer; Mr. J. M. Fairlie, Secretary. Council—Messrs. D. Frazer, J. Jaap, Alexander Kinninmont, John Black, William Whyte, A. E. Johnstone, John Fenwick, A. Paterson, J. Clark, A. Gardner, J. L. M'Millan and Dr. R. Carter Moffat. Auditors—Messrs. John M'Millan and R. T. Dun.

It was afterwards agreed that the annual general meetings be held in April of each year in future, instead of October as hitherto. The Secretary was instructed to convey to the Glasgow Apothecaries' Company and Mr. Joseph Ince, London, the best thanks of the Association for their donations.

Motions were then tabled for next business meeting; first, to alter the name "Glasgow Chemists and Druggists' Association" to that of "Glasgow Pharmaceutical Association;" second, "that the Council be instructed to make application for a grant of money to the Council of the Pharmaceutical Society at London for this Association." Remarks were then made by the Chairman, Messrs. Kinninmont, Paterson and others, and the meeting separated.

THE MIDLAND COUNTIES CHEMISTS' ASSOCIATION, BIRMINGHAM.

On Wednesday evening, the 4th of October, a meeting was held in the rooms of this Association (24, Quadrant, Birmingham) of the chemists' assistants and apprentices of Birmingham. Two hundred invitations were issued by the President, Mr. George Dymond, who also provided coffee and refreshments. The object of the meeting was to draw the attention of young men to the scheme which the Council of the Association had matured for a series of classes and lectures specially adapted to pharmaceutical students in connection with the Birmingham and Midland Institute; the "School Committee" of the Institute having generously placed their educational appliances at the disposal of the Association for this purpose.

About seventy young men responded to the invitation, and the proceedings were characterized by considerable enthusiasm and interest. The programme of lectures, etc., published in last week's PHARMACEUTICAL JOURNAL, was unanimously approved and accepted, and thirty gentlemen at once gave in their names as candidates for one or more of the courses. Committees were also appointed to canvass the assistants and apprentices of the town and neighbourhood, and to urge upon employers the duty of closing their establishments in time to liberate their *employés* to attend these lectures. The lecture season, thus vigorously commenced, will, it is hoped, prove a successful renewal of pharmaceutical life in this metropolis of the Midland Counties, where great facilities exist for study, and for the qualification of young chemists.

On Friday, the 6th of October, the usual monthly meeting of the Council of the Association was held, the President in the chair. At this meeting it was determined to hold a conversazione during the winter months in Birmingham. Due notice will be published as soon as the arrangements are complete, and tickets issued, which will admit a gentleman and lady. A large attendance is anticipated from Birmingham and the Midland Counties; and it is hoped that visitors from more distant places will also be present.

MANCHESTER CHEMISTS AND DRUGGISTS' ASSISTANTS' ASSOCIATION.

A General Meeting was held in the Council-room, Mitre Chambers, on Thursday evening, October 5th; the President (Mr. W. LANE) in the chair.

In commencing the business of the evening, the PRESIDENT, after referring to the success of last session, urged each member, individually, to do his utmost to prevent this being less interesting than its predecessor. He also drew attention to the advantages afforded by the Owens College classes in connection with this Association, viz. chemistry, botany, pharmacy, etc.

The Secretary (Mr. CLARKE) then read the rules, with several alterations suggested by the Committee, which were afterwards passed as read; the principal rearrangement being, that the meetings be held on alternate Tuesday evenings instead of weekly as heretofore.

Several new members were elected, and the first ordinary meeting arranged for Tuesday, October 17th.

HULL CHEMISTS' ASSOCIATION.

The Committee of the Hull Chemists' Association announce that the third winter course of twenty-six lectures, comprising elementary chemistry, materia medica, pharmacy, translation and rendering of prescriptions, etc. will be delivered by W. A. Rudd, Esq., M.R.C.S., in the Society's Room, Albion Street, on Thursday evening, October 26th, at 8.15 precisely, and continuing weekly at the same place and hour. Fee for the course, £1. 1s. Intending students are requested to send in their names as early as convenient to Mr. James Baynes, President, or Mr. Charles B. Bell, Honorary Secretary, who will furnish further information if required.

The course of instruction will have special reference to the requirements of the Minor examination of the

Pharmaceutical Society, which it is now incumbent on all chemists and druggists to pass before commencing or taking charge of a business.

The Committee state that a year ago they expressed a hope that important advantages might eventuate, to efficiently conducted local associations, from the deliberations of the Sub-Committee of the Council of the Pharmaceutical Society on technical education; they regret, however, that as yet no satisfactory result appears to have been arrived at, arising probably from the distracted state of the Society and the trade during the recent agitation.

The following extracts from the reports of the lecturers will be read with interest, as marking the progress of the local Association.

Mr. Rudd, speaking of the materia medica, chemistry and pharmacy class, says, "It affords me much pleasure to be able to state that the class is eminently successful. In the first year we had 18 students, and last session 20, the average attendance being 16. With few exceptions the conduct and attention of the class was commendable. At the examination for prizes, the replies of the candidates and the excellent character of most of their papers, plainly evinced that the gentlemen who took the prizes were desirous of attaining a knowledge of the subjects taught, and had been attentive and *industrious* students, and so in accordance with the maxim '*Qui palmam meruit, ferat*,' the prizes which they had honourably won had been awarded to them. I believe most of these prizemen would pass the Minor examination at once. In the first session four prizes were offered for competition, this year (under special circumstances) six were awarded as follows:—

"Senior materia medica, Mr. Bell, presented by Mr. C. P. Gibson; ditto, second prize, Mr. Sharrah, by Mr. A. Smith; junior materia medica, Mr. Hindson, by Mr. C. B. Bell; senior chemistry, Mr. Holroyd, by Mr. J. Baynes; junior chemistry, Mr. Thompson, by Mr. Rudd; perseverance, Mr. Pearson, by Messrs. F. Earle and J. Baynes.

"Mr. Bell obtained the highest number of marks in both chemistry and materia medica, and his written paper was of the highest order. It is to be regretted that a greater number of the class did not compete; and I would urge masters and employers to encourage those about them, who have given any attention to their studies, to enter for the examinations, because if they are not successful, the competitors gain an idea as to the kind of questions they may expect hereafter, and moreover become initiated into the style and manner of writing papers from memory. I am glad to report that our class-room is now large and convenient; we are gradually getting a supply of useful apparatus, charts, etc., and by adding from time to time other specimens, preparations and chemical instruments, we shall ultimately obtain a good museum of materia medica, and a useful laboratory; and thus be enabled to offer to students in the trade a practical course of instruction in all they need for their examinations, and this in the form of an agreeable and interesting meeting once a week."

Mr. Niven, curator, Hull Botanic Gardens, reports of his class, "The attendance has been much more regular than in the previous session, and the attention displayed by the young men has been of the most satisfactory character; out of the 18 students only on one occasion was the attendance as low in number as 12. The examination was held Sept. 1st, when four of the senior and seven of the junior pupils presented themselves. Mr. Bousfield obtained the senior prize, Mr. T. W. Robinson being nearly equal in number of marks. The junior prize was awarded to Mr. W. H. Lambert, with nearly double the number of marks as compared with the others. On the whole, the result of the examination, both as regards the number attending and the knowledge manifested by the replies given, was a great improvement on that which took place at the close of the previous session. The prizes awarded were,

"Senior botany, Mr. W. Bousfield, Bentley's Manual, presented by Mr. G. Myers; junior botany, Mr. W. H. Lambert, Bentley's Manual, by Mr. A. Pickering."

At the close of the present session it is intended to offer four prizes for competition, viz. senior and junior materia medica and pharmacy, and senior and junior chemistry.

Proceedings of Scientific Societies.

AMERICAN PHARMACEUTICAL ASSOCIATION.

The Nineteenth Annual Meeting of the American Pharmaceutical Association was opened on Wednesday, September 12th, at St. Louis (Missouri), in the hall of the Polytechnic building, corner of Chestnut and Seventh Streets.

The Convention was called to order about half-past three o'clock by the Secretary, Mr. John M. Maisch, who stated that in the absence of the President, first and second Vice-Presidents, and the death of the third Vice-President, it was necessary to elect a President *pro tem.* J. Farris Moore, of Baltimore, Maryland, was unanimously elected.

The list of delegates was then called, and the Committee on Credentials made their report.

Objections were made to the credentials of the Michigan University delegates being accepted, on the ground that the university was not a school of pharmacy. Its rule of graduation is different from that of other pharmaceutical colleges, as it bestows upon the student his certificate of graduation before he has served an actual apprenticeship in the practical department, thus giving him the title of "Pharmaceutical Chemist" while he has only a theoretical knowledge of the business.

The matter was referred to a committee of representatives present, one being selected from each college.

The retiring President congratulated the Association on its prosperity and the increase in the number of members since its foundation. He said the liabilities of the Association were now being paid off, and in another year they would be entirely extinguished. He recommended that a delegate should be sent to the Pharmaceutical Congress which is to be held at St. Petersburg in 1872, as he thought the information to be gained would fully compensate them for the expense.

In the evening the visitors were entertained at the Southern Hotel by the committee of St. Louis druggists.

A large hall in the building where the Conference met was fitted up for the exhibition of various objects of interest to pharmaceutists.

Parliamentary and Law Proceedings.

Suicide by Arsenic.

On October 7th, Mr. Booth, coroner, held an inquiry at Hanley as to the death of Mr. Clement Wooldridge, builder and brick manufacturer, who died on the previous day from the effects of arsenic, self-administered.

Miss Lavinia Wooldridge, deceased's sister, said her brother had been unwell for five or six months, and for several days had been peculiar, having a strange look in his eyes, and talking queerly. She had never heard him threaten to destroy himself, but for some days he did not seem to know what he was about. On Friday morning she found he had been sick, and, noticing a bluish colour in the vomit, asked him what was the matter, to which he replied "bile." Not being satisfied, she went for Mr. Folker, surgeon, who came in about half an hour. Deceased was sick again about two hours after, and continued so nearly the rest of the day. He talked wildly when spoken to. She saw a paper in the room, labelled "poison," but with nothing in it. She had no idea what he could have required poison for. They had dogs and rats, and deceased said two or three weeks ago that one of the dogs (a black one) would have to be poisoned. It had not been poisoned.

Mr. E. Parkes, chemist and druggist, Piccadilly, said deceased came to his shop on Wednesday, and said he wanted a little arsenic to poison a dog. Witness told him he must bring a witness to the sale, or he could not let him have it, though he knew him well, for the law must be complied with. He went out and returned with Mr. Kelsall, ginger-beer manufacturer, and witness then sold him an ounce of arsenic mixed; that is, equal parts of pure arsenic and a colouring powder. The purchase was entered in a book and signed by deceased and Mr. Kelsall. Mr. Wooldridge was not at all excited, and stood chatting with witness a few minutes after making the purchase.

Mr. W. W. Kelsall said he met the deceased on Wednesday about one o'clock. Mr. Wooldridge asked him to go to the Smithfield Inn and have a glass of beer, and he consented. On the way deceased went into Mr. Parke's shop, and presently came to the door and called to witness, to whom he said, "I want you to sign a book. I am going to poison a dog, and it requires some signing." Deceased had a very savage vicious dog, which had been sent him from Wolverhampton. Witness signed the book, and then they went to the Smithfield, where witness stayed till seven o'clock with deceased, whom he left there. Deceased was sober and was perfectly calm.

Mr. W. H. Folker, surgeon, said when he went to the house of deceased on Thursday morning his sister told him deceased had taken poison, and, looking round the room, he saw a paper with a "poison" label upon it, and a half-pint mug, which had a bluish sediment in it. He asked deceased if he had taken poison, and he replied, "Yes." Witness at once prepared an antidote, and asked the deceased to drink it immediately. He asked what it was for, and when told, said, "I will not take that or anything else, and if I get well I will take some more" (poison). He added, "I expected they would send for you, but I hoped I should have 'pegged out' before you came." The poison had begun to work before witness arrived, although deceased vomited again while he was there. He visited him again three or four times during the day, and administered several things, which deceased took in the hope of being relieved of the very great pain he suffered. It was impossible to save him after such a dose of poison. He had swallowed it two hours before witness saw him. Less than a hundredth part of the quantity of arsenic he took would kill a man. He had known deceased for some time, and he should never have suspected him of doing such a thing, but his manner and language when with him on Thursday, his saying he had taken poison and meant it, and if that did not answer he would take more, coupled with the taking of the poison, led witness to the conclusion that he was then not sane.

Mr. D. Groom, managing clerk to Messrs. Tennant, solicitors, said he had seen a great deal of Mr. Wooldridge during the last fortnight. On Wednesday fortnight he came to the office, and said he was glad witness had come back from his holiday, as he had been in trouble for a long time and was almost mad; he had neither been able to eat nor sleep for a long time. He came afterwards every day, sometimes twice a day, and when he came the second time he would ask again the question which had been answered in the morning, having apparently forgotten everything he had been told two or three hours before. About the middle of the previous week he came to the office and cried bitterly for an hour and a half. He continually complained of not being able to think of anything, to attend to his business, or to sleep, and said unless some disputes were arranged it would kill him.

The coroner having summed up and put tho issue before the jury, they found, after a few minutes' consideration, a verdict of "Temporary insanity."—*Staffordshire Weekly Times.*

Alleged Poisoning of a Child.

On Friday night, October 6, Mr. Richards resumed an inquiry at the Prince of Wales Tavern, Banner Street, St. Luke's, into the circumstances attending the death of William Jackford, aged nine months, the infant child of a woman living at 13, Baltic Street, whose death is alleged to have been caused by lead poison, administered by a woman with whom the child had been farmed. When the deceased was six weeks old it was farmed with a Mrs. Elizabeth Peck, who received 7*s.* a week (latterly reduced to 5*s.*) for its keep. This woman kept deceased until the 27th ult., on which day she took it back to the mother in a perfect state of health, according to her account. From the time the child was taken home it began to sicken, and vomited violently all the next day, dying in a fit of convulsions on Thursday night. Dr. Thomas Warder had made a *post-mortem* examination of the body, and found the stomach red and inflamed, with black specks all over it. These specks he had ascertained were lead, and he was, therefore, of opinion that the convulsions had been caused by lead-poisoning. He had kept the contents of the stomach for a chemical analysis, which he thought ought to be made, and the inquiry was adjourned for a week to enable a professor to make the necessary experiments.—*Daily News.*

Poisoning by Carbolic Acid.

An inquest was held on Tuesday last at Bangor to inquire into the death of a young woman named Jones. It appeared from the evidence that on the previous Saturday the deceased went to Mr. Baker, chemist, of Upper Bangor, and asked for two-pennyworth of carbolic acid for the purpose of cleansing a dress of some tar. Mr. Baker expressed his doubt whether the acid would not burn the material, but she wished, she said, to try it, and after informing her of its poisonous property, he supplied her with two drachms of the acid, placing a "poison" label upon the bottle, although, as he explained in answer to some remarks made by the coroner, carbolic acid is not included in the schedule of poisons necessary to be labelled. It is surmised that while walking home she tore the label off the bottle, pieces of it being afterwards discovered in her pocket. When or how she took the poison is not known, but she died in a very short time after coming back. A surgeon (Dr. Humphreys) was sent for, but he did not arrive while she was alive, and observing no appearance of anything unnatural, he attributed death to some ordinary cause. Subsequently, however, another surgeon, Dr. O. T. Williams, saw the body at the request of Mr. Baker, and then the bottle was discovered in the pocket of the deceased's dress. Neither of the medical men could say that death was occasioned by poisoning, the mouth being entirely free from the blistering that would be expected, and a *post-mortem* examination was therefore ordered by the jury. This revealed that the deceased had undoubtedly taken the carbolic acid, the stomach being greatly congested and corroded; but the doctors were of opinion that deceased died from suffocation caused by the closing of the glottis, which would account for the suddenness. The coroner was disposed to cast some reflection upon Mr. Baker for indiscretion, but the jury, in returning a verdict of "Temporary insanity," completely exonerated him from blame.—*Liverpool Mercury.*

Murder and Attempted Suicide by Poisoning.

A sad case of murder and attempted suicide of the murderer is reported. The Rev. T. Selby Watson, M.A., for twenty-five years head master of the Stockwell Proprietary Grammar School, having, according to his own account, killed his wife in a fit of fury, appears to have determined to poison himself by prussic acid. At the first chemist's shop at which he applied the drug was refused, although he was well known; but he was afterwards found weak and speechless, apparently suffering from the effects of poison. Medical assistance was procured and he recovered. A small bottle containing a very diluted mixture, but in which there were clear traces of prussic acid, was found on a chair by his bedside.

On Thursday Mr. Watson was brought before Mr. Ellison, at the Lambeth Police Court, charged with wilfully murdering his wife. Evidence was given that the prisoner was found in an unconscious state by a servant in his employ.

Dr. Rugg said that on Wednesday morning he was called to the prisoner's house, where he found him unconscious, slightly convulsed, breathing heavily and with difficulty. His eyes were fixed and turned upwards, pulse soft and compressible, and there was a cold, clammy perspiration. When he became conscious, prisoner told witness that he had taken prussic acid. Witness described the state in which the wife was found, and after some further evidence the case was adjourned for a week, to allow of a *post-mortem* examination.

Poisoning by an Overdose of Morphia.

An inquest was held on Tuesday last at Southampton upon the body of Solomon Norman, aged 56, a cabinet maker.

Dr. Scott said that on the previous Saturday he was called to see the deceased, whom he found completely insensible and breathing only at intervals. The pupils of the eyes were strongly contracted. Every effort to rouse him was unavailing. Witness believed that deceased had been in the habit of taking morphia or laudanum occasionally, and that his health was not very good. He had observed a 2-oz. bottle and cup on a chair near the bed, and in the bottle was a drop of clear liquid, like water, which had a bitter taste. It was labelled "Diarrhœa mixture," in deceased's own handwriting. He had no doubt, from what he observed, that the deceased had taken a large dose of morphia.

The coroner observed that the evidence already given left no doubt on his mind that the deceased had died from morphia.

Mr. James, one of the jury, stated that he knew the deceased personally. He was very much afflicted, as was shown by his features, and occasionally suffered great pain. Witness was under the impression that he took morphia or some other narcotic to assuage pain, and thought that he probably took an overdose without any other intention than to produce sleep and relieve the pain.

The jury returned a verdict that deceased died from taking accidentally an overdose of morphia.

Review.

Die Pflanzenstoffe: in chemischer, physiologischer pharmakologischer und toxicologischer Hinsicht. Für Aerzte, Apotheker, Chemiker und Pharmakologen bearbeitet. Von Dr. Aug. Husemann und Dr. Th. Husemann. Berlin. 1871.

The publication of this work, which has extended over a period of eighteen months, being now completed, we may briefly sum up the contents and mode of treatment of what will undoubtedly be in future the work of reference on all matters connected with the products of the vegetable kingdom employed in pharmacy. These products the MM. Husemann classify as follows:—A. Simple combinations: (1) bases on alkaloids; (2) acids, both those of general distribution, and those of special occurrence; (3) neutral substances, with the same distinction. B. Compound substances: (1) volatile oils; (2) resins; (3) fats. In each section the substances are arranged under the Natural Orders to which the plants producing them belong; and the authors enter, with more or less of detail, into an account of their discovery, mode of preparation, properties, composition, products of decomposition, behaviour with various reagents, and their physiological and toxicological effects. Of the sections named above, the alkaloids occupy by far the largest space, the immense importance of these bodies to physicians and pharmaceutists, for whose use the work is especially designed, justifying the greater minuteness with which the authors have entered into the details respecting them. Very few substances indeed, of this nature, found in the vegetable kingdom, have not been the subject of investigations leading to practical results for medical science. Those substances, on the other hand, which, although occurring in the vegetable kingdom, are yet much more frequently obtained from animals, or from inorganic materials, are not treated with the same detail. This is especially the case with the so-called fatty acids, as stearic, and in particular with acetic acid, a full account of which would not be looked for in a treatise on vegetable drugs. A difficulty was presented by the arrangement described above, in the case of those substances which occur in more than one family of plants. The alkaloids are in each case described under that order where they are met with most abundantly, or under that in which they were first discovered. With acids and neutral substances this plan could not be followed, and a certain number, as cellulose, starch, and glucose, are classified as bodies of general distribution, while others are discussed under one particular order, to which they more properly belong, with references from others where they also occur. Inulin, for instance, is placed under *Compositæ* (Synantheren), the authors considering that the older view of Mulder, that this substance is generally distributed, has been disposed of by the more recent investigations of Dragendorff and Prantl, and that, with the exception of *Campanula rapunculoides*, it is found nowhere except in the above-named family. Inosite again, though discovered by Marmé in several families, is yet placed under *Papilionaceæ*, from having been first found in *Phaseolus vulgaris*. Caproic and capric acids, on the other hand, are placed among the generally distributed substances, although at present found in only single families, from the strong probability that further researches will lead to their discovery in many others also. Pelasgonic, myristic, and lauric acids are considered as belonging properly to the orders of plants from which they respectively take their names. Avenin and conglutin are treated as dependants of legumin, with which they are apparently identical. The work being intended as a repertorium of facts rather than as an introduction to theories, the so-called rational formulæ of the substances are avoided in the headings, and are only referred to when treating of the composition of the more important. In by far the majority of instances, nothing but the empirical formula is given. The authors consider that as the real constitution of such well-known substances as alcohol, ether, and acetic acid, is still the subject of so much controversy, it is desirable, in a work of this kind, not to enter on so debatable a field in the case of the far more complicated compounds of which the work mainly treats. The sketch we have given will show that Husemann's 'Pflanzenstoffe' is indispenable to all who wish to make themselves acquainted with the most recent investigations in the regions of materia medica.

Obituary.

JOHN SAVORY, ESQ.

We regret to have to record the death on the 3rd instant of a gentleman who took an active part in the formation of the Pharmaceutical Society of Great Britain, and whose name stands third on the list of its presidents.

Mr. John Savory, born in 1800, was early apprenticed to his uncle as an apothecary. After a residence in Paris, where he studied pharmacy, and practised the then new art of cupping (which he had previously acquired under the celebrated Mr. Minors), he passed the examination of the Society of Apothecaries, but relinquishing any idea of practising, he became a partner in the firm of Savory and Moore. Mr. Savory was associated with Messrs. Wm. Allen, Jacob Bell, Morson, Payne, and other well-known pharmaceutists, in the foundation of the Pharmaceutical Society. For many years he took a very active part in its affairs, holding the office of president from the years 1844 to 1848 inclusive. Upon the passing of the Pharmacy Act, in 1852, he was compelled, as a member of the Society of Apothecaries, to break off this long connection, but he always retained a lively interest in the Society's welfare. He was a great advocate for the passing of the law making examination compulsory on all who engaged in the business of a chemist and druggist, believing it would tend to raise them to a higher social position.

Mr. Savory was a business man of the old school. Always active and industrious himself, he insisted that all that was done by those in his employ should be done well. He was fond of relating his own youthful experiences of assistants' life, and comparing them with the more luxurious manners and customs of modern days, not always to the advantage of those of the present day.

He had for the last three or four years retired from any very active part in the business with which he had been so long and honourably connected. Until latterly he was a hale man, but within the last twelvemonth a disease of an insidious character crept on him, and he gradually sank and died at Frant, in Sussex, in the 72nd year of his age.

In 1842, Mr. Savory read a paper on the Preparation of Syrups and Oxymels at an evening meeting of the Pharmaceutical Society, and he also furnished communications to this Journal on Extractum Cannabis Indicæ, Kousso, etc.

BOOKS RECEIVED.

THE SKIM-MILK TREATMENT OF DIABETES AND BRIGHT'S DISEASE, with Clinical Observations on the Symptoms and Pathology of these Affections. By ARTHUR SCOTT DONKIN, M.D. London: Longmans. 1871. From the Publishers.

TRANSACTIONS OF THE CLINICAL SOCIETY OF LONDON. Vol. IV. London: Longmans. 1871. From the Society.

The following journals have been received:—The 'British Medical Journal,' Oct. 7; the 'Medical Times and Gazette,' Oct. 7; the 'Lancet,' Oct. 7; the 'Medical Press and Circular,' Oct. 11; 'Nature,' Oct. 5; the 'Chemical News,' Oct. 7; 'English Mechanic,' Oct. 6; 'Gardeners' Chronicle,' Oct. 7; the 'Grocer,' Oct. 7; the 'Journal of the Society of Arts,' Oct. 7; the 'Brewers' Guardian,' Oct. 1; the 'Practitioner' for October; 'Mid-weekly Hampshire Independent,' Oct. 11.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. J. H. Wilson, Mr. Bienvenu, Mr. D. B. Hanbury, Mr. J. Robbins, Mr. Griffith, Mr. H. Deane, J. C. K., W. B., T. B., "Sigma."

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

THE CHIPPENHAM CASE.

Sir,—After the "withering" remarks of Dr. Fox upon my letter, published in your Journal a fortnight since, in reference to the above case, allow me, in justice to myself, to say how gratified I feel at so eminent an authority as Dr. Squire boldly and ably coming forward to endorse my views as to the "terrible" strength of the "solution," about which much correspondence has taken place. In my opinion, Dr. Squire deserves the thanks of our profession for the candid acknowledgment he makes of the necessity for our supervision of all prescriptions entrusted to us. This at once negatives Dr. Fox's "usurping" theory, upon which many "eminent" in the medical profession have a habit of venting their indignation unjustly.

October 9th, 1871. M. P. S.

Sir,—One final word on the subject of bichloride of mercury in ringworm. Your correspondent "*Thirty Years M. P. S.*" must forgive me for saying that his remarks are wholly irrelevant. He introduces an entirely new matter when he discusses the propriety of a pharmaceutist taking steps to rectify mistakes in prescriptions, and talks about internal remedies. I can only say that I shall be very much obliged to any pharmaceutist who may save me from the consequences of an oversight or inadvertence in any of my written prescriptions. I entirely repudiate holding the doctrine that a chemist is "to *dispense* but not *opine*." The real point involved, however, in the Chippenham case is the use of a *local* remedy which *is never written* in prescriptions, but is used only *by the medical man himself*. I never wrote a prescription, as far as I know, for the remedy; never certainly gave it to a patient, and no patient of mine ever took it to a chemist to be compounded. The remedy is used by the practitioner himself, and he alone; and therefore I naturally felt indignant at "*M. P. S.*" in his telling me that no chemist's assistant of six months' standing would dream of using a remedy so "outrageously strong," and so on, which was as much as saying that Dr. Meeres was either criminally reckless or utterly ignorant. But why, Sir, do your correspondents call the bichloride remedy in question a *lotion?* I have classed it in my work with "*vesicating parasiticides,*" in a separate group, distinct from "*milder parasiticides for ordinary use,*" with the very purpose of preventing it being considered "a lotion" or a simple application.

Again, your correspondents seem to be entirely unaware of the fact, that the very object of using so strong a solution of bichloride is to prevent absorption by inducing rapid and free coagulation of the albuminous fluids of the skin, by quickly *tanning* the skin in fact. TILBURY FOX.

PROVINCIAL EDUCATION.

Sir,—May I ask you to give publicity to the following announcement, extracted from the official statement of "Results of the Examinations of Science Schools and Classes, May, 1871"?—

"LIST OF QUEEN'S MEDALLISTS.

Subject—Vegetable Anatomy and Physiology.

Name.	Age.	Occupation.	School.	Teacher.	Medal.
Arthur N. Little .	16	Chemist	Bristol .	Leipner, A. .	Gold Medal.
Charles H. Cuming.	22	Chemist	Plymouth	Balkwill, F. P.	Silver Medal.
Subject—Systematic and Economic Botany.					
Arthur Northcroft	18	Chemist	Plymouth	Balkwill, F. P.	Silver Medal.
Subject—Animal Physiology.					
William Davis . .	17	Chemist	Torquay .	Viccars, T. . .	Silver Medal."

In order that your readers may correctly estimate the honours gained by these gentlemen, I may state that the competition for these medals is amongst the Science Class-students of the whole kingdom, and that although many prizes of books are distributed at these examinations, medals only to the number of one gold, one silver and two bronze in each subject are offered.

It can scarcely be necessary to point with any more elaboration to the advantage to provincial schools of pharmacy of alliance with the science class system. G. F. SCHACHT.

Clifton, October 7th, 1871.

DESGOFFE'S PATENT HYDRAULIC PRESSES.

Sir,—Will you permit us to point out a typographical error in the description of our "Desgoffe's patent hydraulic press," which appeared in the notes of the meeting of the Pharmaceutical Society (PHARMACEUTICAL JOURNAL, October 7, 1871). The smaller ram of the press is described as $13\frac{1}{4}$ inches in diameter, instead of $1\frac{3}{4}$ inches. It will be evident the power of the press depends on the lower ram, which is forced into the chamber, being smaller than the main ram which is forced out, the force being in proportion to the relative areas of these rams.

This leads us to mention another and much more important error, for which, we regret to say, the circulars distributed by ourselves at the meeting are responsible. By some mistake the power of the press has been there stated as 6 tons; whereas it will be easily seen that a pressure of three times that figure may easily be obtained; as below.

The circumference of the circle described by the handles = 50 inches. The thread of the screw, which forces the smaller ram inwards, is 5 to the inch.

The force with which the smaller ram is forced inwards is, therefore, $50 \times 5 = 250$ times the power applied to the lever.

Owing to the difference between the areas of the two rams being rather more than 4 : 1, this power will be rather more than quadrupled in its transmission to the work; making it equal to fully 1000 times that which is applied to the lever.

Now for such work as this, which is intermittent, and so arranged that a man can put out all his strength in one effort at the end of the pressure, we may reckon that the pressure applied to the lever will not be less than 50 lb.

Multiply 50 lb. × 1000
= 50,000 lb. = over 22 tons.

From this figure a certain amount must of course be deducted for friction; but the net result will show that this little press, in spite of its very low price, will accomplish all and more than all that will be required for extracting tinctures.

We believe, therefore, that this machine answers all the objections brought forward by Mr. Umney in his letter on page 290 of the same number of your Journal, as to the "too large" size, "excessive cost," and altogether "extra outlay" required for the adoption of hydraulic instead of simple screw pressure.

HAYWARD TYLER AND CO.

IMPROVED TINCTURE PRESS.

Sir,—I regret that the letter of *S. D.*, of Bow (PHARM. JOURN., September 16) has escaped my notice. With an apology for my neglect, I now reply to his queries.

1. If he will refer to my paper, he will find, the press described as being light and portable. There is no difficulty in raising it, cylinder and all, and pouring off the tincture from time to time into any suitable vessel or the filtering-funnel, the basin being spouted for the purpose.

2. The cylinder could be made by any tin-plate worker; if for a small press I think strong block-tin would do; but it should be joined by rivets, solder not being strong enough.

I cannot agree with Mr. Umney that the position in which the press is worked is unfavourable for muscular force, or that it should be compared either to pulling an oar or working a crank; for as both these labours are continuous, the person would soon become exhausted if he applied his full strength. Now, turning the screw of a press is very different; the labour being at short intervals, and the two arms of the lever grasped by each hand in opposition to the other, in my opinion, is rather favourable to the development of muscular power, although inferior to what it might be if the press were fixed and the lever vertical; in this position the power could be applied with greater ease, but would never exceed the actual weight of the individual. Now we know that many a person has strength enough to raise a weight much greater than his own body, so I think that my estimate of 100 lb.* represents a fair average of the force applied towards the end of the process, and that Mr. Umney greatly underrates it. As for my total estimate of the pressure obtained, as I before stated, it is somewhat theoretical, practically it is much less, a large deduction having to be allowed for counteracting influences, especially friction; hence the importance of any attempt to diminish this item, as in my press, the screws being but half an inch in diameter, and the pitch (or threads) only one-eighth, and these might be further reduced with advantage. I am pleased to find this important subject "ventilated," as it is the fashion to term it, but I did not write the paper for the purpose of raising an unprofitable discussion on the theoretical power of the screw-press, but rather in the hope of pointing how it might be improved. With this object I have endeavoured to utilize, what Mr. Umney with courteous sarcasm is pleased to designate, my "engineering skill," the result being the production of an implement which for its simplicity, convenience, and economy surpasses in efficiency anything I have yet seen.

I shall be happy to give any further information or answer queries either through your columns or direct, should any of your correspondents desire it. C. A. STAPLES.

THE DRUG TRADE IN CANADA.

Sir,—Allow me to answer the inquiries of your correspondent "Jateorrhiza" respecting the drug trade in Canada.

As to assistants, there is not any demand for their services beyond what the country can supply, and they are paid about the same as here in England. In Hamilton I received at the rate of 400 dollars per annum, out of which I paid four dollars a week for board and lodging (the dollar being equal to 4*s.* 2*d.* English).

The towns are well supplied with druggists, and I am of opinion that there is not any chance for a new-comer; but I was informed that there were chances for opening drug-stores in many of the rising villages in the Ontario district.

As the Canadian druggists deal in oils, paints, varnishes, and all kinds of paint-brushes, I should recommend a person going out with sufficient capital to start on his own account, to get a few months' experience in a good oil and colour shop in England before starting.

The Pharmacopœias in use were the British and the United States; but, as the Canadian Pharmacy Act has passed recently, there is probably a recognized Pharmacopœia. But perhaps, Sir, you can answer this question, as well as to whether English qualifications are allowed under the Canadian Act, of which I know nothing whatever, as it became law after I left that country.

Respecting the expense of starting a new concern, and the choice of a locality, I should refer "Jateorrhiza" to a respectable wholesale house on the spot for information—Elliott and Co., Toronto, or Wyner and Co., Hamilton.

In conclusion, it must be understood that I do not take upon myself the serious responsibility of advising any man to leave home and friends and start in a foreign land (which advice is too often thoughtlessly given), but only wish to answer inquiries made. W. B.

October 9th, 1871.

"*Scrutator.*"—We would recommend you to apply to some of the wine doctors who are to be found in the neighbourhood of the docks.

A. Shillcock.—We would suggest that you should apply to the persons in whose hands you think the remedy lies, and see what influence they could be brought to exercise.

J. R. Summers.—The matter referred seems to lie somewhat outside strict pharmaceutical practice.

"*Scribo.*"—You will find information as to the preparation of pepsine in PHARM. JOURN. 1st Ser. XVI. 472; 2nd Ser. VII. 112; 3rd Ser. I. 666; and Wood and Bache's 'United States Dispensatory,' 12th edit. p. 1091.

* In 'Practical Pharmacy' (Mohr and Redwood, p. 107) a compound screw-press is described, the *theoretical* power being 960,000 lb. (*i.e. over* 400 *tons!*); the calculation is based on the lever being moved by a force equal to 100 lb. I take this as a moderate estimate of strength, and believe it is often greatly exceeded.—C. A. S.

CHINESE PEPPERMINT OIL.

BY PROFESSOR FLÜCKIGER.

According to a notice contained in the *American Journal of Pharmacy*, May 1871, p. 223,* the Chinese, when suffering with facial neuralgia, use oil of peppermint, which they lightly apply with a camel-hair pencil. This application has now found its way to the opposite shore of the Pacific, where the immigration of Chinese people is very considerable. The American journal, indeed, states that Chinese pharmaceutists in San Francisco, as well as in New York, sell the said remedy for neuralgia, and that it has already gained some repute. The oil for this purpose is put up in small phials containing about half a drachm.

I had the opportunity, some weeks ago, of a conversation with a Swiss merchant, coming from San Francisco, who not only corroborated the above information, but showed me a phial containing the "Chinese medicine," which he had bought there himself in a Chinese pharmaceutical shop. The owner of the phial had frequently used it, and spoke in high terms of the good effects of the oil. The phial contained, I think, even less than half a drachm (price one dollar!), and was labelled, *Fook Chang Yong*, wholesale and retail druggist and chemist, 744, Sacramento Street, Corner Dupont, San Francisco.

I was suspicious enough to suppose the oil to be common peppermint oil of American or English origin, procured perhaps by the Chinese in San Francisco, although the said merchant firmly believed, for good reasons as he thought, it was directly imported from China.

Having pointed out the magnificent fluorescence which nitric acid imparts to peppermint oil,† I found that the above Chinese oil partakes not at all of this reaction; it is not coloured by nitric acid (1·20 sp. gr.), even when gently warmed with it.

A few drops of the oil exposed for some hours only on a glass slide yielded abundantly crystals of a camphor, reminding me in every respect of the solid *Japanese peppermint oil*, which during the past few years has been met with in European trade.

In both the above respects the Chinese peppermint oil is consequently different, at least to most of the specimens of European and American oil at my command, although it has the same agreeable flavour. Does it, that is to say its solid part, which appears to be prevailing, agree with the Japanese drug? I have ascertained that the latter is not altered by the treatment with nitric acid; it may therefore very likely be identical with the crystallizable part of Chinese oil. I have also been informed by the said Swiss gentleman that the "Chinese medicine" in cold weather solidifies even in California.

I should be happy if my fragmentary observations could induce some resident in China or Japan to devote some investigation to the mother-plant of the Eastern oils under notice, and to the production of the latter. Is the solid Japanese oil obtained by means of cooling from a liquid similar to the Chinese oil? Chinese oil is said to be distilled at Canton.‡

As to the former I beg to remind that it has been shown by Oppenheim and by Gorup-Besanez* to agree with the formula $C_{10}H_{18} + H_2O$, and to possess the nature of an alcohol. This so-called *Menthol* appears to be identical with peppermint-camphor, which sometimes in cold separates from peppermint oil; their identity, however, is not quite satisfactorily proved. Camphor obtained from peppermint oil has been analysed by Dumas, by Blanchet and Sell, and also by Walter.† Its percentage composition is the same as that of menthol.

* See PHARM. JOURN. No. 26, 1870, p. 426.

† See PHARM. JOURN., Feb. 1871, p. 682, and Aug. 1871, p. 714; also *American Journ. of Pharm.* 1871, p. 164.

‡ Hanbury, PHARM. JOURN., Sept. 1871, p. 244.

* 'Comptes Rendus,' liii. 379, 483; Journ. Chem. Soc. xv. 24; 'Jahresbericht der Chemie,' von Kopp und Will., 1861, 683.

† Gmelin, Org. Chemistry, viii. 450.

VESICATING INSECTS.

BY M. C. COOKE, M.A.

(*Continued from page 262.*)

SPANISH FLY, *Lytta vesicatoria*, Fabr.; bright glossy brass-green or bluish, glabrous, beneath more glossy with a few hairs; breast densely pubescent, finely punctured; head and thorax with a longitudinal channel; elytra with two slightly raised lines; tarsi violaceous; antennæ black, with the basal joint brassy.—Pereira, Mat. Med. ii. p. 742, f. 117; Steph. Med. Zool. t. 26, f. 2; Brandt and Ratzeb. ii. t. xviii. f. 1–6; Muls. Vesicants, f. 14–18.—Form elongated, almost cylindrical; length 6–11 lines, breadth 1–2 lines; colour brass or copper-green; odour nauseous, unpleasant. Body covered with whitish-grey hairs, which are most numerous on the thorax. Head large, subcordate, with a longitudinal furrow along its top. Eyes lateral, dark brown. Thorax not larger than the head, narrowed at the base. Elytra 4–6 lines long, and from $\frac{3}{4}$–$1\frac{1}{2}$ lines broad; costa slightly margined. Wings ample, thin, membranous, veined, transparent, pale brown; tips folded. Legs stout, 4–6 lines long, the hinder ones longest; tibiæ clavate, in the female all terminated by two small moveable spurs, in the male the two hinder pairs of extremities alone have this arrangement, the anterior ones having but one spur; last joint of the tarsi with a pair of bifid claws. Abdomen soft, broadest in the female. In the female, near the anus, are two articulated caudal appendages (Pereira).

Native of the south of Europe. Found in France, Germany, Hungary, Russia, Siberia and England (rarely) on Oleaceous and Caprifoliaceous plants.

It is unnecessary to enter upon the details of this insect here, since it is included in all works on materia medica, and is the common officinal vesicant of Britain and other European countries.

Lytta Pallasii, Gebl., is very much like the common blistering-fly in colour and in size. It is a native of Siberia, and specimens may be sometimes picked out from amongst "Russian Cantharides." One distinguishing feature is, that the posterior tarsi of *L. Pallasii* are toothed, whilst those of *L. vesicatoria* are not.

L. phalerata, Walt., is a Turkish species closely allied to the foregoing, but, being a hairy insect, it would be easily detected if mixed with cantharides. We are not aware of its having been employed for that purpose; and, if so, it is probably a good vesicant itself, so that its mixture would not be fraudulent to the extent hereafter to be noted, in which case insects entirely inert have been used as adulterants.

Lucerne Blister Fly, *Lytta dubia*, Oliv.; black; head rufous, with a black line; thorax and elytra immaculate, margin of elytra ash-coloured.—Oliv. Ent. iii. t. 1. f. 7. *Cantharis rufidorsum*, Goeze, Ent. Beytr. 1777. *Meloe algiricus*, Sulz. Hist. Ins. t. 7. f. 12.

Found on the Lucerne and other plants in the South of France, Italy, the Levant and Southern Siberia.

About the size of *Lytta vesicatoria*. Antennæ black, filiform. Head rufous, the eyes and a superior longitudinal line black. Thorax black, with a longitudinal impressed line. Elytra flexible, black, with the lateral margin ash-coloured. Body black beneath and subtomentose. Feet black.

This is not the *Lytta dubia* of Fabricius, which is a Siberian insect, although it has been confounded therewith by some writers on vesicants, especially Moquin-Tandon, who cites it as a species employed in the South of France. It is unnecessary, in a communication like the present, to point out the technical distinctions between the two insects, confounded under one specific name. Goeze's name of *L. rufidorsum* is that under which the European species is best known to entomologists.

We are not aware of any other species that is collected in Europe for vesicatory purposes.

Asiatic Cantharides.

Syrian Blister Fly, *Lytta syriaca*, Fabr.; antennæ black; head black; thorax ferruginous, subrotund; elytra smooth, bluish-green; feet black.—Fabr. Sp. i. p. 329; Oliv. Ent. iii. t. i. f. 5. *Alosimus syriacus*, Mulsant, 'Vesicants,' p. 151. *Meloe syriacus*, Linn. Syst. Nat. p. 680.

Pubescent. Head black or greenish-black, ornamented in the middle of the forehead with a punctiform, yellowish-red spot; striped with a medial line on the vertex. Prothorax of a yellowish or testaceous russet, striped with a medial line and marked with a dimple between that line and each of the lateral edges, a little behind half of its length. Elytra of a greenish-blue or bluish-green; under side of the body of a greenish-blue or blackish-blue. Feet black or greenish-black.

Male.—First joint of the intermediate tarsi shorter than the second, hardly any longer than it is broad, compressed, and dilated underneath in an almost equal manner, separated underneath the tibiæ by a deep furrow. Last arch of the belly cut in or split as far as half its length.

Female.—First joint of the intermediate tarsi longer than broad, regular and not dilated. Last ventral arch entire or barely indented.

Moquin-Tandon cites this as an economic species, on the authority of Forskal. It is also quoted by Pereira.

Arabian Blister Fly, *Lytta segetum*, Fabr.—Fabr. Ent. Syst. i. 2. p. 84; Lucas, Expl. Alg. t. 34. f. 3.

Arabia, Sicily, Algeria.

Parallel. Upper side of the body bristling with a very short ash-coloured down; varying from a half golden green or blue to violet or violet-black. Head and prothorax marked with tolerably large and close dots, the former without any traces of a medial line. Antennæ black; first joint green, fourth and tenth joints a little longer than broad. Prothorax enlarged for two-fifths of its length, then parallel; truncated, and with a narrow border at the base, not so long as broad, generally marked with a dimple or furrow. Elytra at least once longer than they are broad together, almost semi-cylindrical. Tarsi blackish, the first joint of the posterior a little shorter than the two following together.

Male.—Last ventral arch cut in as far as one-half its length.

Female.—Last ventral arch entire, or scarcely at all indented.

This insect is also named by Moquin-Tandon as one of those employed as a vesicant.

(*To be continued.*)

THE PURIFICATION OF FATS AND SUETS.

The task that devolved upon the authorities of Paris during the late siege of that city by the Germans, of obtaining food for the many thousands who were cut off by the iron circle of their enemies from their usual sources of supply, was a difficult, and, as the event proved, an impossible one. Towards its accomplishment, however, great efforts were put forth by French *savans*, and for a time the whole current of scientific investigation was turned towards securing increased effectiveness in warlike weapons, the enforcement of the sanitary regulations best suited to the abnormal state of affairs, and the discovery and utilization of previously unknown or unused alimentary substances.

Among the many memoirs presented to the French Academy with the last-mentioned object, were some that treated of a subject not without interest to pharmacists,—the purification of fats and suets,—of which the following is a *résumé*.

M. A. Boillot communicated a method which he stated had yielded excellent results, and for which he claimed the merits of simplicity and moderate cost.* Two litres of lime-water is added to one kilometre of the fat or suet, mixed well together, and kept over the fire two or three hours. It is then left to cool, and, when it has become pasty and acquired a sufficient consistence, it is decanted, placed in flannel or linen, and submitted to an increasing pressure, when water and oleic acid, containing besides some solid fatty acids, from which it can readily be freed afterwards, passes through. The oily mass, after two or three days, acquires a whiteness which leaves nothing to be desired; and when freed from the little lime that it contains by treating it with water slightly acidulated with sulphuric acid, may be used for purposes of illumination. Fat thus prepared loses its bad odour, and acquires a remarkable hardness and whiteness;† and if run into water to which a small quantity of sulphuric or acetic acid, or vinegar, has been added, it will be thoroughly purified, and may be employed for all purposes to which the best fats are applied.

M. Dubrunfaut states‡ that the most tainted fat may be deprived of its characteristic odour by submitting it to the operation of frying; and that, after

* Comptes Rendus, lxxii. 36.

† The use of lime for the purpose of blanching lard has already been reported from America. There, however, it appears to be left as an impurity in the lard. See Pharm. Journ. 1st ser. Vol. I. p. 1043.

‡ Comptes Rendus, lxxii. 37.

being thus treated in a manner specified, it may be used for all culinary preparations, and even for pastry. For this fact he furnishes the following scientific explanation.

M. Dubrunfaut has practically ascertained, by laboratory and manufacturing experiments, that fish oil is radically deprived of its odorous principle by simply heating it to a high temperature (330° C.). He has also found that the fatty acids are volatilized in a current of steam at a temperature above 100° C., whilst the neutral fats remain perfectly fixed. Finally, he has found that the neutral fats comport themselves in a similar manner to the fatty acids under the influence of a current of steam, if they have previously been heated to a temperature of from 300° to 330° C.

The manner in which the purification is effected is by heating the fat in a frying-pan or other suitable utensil to a temperature of about 140° to 150° C., then cautiously sprinkling upon it small quantities of water. The vapour so caused traverses the fat, decomposes the neutral fatty substances,—which, as shown by M. Chevreul in the case of hircine, yield fatty acids,—the whole of the fatty acids are volatilized, and the purification is accomplished. These conditions, he says, unite all the elements which are favourable to the elimination of the volatile fatty acids, which are generally the material cause of the odours of fat substances. The product thus obtained is as perfectly purified as the finest lard.

M. Dubrunfaut had so much faith in the efficacy of this method of purification, that he called attention to the large quantity of candle tallow still in the city, and stated that by a modification of the process to suit the known constituents of the tallow, the whole of it might be so purified as to fit it for use in cooking various kinds of coarse flours, such as buckwheat flour, and thus secured for the purposes of alimentation. The same method might also, he stated, be applied to the large stock of colza oil.

In a second note presented to the Academy,* M. Dubrunfaut again called attention to the facility with which the large stocks of tallow and colza oil might be utilized for food, while the mineral oils would suffice for the purposes of lighting. On this occasion he pointed out the similarity of the origin of the kitchen fats and the tallow of commerce, and said that the absence from the kitchen fats of the repulsive odour of the tallow was due to the method of preparation. In the operation of roasting meat especially the conditions necessary for the purification of the fat—the high temperature and the superheated vapour—were realized in perfection. And although they were present in a less degree in the operation of boiling, still there was a real purification. This opinion is supported by the fact that tainted fat, undergoing ebullition in a melting-pot in the presence of salt water, is purified in proportion as the boiling is prolonged.

As the result of various experiments in which colza oil was treated according to M. Dubrunfaut's method, he reported that the oil lost its characteristic taste and odour, preserving only a slight savour that was not repulsive, and would not prevent its use in culinary operations.

MM. Wurtz and Willm reported† that they had found that when colza oil was submitted to a current of steam at a temperature of from 116° to 120° C., an odorous and acrid principle was carried off without sensibly saponifying the oil,—an inconvenience which followed the employment of steam too highly heated. Washing with a feeble warm solution of carbonate of soda takes away all traces of the fatty acids that may have been formed, or have pre-existed, in oil of bad quality; but the separation of the soap so formed presents some difficulties.*

M. Fua suggested† a modification of M. Dubrunfaut's method, which consisted in melting the fats at so high a temperature that the residue of the cellular and vascular tissues were thoroughly exhausted. He also expressed an opinion that these methods for the purification of fats were preferable to the introduction of either acids, alkalies, or other substances, as these foreign bodies had always to be removed afterwards.

* Comptes Rendus, lxxii. 57. † *Ibid.* lxxii. 57.

DIGITALIS.‡

BY J. MILNER FOTHERGILL, M.D.

The following particulars as to the composition, chemical characteristics, action, etc. of digitalis, are taken from the essay on "Digitalis: its Mode of Action and its Use," by Dr. J. Milner Fothergill, Senior Resident Medical Officer to the Public Dispensary, Leeds, for which that gentleman received the Hastings medal at the recent meeting of the British Medical Association at Plymouth.

Composition.—The leaves of digitalis have been subjected to repeated chemical examination, chiefly by foreign investigators. It has been found that there are various substances, which can be separated from one another, contained in them. The principal of these is digitaline. Indeed, by some it is considered the active principle; but of this Dr. Fothergill is not convinced; certainly it did not act on frogs so powerfully as the tincture of the leaves did. It is, however, frequently used. Digitaline is light yellow, inodorous, and crystallizes with difficulty, presenting the appearance of very imperfect crystals, if crystals at all, under a pretty high magnifying power (× 250). It does not contain nitrogen, nor does it neutralize acids. It is a principle, not an alkaloid. It is soluble in sulphuric acid, and also in hydrochloric acid. The solution in hydrochloric acid passes from yellow to a fine green. Homolle considered this reaction sufficiently delicate for medico-legal purposes. It is scarcely necessary to state that it is not generally accepted as being so. There are also digitalic acid, digitalin, digitalose, digitalide, of whose qualities we know nothing. There are also tannic acid, sugar, and a substance named pectin, chlorophyll and woody fibre.

Chemical Characteristics.—A dark precipitate (tanno-gallate of iron,—Pereira) is formed on the addition of sesquichloride of iron to the decoction, or to a mixture of the tincture and water. A solution of gelatine causes a scanty precipitate (tannate of gelatine). Tincture of

* Some idea of the importance of this subject to the Parisians under then existing circumstances may be inferred from the fact that the stock of colza oil in the reservoirs at Saint-Ouen and La Valette was estimated at from 12,000,000 to 13,000,000 kilograms. This enormous quantity had been accumulated by speculators who, anticipating a great demand for illuminating purposes, had obtained the oil from all the markets of Europe. It was the ordinary colza oil of commerce, prepared by warmth from the seeds of *Brassica Napus*, and had not undergone sulphuric purification which, while rendering it combustible, would have unfitted it for alimentation.

† Comptes Rendus, lxxii. 59.

‡ Abstracted from the Hastings Prize Essay, for 1870, published in the *British Medical Journal*, Nos. 548 to 553.

nut-galls merely causes a slight turbidity. There is no reason to suppose that any of the active principles are affected by these combinations; or that the drug is rendered inert by anything that we know. For a fuller account of its principles, the reader, if curious, can consult Pereira, or the thesis of Brunton.

Action on the Blood.—Magendie and Thackrah thought the addition of a decoction of digitalis interfered with the coagulation of the blood. Davy states that the addition of a large quantity of watery extract to blood gave it the consistence of paste. So far as was known to the author, no English observers have recently noticed anything peculiar in the blood of animals experimented upon. And in the large number of animals experimented on by him, there never was any appearance about the blood which made it different from any other blood. No scientific observations of any kind have yet been instituted as to the action of digitalis or any of its constituents on the blood, such as have been performed by Harley, Bernard, Fraser, and Crum Brown and Broadbent, on some other therapeutic agents, by which their action has been much elucidated.

On Plants.—Marcet and Brunton have separately tried the effects of digitalis on the haricot bean by watering the plant with an infusion, and found it to kill it by withering it up. The writer injected a strong infusion into the hollow stems of the ordinary bean without effect for days; in time, however, those so treated withered and died, contrasting with those not interfered with. Precisely the same results ensued from similar injections into the orange lily. A lettuce was frequently watered, in a dry season too, with a strong solution, without any perceptible injury to it either soon or late. Another was then dug up by the roots, and placed in a large basin containing a strong infusion of foxglove, and for a day or two grew amazingly; on the fourth day, it commenced to wither, and died in a day or two. The first effect of the drug was to improve the appearance of the plants to which it was administered; an impression to the same effect remains in the minds of friends who witnessed the experiments. Strong infusions were injected into the stem of the rasp, and into holes bored into a plum-tree without apparent effect.

On Invertebrata.—Snails, when touched with the tincture or strong infusion, took a contractile spasm, threw off a coating of mucus, and passed on apparently unaffected. Earth-worms, when placed in an infusion for a short time, did not appear incommoded. Wasps were not affected by it when applied to them.

On Fishes.—Minnows, when placed in an infusion of digitalis, a very weak one, for some minutes were not affected; then commenced a rapid movement of the gills, which lasted till death; they were also drawn to one side in dying. After death, the ventricle was found firmly contracted and glistening like a speck of gristle; and, on being examined under the microscope, no cavity was visible. The auricle was distended and vainly tried to drive any blood into the tightly contracted ventricle, the blood merely regurgitating into the venous sinus behind, and then flowing back again, from the venous distension relieving itself on the auricular diastole. On pricking the venous sinus so as to permit the escape of the contaminated blood, the auricle soon also became firmly contracted, and no cavity was perceptible under the microscope. The quickened action of the gills was probably due to the accumulation of carbonic acid in the blood, giving rise to an increased necessity for breathing, while the firmly contracted ventricle prevented the flow of blood to the branchiæ, and cut it off from oxygenation.

On Birds.—About half a drachm of strong infusion of digitalis was passed down the throats of two sparrows, some being spilled during the process. The animals soon became unable to move much, and gasped for breath most vigorously. The hen died first, and the cock died hard in about half an hour. On opening them immediately on death, the left ventricle in each was found firmly contracted; the lungs so congested as almost to be hepatized; the right ventricle full of blood. It was evident that the condition of the lungs and right ventricle was due to inability to drive the blood into the contracted left ventricle. The gorged condition of the lungs accounted for the gasping respiration observed. Side by side with them, ten drops of Fleming's tincture of aconite were administered to a third sparrow, who became convulsed, and died in about one minute and a half. In it, the lungs were pale, and the heart completely paralysed and distended, looking like a small Barcelona nut. The contrast between the two conditions was marked.

On Mammals.—Experiments have been made on the higher animals by Handfield Jones and Fuller, with similar effects as regards the state of the heart after death.

(*To be continued.*)

DISINFECTION.*

No. III.

The principle we have laid down—that we should not seek to remove impurities from the atmosphere by means of disinfectants, but that we should hinder the pollution of the atmosphere by applying disinfectants to surfaces which are befouling it—has never yet been sufficiently insisted upon, and is diametrically in opposition to much that passes current at the present day. History, too, records curious examples of the contrary procedure. In Dr. Angus Smith's book 'On Disinfectants,' we read that in 1780 Dr. Carmichael Smyth used nitrous fumes for disinfecting purposes in Winchester, and afterwards in the Fleet; and in the year 1802 was rewarded by Parliament with a vote of £5000 for his services.

The impracticability of dealing with the atmosphere by disinfectants can, notwithstanding, be very readily shown. Every chemist who calls to mind the extreme difficulty with which a comparatively small volume of gas is deprived of traces of impurities (for instance, the trace of carbonic acid naturally present in the atmosphere) will comprehend the immense practical difficulty of purifying the atmosphere of a dwelling-room by means of reagents which act by absorption; whilst the necessity, when dealing with the air of a dwelling-room, of not adding so much corrosive or stinking chemical to it as to make it unfit to breathe, is a complete bar to our attempting either the destruction of aerial poisons or the killing of aerial germs by the addition of powerful volatile chemicals to the atmosphere. When we add to the atmosphere of a room a sufficient proportion of an ordinary gaseous disinfectant to act on the atmospheric impurities, we render it unfit to breathe, and fit only to be sent up the chimney. All those mixtures for generating chlorine in dishes exposed in the sick-room, all the cloths soaked in liquid disinfectants and hung up in the room, are more or less futile for the purpose for which they are intended. In this general condemnation we do not include the use of disinfectant cloths to block up window or doorway communicating between the sick-chamber and the rest of the house. This we regard as quite legitimate, and as helping to isolate the patient.

In the selection of disinfectants for use in the sick-room, we should prefer such as are non-volatile and destitute of smell,—such, in fact, as will not themselves defile the air. For this reason, among others, bleaching powder and carbolic acid are not so suitable as some other disinfectants. Copperas and chloralum, possessing the requisite qualifications of being non-volatile and odourless, and being at the same time active disinfectants, are mentioned in the Oxford Disinfection Minute, which we have already referred to, and from which we quote the following:—

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* Reprinted from the *Lancet*, Oct. 14, 1871.

"Waterclosets, privies, cesspools and drains can be disinfected by copperas (sulphate of iron). Carbolic acid can be used with advantage with, or after, but not without copperas. A certain quantity of disinfectant will disinfect only a certain quantity of foul matter; and disinfection is imperfect till all hot smell or alkaline reaction is abolished. For the disinfection of a cubic foot of filth, half a pound of copperas dissolved in a couple of quarts of soft water is sufficient. The daily addition by each individual using a privy or watercloset of two-thirds of an ounce of solid copperas to such privy, or one-third of a pint of the above solution to such watercloset, will keep it wholesome if any accumulation of filth which it may contain or communicate with has been previously disinfected according to the directions given above. Carbolic acid, which need not be chemically pure, can be used after the addition of copperas till the place smells strongly of it. It should be used in the fluid state, its combinations with lime and magnesia having an alkaline reaction, and being therefore unsuitable for the present purpose. It may be diluted by being shaken up with twenty times its volume of water, and if poured from a watering-pot with a rose-nozzle over the sides of a recently emptied privy or cesspool will do great good. Sawdust or sand strongly impregnated with carbolic acid may be used for this purpose. Chloralum (solution of chloride of aluminium of specific gravity 1160) will acidify ordinary sewage, and destroy its living organisms when added in the proportion of one part to forty. It may be expected, therefore, to act as a disinfectant. This cannot be said of chloride of lime. All waterclosets and privies should, when epidemics of cholera or typhoid may be expected, be disinfected whether they be offensive or not. It is well at such periods to avoid using any such conveniences which have not been disinfected, especially if, as at hotels and railway stations, they may have been used by persons from infected localities. All the conveniences mentioned need ventilating as much as living-rooms do."

The subordinate position of carbolic acid is noteworthy. If the experiments and researches that have been undertaken in regard to carbolic acid be reliable (*vide* Crace Calvert, in the *Chemical News* of Dec. 9th, 1870, and Dr. Ballard's remarks thereon in the same journal of Jan. 20th, 1871), then we must admit that undoubtedly carbolic and cresylic acids are about the most powerful of antiseptics; and there are few who will not admit that where carbolic acid can be used, it is the best for direct disinfection. Its odour is *the* objection against it, but still there is a very large number of cases in which the odour of the disinfectant proves no bar to its employment.

The minute also assigns a low rank as a disinfectant to chloride of lime; and here it will not be out of place to indicate the manner in which different disinfectants act on a mass of organic matter in incipient decomposition, such as fæces, urine, etc.

Copperas, chloralum and Burnett's solution (chloride of zinc) absorb the most offensive products of decomposition, which appear to be stinking alkaloids, and in so doing deodorize; they may also act as powerful antiseptics,—that is to say, arrest putrefaction, and so prevent the production afresh of products of decomposition; but more evidence is wanted on this point. Carbolic acid does not absorb the products of putrefaction which has already taken place, but it arrests putrefaction and so stops the further production of products of decomposition. Bleaching powder and Condy's fluid (alkaline permanganate) appear to oxidize the products of decomposition, but they have little power as antiseptics,—that is to say, they have little power of preventing the organic matter from continuing to putrefy. These latter, therefore, are not so economical as other disinfectants.

For use in cesspools and drains there is at present in the market a very cheap material, known as Cooper's salts, and consisting of a mixture of chlorides. It has considerable deodorizing power. It deserves a trial in privies and urinals, and indeed is known to answer in the latter.

Leaving the waterclosets and cesspools, and returning to the sick man's chamber, the first thing demanding attention is the night-stool or bed-pan, which should be charged either with a sufficient quanty of copperas or else chloralum. We think that most persons who have tried the two will be inclined to give the preference to the latter, from its superior cleanliness, and in the form of a dry powder sufficiently cheap to be used to cover the excreta it will be found very convenient. Charcoal or sand to cover up excrement and discharges of all kinds, and these moistened with copperas solution or solution of chloralum, will also answer. But carbolic acid and bleaching powder may be used in the sick chamber, on an emergency, when nothing better is at hand. Chloralum is very likely the best of the non-volatile disinfectants, but its superiority to Burnett's fluid, sulphate of iron, etc., can hardly be said to be as yet established.

The clothes worn by a patient ill with smallpox or cholera should afterwards be burnt, and, as far as possible, the bedding too. Failing this, they should be boiled for half an hour with soap and water, or else exposed to a dry heat of 250° F. In order to produce an appearance of cleanliness, bleaching powder may be used in the subsequent washing of the linen of patients suffering from infectious diseases; but it would be injudicious to rely on that substance as a disinfectant of the linen. Finally, it should be remembered that the surface of every solid which is for a length of time exposed in a sick-room inhabited by patients suffering from infectious diseases is liable to contract a taint, and will need disinfection. The surface of the patient may even be treated, and with great advantage to himself and everybody concerned. In most cases, as is now recognized, a bath will at least do no harm, and in cases of smallpox the addition of some convenient disinfectant to the bath has been found to comfort the patient.

THE PRINCIPLES OF GAS ILLUMINATION.

The important results which usually follow the investigation upon scientific principles of a subject in which previously practice had been founded almost entirely upon empirical rules, have often been urged as a reason for the increased spread of scientific teaching in this country. Doubtless many thousands of pounds are wasted yearly through inability to apply the knowledge of first principles to the common every-day things of life. A fresh instance of this has been furnished recently in the report to the Board of Trade on the construction of gas-burners with reference to the principles of gas-illumination.

At first it might appear that there is a certain lack of appropriateness in this subject for discussion in these columns. But questions continually arise in the development of the investigation which are akin to some of those of the pharmaceutical student's studies and might be expected to furnish points of interest to him.

To this may be added the perhaps somewhat more tangible and important fact to gas consumers, and therefore to pharmacists, that it is considered by the gas referees that half a million sterling—or one-fourth of the whole gas rental—is a moderate estimate of the amount that might be saved annually, in London alone, by the use of good burners. And lastly, the improvement of burners is also a measure of sanitary reform; as the required quantity of light being obtained from a smaller quantity of gas, not only is much unnecessary heat avoided, but the pernicious products of combustion discharged into the air (viz., carbonic acid gas, the sulphur impurities, etc.) are equally diminished.

In the section on the illuminating power of gas with which the report opens, the first question discussed is, Whether the illuminating power is affected by the quantity in which gas is burnt? or in other words, Is it more economical to use small burners or large ones? The doctrine that the light-giving power of gas varies with the quantity burnt, has been held by many eminent men, who have maintained that gas gives a larger proportion of light when burnt in large quantities. Mr. Farmer, of America, has put forth a proposition, known as the "Farmer Theorem," that the illuminating power increases in a geometrical ratio as the square of the gas consumed; *i. e.* that if two feet of gas give a light equal 4, three feet of the same gas will give a light equal to 9, four to 16, etc. This theorem, although accepted in America, has received no support in this country.

The first and most natural suggestion is, to inquire whether the observed variations in the illuminating power are not due, wholly or in part, to the mechanical apparatus employed for developing it. If two tons of identically the same coal do not, when burnt separately, give out the same amount of heat, is not the explanation to be sought in some difference in the mode of combustion? If two gallons of the same water, when weighed separately, do not show the same weight, must there not be some difference in the balances or in the details of weighing? In like manner, if four feet of gas do not give exactly two-thirds the amount of light which six feet of the same gas gives, is not the difference first to be looked for in the nature of the burners employed? Not to take into careful account the influence of the burners, when testing the illuminating power of gas, is as great an oversight as if, in weighing, one were to make no examination of the balances; or as if an engineer were to take no account of the boilers he employed, and then, finding that a ton of coal in some circumstances raised a greater proportion of steam than when half a ton was used, were to jump to the conclusion that the heat-giving power of coal became greater, relatively to the quantity consumed, when a ton was used than when half that quantity was employed.

What a boiler is to coal and the generation of steam, so is a burner to gas and the development of light. One ton of coal in a locomotive of the present day generates as much force as six tons did forty years ago, simply owing to the superior construction of the locomotive. In like manner, as regards the illuminating power of gas, there are good burners and bad ones. Moreover, as every scientifically-constructed boiler is devised specially for a given amount of coal, by the consumption of which the boiler developes its maximum of power relative to the quantity of fuel used; so every well-constructed burner is devised to consume a fixed quantity of gas. Indeed, for every burner, whether good or bad, there is a certain rate of consumption at which the burner does more justice to the illuminating power of the gas than at other rates, whether greater or less. To disregard these considerations, is to render experiments wholly useless and misleading.

As at the same rate of consumption, the light emitted by one burner may be much greater or much less than that of another, so also a burner which does most justice to the gas when the rate of consumption is five feet per hour, will, if the rate of consumption be either increased or diminished from that point, give out less light in proportion to the quantity of gas consumed.

Ignorance of these facts led early experimenters to the conclusion that because one Argand burning 4 feet an hour gave more light than two precisely similar Argands consuming 2 feet each, therefore gas gave more light when burned in the former quantity than in the latter. Upon similar grounds these experimenters might have maintained that because a ball fired out of a rifle with a charge of 3 drs. of gunpowder went further and had more penetrating force than two smaller balls fired out of two similar rifles each with 1½ drs. charge, therefore gunpowder had more explosive force, relative to its weight, when fired in the former quantity than in the latter. Every kind of burner is fitted to consume a special quantity of gas of a given quality, just as much as a rifle is specially adapted for a special ball and charge of powder.

In order to ascertain whether the illuminating power of gas increased according to the above theory a series of experiments was made, when it was found that instead of the gas giving more light as the rate of consumption increased, in every case there is a point beyond which the light decreases relatively to the proportion of gas consumed. This point lies always below, sometimes far below, the maximum of ordinary gas consumption, and varies considerably in different burners. Thus while one of the burners used in these experiments yielded its maximum proportion of light when the gas was burning at the rate of five feet an hour, with another burner that point was reached at less than two feet. It was found also that one burner gave at its best barely one-fifth of the light obtainable from the gas.

In order to account for the origin of the error the referees give some interesting facts. The chief means of obtaining the maximum of illuminating power from gas is to ensure an exactly adequate supply of air to the gas-flame. With Argands this point is easily found, for it immediately precedes the stage of combustion at which the flame smokes, *i. e.* when the air-supply becomes deficient, and a portion of the gas is not thoroughly consumed. Indeed, it may be stated as an absolute rule that *every burner gives its* OWN *maximum of light* (relative to the quantity of gas consumed) *when its flame is just upon the point of smoking.* With batwings and fishtails this point is not easily found, but with Argands (owing to the glass chimney which encloses them and regulates the air supply) it is always possible to increase the consumption of gas to such a point as will make the flame smoke: hence every burner of this kind can be used in a manner which will give the full illuminating power of the gas, *so far as that is dependent upon an adequate air-supply.* Now, as the common fault of Argands is that the gas issues under too great a pressure—*i. e.* with too great a velocity, thereby bringing the flame in contact with too much air—it follows that the worse the Argand, the better will it become when a large quantity of gas is burnt in it; for the air-supply, as regulated by the chimney, being nearly a fixed quantity, any excess in the air-supply can be neutralized by increasing the quantity of gas consumed. But with all Argands, whether good or bad, the larger the quantity of gas consumed in them (short of smoking), the greater will be the proportion of light which they give from the gas.

Other experiments tended to show that the illuminating power of gas remains the same, in whatever quantities the gas is consumed, provided that the right kind of burners be employed in the experiments. Every burner is fitted, and every scientifically-constructed burner is expressly devised, for a certain rate of consumption; and to use a 6-foot burner with three feet of gas would be as absurd as to use a 3-foot burner with six feet of gas.

It was found also in these experiments that there is a point in the rate of consumption below which the maximum of light is not obtained. It has been suggested that this was owing to a fixed quantity of gas being wasted, so far as illuminating power is concerned, it being consumed simply to produce heat in sufficient quantity to render the remainder of the gas incandescent and light-giving. This theory, however, was disproved; and the application of a rough apparatus for diminishing the supply of air, by which in one case the light was instantaneously increased nine-fold, showed that this too resulted from a supply of air unsuited to the amount of gas being used. This leads to the consideration of the air supply.

(To be continued.)

The Pharmaceutical Journal.

SATURDAY, OCTOBER 21, 1871.

Communications for this Journal, and books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

PHARMACEUTICAL EDUCATION IN THE PROVINCES.

THE recently published reports of transactions of local associations all agree in showing that attention is directed to the subject of education, but though, in some instances, there seems reason to believe satisfactory progress has been made, it is impossible to overlook the fact that, in a general way, there is a tendency to look upon special education as a necessity to be met as a matter of form and in the least troublesome way rather than as the chief basis of a successful career. The great aim on the part of students appears to be the acquisition of just enough knowledge of chemistry, materia medica, etc. to enable them to get through the Minor Examination; and in accordance with the usual relationship between supply and demand, the efforts of those who are endeavouring to provide means of education seem to be involuntarily restricted to the same object.

In making this comment on the attempts to establish systematic pharmaceutical education in the provinces, it is not by any means intended to disparage the efforts of those who are in various places exerting themselves to that end; for the tendency above referred to may almost be regarded as a natural consequence of the defective education given to boys while at school. How rarely it is the case that a lad at the time of passing from school to apprenticeship with a druggist has even the most elementary notions of chemistry, physics, or botany! Even in Latin he is frequently deficient. As a consequence such a lad is less able to profit by the practical experience he has while an apprentice, and what he does learn is but little understood. Subsequently, when he seeks to become an assistant, or to go into business for himself, the necessity of passing an examination is regarded as a disagreeable obstacle, and he has recourse to a system of cramming, to help him past it.

Considering the present distracted state of our middle-class educational methods, there is little doubt that some time must elapse before much improvement is manifest as regards the acquirements of those commencing a pharmaceutical career; anp until that is the case, we must be content at seeing apprentices and assistants studying subjects which in Germany or France schoolboys are familiar with.

It is true some schools are now including science among the subjects taught to boys, and in a few there are competent teachers; but that course is still only exceptional, and not unfrequently what is taught as science is merely legerdemain. For improvement in the scientific culture of the younger members of our calling, we would rather trust to the establishment by its senior members of a demand for higher qualifications than are generally to be met with. In this respect much still remains to be done. Looking through the advertisements for assistants, how rarely is it found that certificates of qualification are required! and when particulars are specified, they generally refer only to age, height, appearance, and such like.

THE RELATIONS OF "MEDICAL ETHICS" TO PHARMACY.

READILY and willingly to give advice and information upon every imaginable subject is generally understood to be an editorial function, and this understanding is fully relied upon by some correspondents. But we can easily sympathize with our contemporary the *Lancet*, when we read that it is one of its few "painful duties" frequently "to decide "on matters of professional conduct—to act as umpire "between brethren who, in the practice of their art, "may seem to have forgotten the principles which are "supposed to regulate the conduct of medical men "towards each other, and the public at large." Even the bliss of being "not without a certain authority upon the subject" must be tempered by such a sad necessity. Indeed, the extent of the evil,—and the probability, we presume, that our contemporary's columns will be required for something more interesting now that the dull season is over,—has moved its Editor to say a few words on the subject of Medical Ethics. Of course with the disputes of medical men among themselves pharmacists have no right or wish to intermeddle, but some of the editorial remarks are worthy of their consideration as the opinions of an "authority" on the matters discussed.

The first failing mentioned is the disregard by practitioners of the difference between a trade and a profession. We should not do justice to this paragraph without printing it entire. Here it is:—

"The essential distinction between a trade and a profession is in the nature of the service to be rendered. In the case of trade there is an exchange of wares for money; in the case of a profession, opinion, advice, or skilled judgment is the essential commodity to be exchanged. And some men cannot receive this pure professional idea of service. Perhaps it arises from a modest diffidence as to the value of anything they have to offer the public in the way of opinion or judgment, and so they supplement the real professional commodity with something more tangible. They deal in actual wares—such as tooth-brushes, soaps, perfumery, Tidman's sea-salt, vaccine lymph, cholera mixtures, etc. *Medicine is no longer a trade, even in drugs. Practitioners are under the necessity of supplying drugs to their patients because druggists have not yet discovered the art of dispensing prescriptions on practicable terms.* But this is a mere accommodation to their patients, and not of the essence of their services. A medical man should always, therefore, suspect himself when he finds wares of any kind entering largely into his idea of medical practice."

To the definition of the distinction between a trade and a profession we have nothing to object; but the tender forethought with which the "modest diffidence" of offending professional gentlemen is suggested,—the discrimination between excusable and inexcusable trade,—and the excuse furnished for the excusable,—are all worthy of the acknowledged high talents of the *Lancet* staff.

We are afraid that a suggestion that the low rate of fees charged for professional services by some practitioners arises from their inadequate sense of the value of medical service will be looked upon as a euphemism; but that which concerns us more particularly is the moral pointed.

"We have great respect for all earnest attempts to supply the working man with good medical attendance on terms which are practicable; but it is not to be done by private practitioners advertising their services as available for all and sundry *on terms which would scarcely pay a respectable druggist.*"

What inference are we to draw from this remarkable sentence? Does the prescribing by druggists become tolerable to the *Lancet* when the price paid is below a certain amount? And may we here find the *Lancet's* estimate of the relative positions of practitioners and pharmacists? Of course it is not credible that our contemporary would speak superciliously of chemists and druggists, but the mind insensibly reverts to the phrase, "And not as this publican."

As we have said before, we do not presume to interfere in the disputes of medical men. We are satisfied with ejaculating—

"Tantæne animis cœlestibus iræ?"

But does it not seem remarkable that educated gentlemen should be unable to decide for themselves what is right and proper, when such public discussion might lay them under the imputation of another weakness that the *Lancet* charges them with,—the love of publicity and advertisement? Might we commend to their notice the remark of a modern writer, that "to consume your own choler, as some chimneys consume their own smoke, is a negative, yet no slight virtue, nor one of the commonest in these times." And this especially as the Editor of the *Lancet*—who, on this occasion, has not been able to spare quite three columns—has half intimated that all the twigs of his editorial birch are not yet worn out.

Transactions of the Pharmaceutical Society.

EXAMINATIONS IN LONDON.

October 11th and 18th, 1871.

Present (11th)—Messrs. Allchin, Barnes, Bird, Carteighe, Cracknell, Davenport, Gale, Garle, Haselden, Ince, Linford and Southall.

Dr. Greenhow was also present, on behalf of the Privy Council.

(18th)—Messrs. Allchin, Barnes, Bird, Carteighe, Cracknell, Davenport, Edwards, Gale, Garle, Haselden, Ince, Linford and Southall.

Seven Candidates presented themselves for the Major Examination; *two* failed, *five* passed. Thirty-six presented themselves for the Minor Examination; *nineteen* failed, *seventeen* passed.

The following were declared duly qualified to be registered:—

MAJOR (as Pharmaceutical Chemists).

Maddock, William Thomas	London.
Marks, Benjamin	Plymouth.
Gill, Joseph William	Pendleton.
Woolley, Harold	Manchester.
Browne, Joseph Alleyne	London.

MINOR (as Chemists and Druggists).

*Jameson, William Edward	Bristol.
*Caswell, Thomas George	Dudley.
*Grayson, Charles	Bawtry.
*Redfern, John	Oxford.
Tamplin, Charles Edward	Kingston-on-Thames.
Jones, Moses	Swansea.
Hargreaves, Joseph	Liverpool.
Peel, Alfred	Manchester.
Fuller, John William	London.
Kennerley, William	Manchester.
Mumby, Charles John Everitt	Bury St. Edmund's.
Saunders, Thomas Samuel	Notting Hill.
Grace, Walter Abraham	Liverpool.
Morgan, Rhys Dafydd	Reading.
Marshall, Alfred	Hornsey.
Peake, Arthur	Stalybridge.
Gardner, James Richard	Devonport.

The above names are arranged in order of merit.

FIRST, OR PRELIMINARY EXAMINATION.

Two hundred and twenty-two candidates presented themselves for this Examination on the 2nd of October; eighty-two failed, the following one hundred and forty passed, and were declared to be duly qualified to be registered as—

APPRENTICES OR STUDENTS.

	Brown, Joseph	Croydon.
	Griffiths, Evan	Cardiff.
	Ingham, Thomas Whittaker	Rawtenstall.
Equal.	Hine, Alfred Leonard	Cheltenham.
Equal.	Longman, John Ham	Exeter.
	Chadwick, Thomas Edward	Bradford, Yorks.
	Bond, Frederick John	Tiverton.
Equal.	Crosby, John Briggs	Stamford.
Equal.	Newton, Francis Bourne	London.
	Evans, John	Cardigan.
	Cassels, David Malloch	Lanark.
	Brice, Francis	Leicester.
	Tomlinson, Eldred Edward	Whitehaven.
	Best, John William	Darlington.
Equal.	Jackson, Barnet Edward	Heywood.
Equal.	Mann, George Frederick	Wells, Norfolk.
Equal.	Power, Edward Thomas	Reading.

* Passed with honours.

	Warren, Francis William	Weston-super-mare.
	Bate, Arthur Macaulay	Northampton.
Equal.	Hamilton, Robert	York Town.
	Webber, Robert John	Woolwich.
Equal.	Hall, Robert	Hartlepool.
	Jones, Evan Jones	Lampeter.
	Sindall, George Edward	Knaresboro'.
	Watkins, William Powell	Blackwood.
Equal.	Eynon, Charles James	Leamington.
	Nettleship, Thomas William	Bawtry.
	Rayson, John Thomas	Swineshead.
	Attenburrow, Attewell	Hertford.
Equal.	James, Bryan	Coventry.
	Newton, George Harry	Ashton-und.-Lyne.
	Parkinson, Joseph	Huddersfield.
	Tipper, Jonathan Edward	Evesham.
Equal.	Boon, Nathaniel	Oakham.
	Harris, John	Pontardawe.
Equal.	Blacklock, John	Manchester.
	Goodall, Thomas Sorby	Derby.
	Radford, John Storer	Nottingham.
	Bales, William	Ipswich.
Equal.	Baxter, Thomas Abbott	Stamford.
	Beaven, George Alfred	Southampton.
	Douglas, John	Cockermouth.
	Hooper, James Tapscott	Launceston.
	Pinnell, Arthur	Broadstairs.
	Martin, William Lee	Derby.
Equal.	Morgan, David	Llandilo.
	Williams, Thomas	Welshpool.
	Francis, Rawson Parke	Diss.
	Pickup, William	Blackburn.
	Bishop, Charles Edward	Bristol.
Equal.	Barcham, Henry	Hackford-next-Reepham.
	Cattell, John Thomas	Coventry.
	Dixon, George Frederick	Crediton.
	Owen, George Benjamin	Sheffield.
	Howell, William	Cheltenham.
Equal.	Baxter, William James	Devonport.
	Davies, William	Trecynon.
	Elliott, William Thomas	Stowmarket.
	Lewis, John	Pontardawe.
	Stevens, James	Ripon.
Equal.	Borton, Thomas Bonner	Hull.
	Horrax, John	Keswick.
Equal.	Duncalf, Thomas Henry	Macclesfield.
	Hesk, Thos. Galland Charis	Whitby.
	Radford, George	Chesterfield.
Equal.	Campbell, Charles	Hull.
	Smithies, William Edward	Elland.
Equal.	Bishop, Edward Ernest	Bristol.
	Jones, Matthew Henry	London.
	Lister, Robert	Leeds.
Equal.	Croskell, William Joseph	Liverpool.
	Griffiths, John Moore	Birkenhead.
Equal.	Berry, Robert Innes	Aberdeen.
	Collis, John Tucker	Bristol.
	Moon, Murray James	Godalming.
Equal.	Findlay, James	London.
	Winter, Harry	Cambridge.
Equal.	Gordon, Frederick William	York.
	Jones, John Griffiths	Nottingham.
	Ward, John Septibo	Stamford.
Equal.	Carr, Henry	Rochdale.
	Gregson, Thomas Halliwell	Ashbourne.
	Smailes, Francis William	Filey.
	Solomon, Charles Edwin	Penryn.
Equal.	Oldfield, Frank	Hawkhurst.
	Plant, John	London.
	Stratford, Alfred Joseph	Kilsby.
Equal.	Hockenhull, Philip Hall	Macclesfield.
	March, Richard	Stamford.
	Marks, Frederick Comerford	Wantage.
Equal.	M'Cullock, William	Manchester.
	Payne, Henry	Cottingham.
	Unsworth, Walter	Bolton-le-Moors.
Equal.	Clare, Thomas	Cheltenham.
	Hindle, William	Lowestoft.
	M'Lean, Kenneth	London.
	Rhodes, John Mitchell	Sheffield.
Equal.	Barber, Walter Masterman	York.
	Maud, William Robert	York.
Equal.	Cardell, Richard Taylor	Bodmin.
	Richardson, Edward	Dresden, Staffs.
	Phillips, Charles Lloyd	Tredegar.
	Ward, William Edwin	Nottingham.
	Davies, George Edward	London.
Equal.	Linton, William Tabram	Chichester.
	Taylor, Stephen John	Westbury, Wilts.
	Slater, Elias	Manchester.
Equal.	Cox, Joseph	Nottingham.
	Hayllar, James	Luton.
	Marrion, William	Shrewsbury.
Equal.	Coulson, Charles Edwin	Sudbury.
	Truscott, Lewis James	Looe.
	Owen, John Edward	London.
	Harris, Henry Brock	Bristol.
	Forsyth, Richard	South Shields.
Equal.	Dyson, Alfred	Brighouse.
	White, John Thomas	Dudley.
Equal.	M'Gregor, Peter Gibb Duncan	Colpy Culsalmond.
	Smith, Thomas Henry	York.
	Thompson, Charles	Bedworth.
Equal.	Brouard, Ernest James	Guernsey.
	Empringham, George Edward	Beverley.
Equal.	Anderson, Henry	Guernsey.
	Bowker, William	Bolton.
	Harris, Evan William	Aberavon.
	Houghton, Robert William	Bermuda.
Equal.	Lupton, George Frederick	York.
	Mead, Charles John	Wimborne.
	Parsons, Charles Ernest	London.
Equal.	Coates, Samuel William	Ilkeston.
	Ferguson, William	London.
	Griffiths, Griffith	Barmouth.
	Hues, William Richard	Liverpool.
	Maggs, Frederick Richard	Yeovil.
	Newbould, John Benson	Liverpool.
	Redman, Joseph	Rochester.
	Reeve, Thomas Lewis	Hastings.
	Wood, James	Devonport.
	Young, Horatio Thos. Barmby	Hull.
	Jones, Edward Bevan	St. Neots.

Certificates of examination of the under-mentioned were received in lieu of the Society's Preliminary Examination:—

Cooper, Frederick Ashley	Cockermouth.
Cortis, Arthur Brownhill	Worthing.
Hepworth, Frederick James	Saltburn-by-the-Sea
Hutchin, William F. W.	Maidstone.
Moss, Albert	Ilkeston.
Redfern, John	Oxford.
Reeks, John	Southampton.

The following is a list of towns in which examinations were held, with the number of candidates annexed:—

Aberdare	3	Cambridge	2
Aberdeen	5	Cardiff	2
Abingdon	2	Cardigan	3
Ashby-de-la-Zouch	1	Carmarthen	3
Ashton-under-Lyne	1	Carnarvon	1
Barnstaple	1	Cheltenham	3
Basingstoke	1	Chester	3
Birkenhead	1	Chesterfield	1
Birmingham	2	Chichester	1
Blackburn	2	Cockermouth	3
Bolton	1	Coventry	3
Boston	1	Darlington	1
Bradford	2	Derby	4
Bridlington	1	Diss	1
Bristol	4	Dorking	1

Dudley	1
Durham	1
Evesham	1
Exeter	2
Falmouth	1
Goole	1
Grantham	1
Guernsey	2
Hartlepool	1
Haverfordwest	1
Hertford	2
Hitchin	1
Huddersfield	2
Hull	4
Huntingdon	1
Ipswich	2
Ironbridge	1
Knaresborough	1
Lanark	1
Launceston	2
Leeds	1
Leicester	3
Liskeard	1
Liverpool	4
London	30
Macclesfield	3
Manchester	9
Merthyr Tydfil	1
Middlesborough	1
Neath	1
Newcastle-on-Tyne	1
Newport (Mon.)	1
Norwich	2
Northampton	1
Nottingham	4
Oxford	1
Peterborough	4
Plymouth	2
Poole	2
Preston	1
Ramsgate	1
Reading	1
Ripon	2
Rochdale	3
Rochester	2
Rugby	1
St. Alban's	1
St. Austell	1
Sheffield	2
Southampton	2
South Shields	1
Spalding	1
Stamford	6
Stockport	2
Stoke-on-Trent	1
Sunderland	2
Swansea	5
Taunton	4
Tenterden	1
Tiverton	1
Truro	1
Walsall	1
Wakefield	2
Warwick	1
Welshpool	2
Westbury	1
Weston-super-mare	1
Whitby	2
Wolverhampton	2
Yarmouth	2
York	5

The questions for examination were as follows :—

Time allowed: Three Hours.

LATIN.

Translate into English two or more of the following sentences:—

1. Quum ea ita sint, tamen, si obsides ab iis sibi dentur, uti ea, quæ polliceantur, facturos intelligat, et si Æduis de injuriis, quas ipsis sociisque eorum intulerint, item si Allobrogibus satisfaciant, sese cum iis pacem esse facturum.

2. Biduo post, Ariovistus ad Cæsarem legatos mittit, velle se de his rebus, quæ inter eos agi cœptæ, neque perfectæ essent, agere cum eo: uti aut iterum colloquio diem constitueret; aut si id minùs vellet, ex suis legatis aliquem ad se mitteret.

3. Coque Coccum in Aquâ per quartam horæ partem in vase operto, subinde movens, tum cola, et perfice sicut de Syrupo Althææ præceptum est.

4. Ex his fiat haustus, summo mane deglutiendus. Repetatur idem tertio quoque die.

5. Give the genitive endings, singular number, of the five declensions.

6. How are noun-adjectives of three articles declined? Decline one.

7. State to which conjugation each of the following verbs belongs:—*mitto, repeto, moveo, constituo.*

8. What case do the following prepositions take after them?—*absque, cum, pro, sine.* Illustrate by examples.

9. What cases do gerunds and supines govern? Furnish examples.

ARITHMETIC.

10. A. was born 34 years after B.; how old was B. when A. was 17? and how old will A. be when B. is 70?

11. The planet Mercury revolves round the sun in 88 days; how many revolutions will it perform in 17 years and 219 days, reckoning 365 days to the year?

12. Reduce $\frac{4}{5}$ of a cwt. to its proper quantity.

13. From $5\frac{2}{3}$ take $\frac{9}{10}$.

14. Add $3275\cdot + 27\cdot514 + 1\cdot005 + 725\cdot + 7\cdot32$.

ENGLISH.

15. Of what does syntax treat?

16. Explain the difference between simple and compound sentences, and furnish examples.

17. Name several nouns which are irregular in the formation of their plural.

18. Correct the following:—Flattery cannot hurt none, but those who it is agreeable to.

19. Parse the following:—Industry is the road to wealth, and virtue to happiness.

20. Write from fifteen to twenty-five lines upon *one* only of the following subjects:—

A. The force of example.
B. True courage.
C. The power of hope.

Provincial Transactions.

SHEFFIELD PHARMACEUTICAL AND CHEMICAL ASSOCIATION.

The opening Meeting of the third winter session of this Association was held on Wednesday evening, Oct. 11th, in the Rooms, Music Hall; and the following inaugural Address was delivered by the President, Mr. J. B. Dobb:—

Gentlemen,—There was a time, at no distant date, when the chemist and druggist was treated and considered as a very mysterious man, who knew something of herbs, drugs, chemicals, ointments and plasters; who could tell you something of the firmament as well as of the earth. There were instances of his being an astrologer, a ruler of the planets, a curer of wounds and of all the ailments to which poor man is liable. The chemist and druggist was more of a general practitioner than he is now. The time has been when he was the Esculapius of the town and village; the apothecary, surgeon and physician; the thoughtful manufacturer of pills and boluses, as well as the dealer in drugs. He was often trusted and confided in by most of the people; he was a thorough empiric, having experience only to guide him. There were no laws to prevent him healing the sick and visiting his patients. He was the popular leech; he supplanted the barber with his lancet and his blood-stained pole,—that pole, emblem of blood and linen bandage, stuck out of the front of the shaving shop, how art thou fallen! Thou hast given way to the gilded pestle and mortar over the door of the chemist's shop, and to those quaint-looking bottles in his window. What beautiful-looking liquids they contain!—blue, red, green, yellow and all the colours of the rainbow; surely it must be medicine! Look at the singular golden marks upon those turnip-shaped globes: it must be the name of the stuff in them. What an awfully wise man the proprietor of that shop must be! The educated man looks upon the last relic of the old druggists—the big-bellied globes, with the Egyptian or mongrel hieroglyphics in gilt—with a feeling of curiosity and sacredness, as things appertaining to physic and necromancy. Popularly, the chemist makes, or did make, wonderful profits; nothing less than $11\frac{1}{2}d.$ in the shilling would satisfy the keen faith of the general public. The profit of $11\frac{1}{2}d.$ in the shilling had a surprising effect in overflowing the business with apprentices (accompanied with good premiums also). The supply of chemists and druggists exceeded the demand of the public. This constant influx brought in competition; a living could not be made by the sale of physic; and the chemist was constrained to sell other goods—perfumery, etc., in large towns; paints, oils and colours, and all the odds and ends of domestic requirements in the country to eke out an existence. The time has been within the memory of the present chemists and druggists when most powders had to be ground, rubbed and thumped in a mortar by the strong and powerful arm of the druggist himself or his apprentice. Never shall I forget the hard work, the struggle I had with a nice bit of a mill, the size of a domestic coffee mill, for grinding pepper. Even the grinding of paints on a slab with a muller was all done by the chemist and druggist in the country. Let us be thankful that the colour manufacturer and the wholesale druggist have relieved the present race of chemists and druggists from all this drudgery, and that our young men will have more time at their disposal for cultivating their minds, and acquiring that scientific knowledge, not only for passing their examinations, but for upholding the honour and status that the trade is aspiring and panting for,—changing, I trust, the trade of a chemist and druggist into an honoured and scientific profession. Workmen labour less hours than formerly, so do clerks, manufacturers and merchants. There is a movement in the same direction amongst shopkeepers. Take the dispensing chemist in London and throughout the country; the hours are from eight in the morning until ten or eleven at night in London; in the country, eight to eight, nine or ten at night. These hours are too long. They have a most depressing effect, preventing energy in business and determination in study. I grant there is the danger in our early closing of our young men abusing these hours of liberty, devoting their time to pleasures and amusements (so liberally provided in all large towns, places literally used to entrap the young), instead of using these golden hours in study, and striving to fit themselves for their duties and the battle of life. Provided the hours taken from business were used and not abused by our young people, early closing would be indeed a blessing to all engaged in the trade. Every encouragement should be given to lessen the hours of labour. It should, in my opinion, be done gradually, to see if these leisure hours are properly used. Let us cultivate in our youths a tendency to come to our rooms. The time is drawing near when they will find out that it is a necessity for them so to do. Unless they avail themselves of the opportunity to acquire a knowledge of our specimens of drugs, the pharmaceutical preparations, and an acquaintance with our library in this room, there is every probability when they go to London for examination they will return plucked. A few examples of the simple-minded plucked ones would, I think, do a power of good to our cause,—contributing more to a good attendance at our rooms and our lectures and our classes than all the persuasive powers of the Council of this Association. There is one thing stands very much in the way of this early-closing movement. I allude to the custom and habit of putting up the shutters, but leaving the door of the shop on the latch. The gas burning bright inside is like an invitation to all passers-by that they can obtain what they require inside that establishment, though the shop is "supposed to be closed," and all the staff done work. This custom and habit is of long standing. Those who would close are thus prevented by their neighbours. They say, I will make no pretence of closing. When I put up the shutters I will close the door, and have done with the labours of the day. The medical faculty do not stop in, waiting for patients; the physician's hours are defined except for appointments. I do not see that the public require these late hours of business. I do not see that they even benefit us in a pecuniary sense. And I trust the time has arrived when we may gradually give them up, and find time to cultivate our minds and enjoy the blessings of life,—

> "Not always working, not always playing,
> Doing both, and enjoying both."

Most of you are acquainted with the early history and struggles of the Pharmaceutical Society. There also sprang up the Society of Chemists and Druggists, to prevent what they thought the monopolizing tendency of the old Society. These two Societies struggled, one for supremacy, the other for equality. Better counsels and better feelings alternately prevailed. They had felt each other's strength and power; each saw the other had some good properties; united they would be strong. Lord Elcho advised them to settle their differences; his advice was carried out, and we became an incorporated trade. From the passing of this Act commenced a new era in our history; take Sheffield as an example of the rest of the provinces. A local Association has been formed in connection with and attached to the Pharmaceutical Society of Great Britain, the object being the education of our members, and to enable them to rise to the standard of the Pharmaceutical Society. There is now a fair and open field for those who desire to enter the ranks of the profession of a pharmacist—a profession they cannot enter except by careful study, fitting themselves for responsible duties that will bring honour to the profession, and conduce to the interests of the public. Our trade has been maligned, and twitted with trenching upon the vocation of the medical man. Where do the quacking druggists come from?—the men who place a few coloured bottles in a shop-window as ostensible druggists, and who go out and visit patients, contesting the rounds with the medical faculty. Is it the young men who have served an apprenticeship to the trade?—is it the young men who have passed the examinations of the Pharmaceutical Society? My impression is it is not this class of men. I think you will find most of them come from the surgeries of the medical faculty—students who could not or had not the means of passing their medical examinations; who had been educated and drilled to visit patients. Stable-boys are sometimes taken into a surgery to assist; after a while the dispensing is entrusted to their care; when arrived at mature years, on the ground of wages or other circumstances, they are replaced by other youths. What becomes of these men? If they have got a smattering of the knowledge of medicine, such men have often commenced as chemists and druggists, visiting patients and administering such physic as they were accustomed to make up in their masters' surgery. It has often been proclaimed to the public through the medical journals that chemists and druggists more or less live upon quackery, and are a class whose privileges should be curtailed. When you see a druggist visiting patients, you will generally find he has acquired the habit and learned the rudiments of such a practice in a surgery. Who is responsible for such a state of affairs? I assert, the medical profession; they had educated the men for such a style of business, and it is a libel on the trade to charge us with that for which they themselves are principally liable. I advise our members on no account to poach on the domain of the medical faculty by leaving their shop to visit patients, but hold on to their right of prescribing behind the counter. You have as great a claim to that right as the medical faculty have to dispense their own medicines. When they are prepared to give up such a practice, then it will be time for the chemist and druggist to consider the propriety of giving up prescribing behind the counter. Let us be thankful that this practice of going out to visit patients will, to a great extent, become an experience of the past. I cannot imagine a man who has obtained his diploma as a pharmaceutical chemist, or as a chemist and druggist, adopting the practice of visiting. Should he do so, he would at once lose caste, and take a low standard in the scale of his profession. There is a bright and prosperous future open for apprentices and students who qualify themselves to pass the examinations of the Pharmaceutical Society. There cannot be that amount of huckstering competition that has been the rule hitherto. We, the old and middle-aged chemists, may not live to see our hopes realized; but we shall have this consciousness that we have fought to clear the way for our younger brethren. Provided no benefit accrues, which we cannot expect, the honour, the emoluments and the status in society occupied by you as scientific, educated chemists and druggists, will all be yours. Reap the advantage of our exertions, and we shall be satisfied, feeling that we have done our duty in striving to raise the position of the trade, and conferring a benefit upon society, by placing intelligent, educated men at their disposal for the compounding and dispensing of medicines. In the future I look for the explorers of nature's mysteries, those close reasoners and thinkers, the analytical chemists, to spring out from the men who obtain the distinction of pharmaceutical chemists by examination. In the future, what is now a trade, will, I believe, be split up into several trades: the hairdressers are fully capable of retailing perfumery, tooth-brushes and all the articles of the toilet; oil and colourmen can undertake the mixing and selling of paints, oils and colours; the grocers, of pickles and fish-sauces; and the drysalters, of chemicals and drugs used for manufacturing purposes; at the present time, all these articles, more or less, are dealt in by chemists and druggists.

During the last two years questions have arisen of great importance to the trade, and given great anxiety to your Council. I allude to the proposed compulsory poison clauses. At one of our special meetings the following resolution was passed:—"In the keeping and dispensing of poisons, the heavy responsibilities resting upon members of the trade tend to make them take the most careful precautionary measures to prevent accidents. And as every business is so varied and peculiar in its character and circumstances, each principal ought to remain at liberty to make such arrangements as will best suit his own peculiar case, and any definite legislation on the subject would be unwise, inconvenient and unnecessary."

Mr. Wilson and Mr. Hill were deputed to represent the Association at the Annual meeting of the Pharmaceutical Society, well and truly did they do their duty. Recently, when deputations were received by the Pharmaceutical Council on the compulsory poison clauses of the proposed Amended Pharmacy Act, Mr. Wilson and Mr. Preston went to London to express the feeling of the Association on that question. They had conferences with both our borough members and others; they worked hard. They were armed with the following resolution, passed at a special meeting of our Association in this room:—"That partial legislation on the subject of poisons is impolitic and unjust, and that any legislation that does not apply equally to surgeons, apothecaries, veterinary surgeons, hospitals and dispensaries, cannot be deemed satisfactory." These views were impressed on the minds of those members of Parliament and others with whom they came in contact, by Mr. Wilson and Mr. Preston; and I am justified in saying with very great success. The Bill was withdrawn. Let us maintain these principles, and act energetically when the time comes, as come it will. The subject is not closed or ended; show the same determination that you have done the last six months, and I do not fear the result.

In conclusion, I beg the young members, apprentices and associates will take an interest in these rooms. The museum, library and microscope are all at your service for study. I impress upon you the importance of a regular attendance upon the classes and lectures held here. The Council have found the principal means hitherto, and are working hard, to give you every opportunity for acquiring such a knowledge as will enable you to pass your examinations, and to join with credit the scientific profession of a pharmaceutical chemist. All this is of little service to the old chemists and druggists. The advantages are all your own; assist us by your subscription, with your personal interest in the work, and use your influence with your fellow-apprentices and assistants. Such attention on your part will amply compensate your Council for all their labours on your behalf.

The address was heard with great attention, and was frequently applauded.

A cordial and unanimous vote of thanks, proposed by Mr. Wilson, seconded by Mr. Radley, and supported by Messrs. Cocking and Preston, was then passed to the President, and other business having been transacted, the meeting terminated.

The following gentlemen were elected associates:—Messrs. Boulton, Corbett, Field, Holmes, G. M. Jones, H. D. Jones, and Mellor.

LIVERPOOL CHEMISTS' ASSOCIATION.

Twenty-Third Session, 1871–72.

Mr. Edward Davies, F.C.S., etc., President; Mr. Charles Jones, Vice-President; Mr. John Shaw, Treasurer. Council—Messrs. Abraham, Mason, Murphy, Redford, Sharp, Sumner, Symes, Tanner. Honorary Secretary—Mr. Joseph Hallawell, 10, College Lane.

The First General Meeting was held at the Royal Institution, on Thursday evening, the 12th instant. The President, Mr. E. Davies, F.C.S., in the chair.

The Minutes of the previous Meeting were read and signed. Messrs. E. Alfred Webb, James T. Armstrong, and J. Rigby were elected Members. Messrs. C. F. Pearson, W. A. Jones, and Arthur Anderson were elected Associates of the Association.

The Secretary announced the following donations received during the recess:—The Year-Book of Pharmacy, 1871,—The Register of Chemists and Druggists, 1871,—The Report of the Smithsonian Institution, Washington, U.S. 1869,—The Chicago Pharmacist,—The New York Druggists' Circular,—The Pharmaceutical Journal,—Proceedings of the Liverpool Naturalists' Field Club,—Proceedings of the Liverpool Architectural and Archæological Society.

The President read his opening address:—

Gentlemen,—In coming before you in the honourable position of your President, I feel that I can only look upon myself as an example of your willingness to reward work, earnest and faithful, however imperfect, which has been given to our common object, the improvement of practical chemistry. I trust that my elevation to the office will not cause any distrust in the minds of pharmacists in our Association, lest one great object of its existence should be neglected, by undue prominence being given to the scientific branches of chemical study, for I believe that no sure progress can be made, in this or any other department of science, unless theory and practice, the purely scientific and the purely business views go hand in hand. The mutual dependence of the scholar and the tradesman each day becomes more evident, and no feature of modern opinion is more striking than the prominence given to science training. There is, however, an erroneous idea in the mind of many that a special department of a science can be taught, and that one man may learn dyeing chemistry, another alkali-making chemistry, and another pharmaceutical chemistry. Now this, in my opinion, is a mistake, and having tried to work (to order) in this way, I find it no use. It might be possible thus to "cram" for an examination, but knowledge to guide a man in the unexpected difficulties of daily life must be built on a broader foundation. It is easier, too, to lay hold of, and to retain a principle than a mass of unconnected detail, and, for an example, he will more intelligently and more accurately test the quality of drugs, who in a regular course of study has mastered qualitative analysis, than he who has laboriously committed to memory every test given in the Pharmacopœia. I would therefore employ a portion of our time this evening in a defence of pure science, the study of chemistry, as if money value were a thing unknown, and the attainment of truth for truth's sake. And this need not, nay should not be inconsistent with a hearty acceptation of the realities of life, and a careful performance of its meanest details.

To look at the past. There was a time, and it is startlingly near to our own, when there was no science of chemistry, nothing but haphazard, uncomprehended experiment. This was the case in all its departments, but in medicine there was no attempt at system. Even when plants ceased to be gathered under fixed planetary influence, the cause of their specific influences was veiled by the impossibility of separating one definite substance from an organic, heterogeneous mass. But pure chemistry came to the rescue; and we owe to it the long list of vegetable alkalies, many vegetable acids, and we may hope that every drug will, in time, yield its active principle, to be administered in a small compass, and without nauseous accompaniments, which in many cases are useless.

In these researches there was at least some idea of immediate use, and a definite object was before the experimenter's mind; but, not bound by the actually existing, the chemist begins to create new compounds not found in nature, and which to many are the sheerest nonsense, waste of time and thought. Yet in medicine alone we owe to such men chloroform, chloral, carbolic acid, etc., now recognized as most valuable means of healing; and no doubt yearly additions will be made to the list. Apomorphia seems certain to win a place in our pharmacopœias, and Dr. Richardson is making experiments with bichloride of methylene, chloride of methyl, amylene, hydride of methyl and methylic ether, which promise to give us an anæsthetic without the danger and nausea of chloroform,—methylic ether seeming to be the nearest to perfection.

It has occurred to me that a promising field for investigation would be the study of the state of combination in which the more powerful active principles are found in the plant. The probability is that, whilst the more striking properties of an alkaloid, such as the narcotic effects of morphia, are seen in the free alkaloid or any of its salts, the action of the acid cannot be null. As, in mineral chemistry, salts containing the same metal differ widely in their properties, so it cannot be of indifference what acid we combine with vegetable alkaloids. It is fashionable to exclude all mention of design now, and to urge that quinine and morphine were meant for the use of man is to sacrifice one's reputation for scientific sanity; yet I cannot give up this old-fashioned notion, and, if it be true, is it not at least probable that the natural combination will have valuable properties? Meconate of morphia is a preparation in point, and quinate of quinine and igasurate of strychnine would, I think, be worthy of trial.

The pharmacist may say, what is all this to me? Simply this: he will have, ere long, to deal in these things; and ignorant handling of edge tools, as these unquestionably are, is a fertile source of accident. It should never be forgotten that to pharmacists we owe many of these potent remedies, and the names of Robiquet and Pelletier are indelibly associated with the organic alkaloids. We need not, however, confine our attention to organic chemistry; in mineral chemistry new remedies are constantly springing up, and the chemist should know what these new salts mean. In the old time, when there were scarcely any pure definite medicines, the chemist might do without chemistry, and his vegetable materia medica was the *sine quâ non*. Now we bid fair to make chemistry the chief study, and in the future the knowledge of the actual sources of our medicinal agents may be only interesting to pharmacists in general as objects of curiosity, which they are not called upon to handle.

In connection with this subject, it is remarkable that, at the last meeting of the Pharmaceutical Conference, the greatest prominence was given to such subjects as apocodeia, hesperidine and other definite chemical substances.

I therefore call upon all students—and, I trust we are all included in that class,—but especially on young men, to make their knowledge of chemistry, as of every other branch of study, thorough so far as it goes. "Learn to know it, not to know about it," to use Canon Kingsley's advice; and depend upon it you will pass a better examination, and more intelligently appreciate anything new than by an attempt at "technical" knowledge.

Cramming is the worst phase of this one-sided work, and should be hated as a lie. For it is a lie, it is a pretence of knowledge to veil ignorance, and like all lies, lands its user in disgrace And it is a transparent veil, for any examiner up to his work is sure to detect it; it has an artificial look and is sure to have weak points. Practical work is the best means of avoiding this snare, and although lectures, illustrated as fully as possible, are the best means of showing the formation of chemical bodies in the actual position of most pharmaceutical students who have no laboratories and not too much money or time, yet analysis, qualitative at least, can be carried on with half-a-dozen test-tubes and the chemicals around them. But then the knowledge of this should be more than that such a test reveals the presence of such an impurity, and then, when the reason of the test is shown, the student finds that each analysis includes a synthesis, and thus both sides of chemical practice are seen at once. The present state of pharmacy in England will justify me in making my address mainly a call to exact scientific knowledge. Knowledge was always good, now it is indispensable, and from pharmacy will shortly be banished the reproach that it was the one business that a man could conduct without any knowledge of the things he dealt in. The grocer knows the quality of his tea and sugar, the draper is profound in fractional differences of value in his wares, and the pharmacist should be at least as well informed in his line, nay, rather should be incomparably more so, for you or I can form a fair idea of our food and clothing for ourselves, but the outside world have and can have no means of ascertaining the value of what they get out of a chemist's shop, whilst the issues involved in the two cases have no standard of comparison. I shall survive a bad coat, and possibly may a cup of Moning congou, but the quality of a drug may make the difference of life and death. Who, then, will any longer speak of the hardship of having to prepare for so responsible a vocation?

Then the examinations have a distinct and definite value. Conducted under independent control, the public have a guarantee that they are a real protection, and Dr. Greenhow's report on the examinations will impart a confidence to the public which I fear they were losing. Perhaps the *Pall Mall Gazette* may have exaggerated the terrors of the public when it suggested the desirability of hanging a chemist, but such a suggestion would have fallen very flat if it had been known that every chemist knew what he was about and that no ignorant man was in the profession. In one generation this vision will be realized; and before that time year by year will thin the ranks of the incompetent, and swell those of men whom the world will trust without fear.

I have no wish to trespass on such dangerous ground as that of regulations for storing poisons. Yet the cry for them, not at all general I grant, seems to me the natural result of the action of chemists themselves. Have they not urged the importance of compulsory examinations, and pointed to the public the danger of uneducated men being allowed to handle poisonous drugs? Can it be wondered that the world believes what it has been so earnestly told by those who ought to know best, and that as the men are there and cannot be turned out, precautions should be insisted on? May an outsider, in one sense, be permitted to make the suggestion that voluntary regulations, to be any good in satisfying a public demand, must be made public, and that the world must know who does and who does not adopt them? I trust this guarded allusion to the subject may not expose me to the wild attacks of some warriors who show that, alas, man is a fighting animal by nature, and can hardly believe that any one who opposes them is sane or honest.

Few things are more remarkable in our English manners and customs than the respect we pay to the right of every man to do wrong. I know that there are laws and penalties for breaking them, but there is a tenderness, especially for highly respectable sinners, that contrasts sharply with the practice of our Continental neighbours, and even of the Americans. In nothing is this more strikingly shown than in our laws with regard to adulteration. First there is a statement that there is a great deal of adulteration, that adulteration is a very bad thing and ought to be punished; and then follows a law screening the malefactor in every possible way, and giving the utmost possible trouble to any one moving in the affair, coupled with conditions to render a conviction impossible unless the adulterator is an absolute ass, which, as a rule, he is not. The public conscience is then satisfied, and we wait for a time to see what will follow. Of course, nothing follows, until a roused British public again stirs itself, to be pacified with a repetition of the farce. Nothing will put down adulteration until the law makes the seller responsible for all adulterations, injurious or not, and then let him, if innocent of actual knowledge, have his remedy against the manufacturer. I say adulterations, injurious or not, for in many, nay, most cases, the admixture is one which no chemist can stand in a witness-box and swear is in itself injurious to health. It is robbery which is to be punished quite as much as doing bodily harm, but who can tell the injury done to health by a mere diminution of nutritive power in food by the addition of a substance harmless *per se*.

Certainly, if a man sold anything openly as a mixture, no objection could be taken; but what a disgrace to English tradesmen that it is supposed to be necessary to ask them if their goods are pure, and that if you do not, you are to have no remedy, the assumption being that you were a fool to trust to their honour.

Among pharmacists I am willing to believe that there is not much wilful addition to their drugs; and in this I am borne out by the analysis of some 150 articles purchased by the Sanitary Association of Manchester several years since and analysed in a laboratory in which I was an assistant. But the use of inferior qualities of drugs, I fear, cannot be denied, and no Act of Parliament will ever reach this. Nothing but a higher sense of honour, a feeling that it is a shame to violate the trust placed in them, which we may hope to be a result of higher education, will remove the temptation from what I believe to be a minority of pharmacists, to swell their profits this way. Of course, I may be told the public are themselves to blame, they will have food and medicine cheap, and therefore must have it so, and also nasty, but I do not see that this is the necessary result, and I would ask, is not the public more tempted than tempting?

A question which is in my opinion of the highest importance to you as subject to the Pharmacy Act, is, how this education, which we all say is a good thing, can be obtained? I have no means of obtaining a correct figure, but may say that in Liverpool there are many young men who will have to pass an examination before they can begin business.

For chemistry there are many places where instruction is given, though I regret that in connection with our own Association, the opportunities are imperfect. I should be glad to be able to afford time for two classes, in one of which the higher branches of chemistry, especially a fair amount of organic chemistry, could be taught. But this I cannot manage; and I am of opinion that it will be found necessary eventually to have an independent school of pharmacy, where instruction in all branches necessary to be known by pharmacists, can be obtained. But then two things will be necessary, 1st, a more thorough conviction on the part of employers that they have duties as well as rights towards young men in their employ. Opportunities for attendance on instruction must be more freely given, and not only so, but time for study. This no doubt involves the other question of late hours of business. I cannot work mentally with any effect when I am physically tired; and though there will always be a few who to indomitable perseverance unite physical strength, yet it is not fair to expect these advantages in all. 2nd. Those who enter upon this calling must expect to find their education costly in comparison with that of their predecessors. Education given gratis, or indeed at anything under the fair market price, ought not to be looked for, nor can it be depended upon as a certainty. To ask a young man intending to enter upon the calling of pharmaceutist to spend, say £10 each year of his apprenticeship on lectures and practical chemistry, may seem hard, but so far as his calling is to be looked upon as a profession, there must be a professional training. If this could be done in Liverpool, we could have proper systematic teaching, not spasmodic efforts, but a regular school, and surrounding towns would, no doubt, send us students.

During the session I hope this subject will have full consideration.

And now with regard to our own Association, in whose prosperity I have felt much interest ever since my arrival in Liverpool. There is always a risk of falling into a state of apathy in a society when its freshness of youth has gone, but I should like to see some new life invigorating it.

I hope that I have shown sufficient field for scientific chemistry in the department of pharmacy to induce the scientific chemists of Liverpool to take more interest in the Association. This is not a trade society, it does not lay down laws for the regulation of business, nor interfere with the right of every member to pursue his own course of action. Its expressed object is "the advancement of chemical and pharmaceutical science." All therefore who wish for this are welcome, and if they can tell us something new, whether money can be made out of it or not, they are doubly welcome. At the same time, the Association is not a speculative society, with no practical action. Business, yours and mine, must be attended to, we must live, at least *we* see the necessity; and improvements in carrying on such business, or social reforms bearing on it, are fair subjects for our consideration. Your Council in their report ask for more pharmaceutical papers. I hope I shall not be supposed to be advocating a course of opposition to the Council in any remarks that I have made, rather, as Arnold said of religious books, we do not want more of these, but rather works on secular subjects religiously treated, so I do not ask for pure chemistry papers, but pharmaceutical papers treated in the spirit of pure chemistry; and not chemistry alone, but botany, hitherto conspicuous by its absence, should have its fair share of attention, and I trust that materia medica, both chemical and botanical, will be represented in the report of the proceedings of this session.

The results of the microscopical examination of drugs as a test of their purity is another subject worthy of notice. In the discussions let there be life. If the reader of the paper is wrong, correct him; if you differ from him, do not fear to express it. I would rather be soundly attacked, and put on my mettle in defence, than receive nothing but formal thanks. Most readers of papers, I think, will feel with me that criticism—sharp, if necessary—is preferable to want of interest or unfelt adulation, so long as it is good-humoured and fair.

The Council's call for short papers I will endorse. It is a rather serious thing to set oneself the task of occupying an entire evening of the Society; but surely a single observation, fairly studied and worked out, is within the reach of many of our members. We should thus get some original observations, I hope, and greatly increase the value of our proceedings.

The session is now inaugurated, and its success depends upon you. The President has his duties, and will try to fulfil them; you have yours (strange as it may sound), and may I call upon you not to be mere recipients of the good things of others, but to be fellow-labourers.

I look for your co-operation and support. I take the chair with pleasure, as marking your appreciation, but not with self-confidence. With your help, I look forward to meetings pleasant and also profitable, and, when I lay down my office, shall be rejoiced to find that, in my hands, the Association has not suffered loss, but has been made more helpful to the best interests of the pharmacists and also to the chemists of Liverpool.

Mr. Shaw said he rose with much pleasure to propose a vote of thanks to the President for his able and practical address. The remarks in respect to adulteration he fully endorsed, and considered the admixture of innocuous substances with medicine or food highly censurable, although they might not be positively injurious to the system. The educational question was now coming prominently to the front, especially as regards the provinces, and will require to be dealt with more vigorously. Repeated applications for grants of money for the provinces had been before the Council in London during the past twelve months, and it was a subject requiring very careful consideration. The changes which had been brought about by the passing of the Pharmacy Act, pointed to the establishment of centres of education, and he hoped that Liverpool would not be behindhand. He alluded to the efforts made by the Birmingham Local Association to procure an efficient and inexpensive education on pharmaceutical subjects. With regard to our own Association, the President had rightly stated that membership of the Liverpool Chemists' Association was not confined to those following the profession of pharmacy, but included all who took an interest in the advancement of chemical science, and he trusted now that he (Mr. Davies) occupied the presidential chair, he would draw around him many young men who were engaged in the various chemical and other works in Liverpool and vicinity, and that the Association would continue to prosper and afford facilities for the instruction of the rising generation of pharmaceutists.

Mr. J. Abraham seconded the motion, which was carried with acclamation.

The President returned thanks, urging upon students the necessity of studying at home before coming to the lectures, if they wished to make satisfactory improvement.

MANCHESTER CHEMISTS AND DRUGGISTS' ASSOCIATION.

The Third Annual Meeting of the above Association was held in the Memorial Hall, Albert Square, on Friday evening, October 13th; the President, Mr. W. S. Brown, in the chair.

The Honorary Secretary, Mr. F. Baden Benger, read the following Annual Report:—

Your Council have again the pleasure of presenting a satisfactory report of the condition and prospects of your Association. Though the number of members and associates has slightly decreased, several having left the neighbourhood and a few declined to renew their subscriptions, the Association maintains its position as the largest provincial society of chemists and druggists, and inferior to none either in the importance of the work it has originated or the energy with which its objects have been promoted.

During the past session six ordinary monthly meetings have been held, at each of which a paper or lecture was given by a member:—"On Pharmaceutical Education and Apprenticeship," by Mr. F. Baden Benger; "On Heat," by Mr. J. T. Slugg, F.R.A.S.; "On Pharmaceutical Examinations," by Mr. Siebold; "On the Importance of Some Knowledge of Anatomy and Physiology to the Pharmacists," by Mr. Hampson; "On Dispensing," by Mr. Halliday; "On the Stars," by Mr. J. T. Slugg, F.R.A.S.

The associates of the Society also met weekly, during the winter months, in the Reading Room; at each meeting a paper was provided and a general discussion followed. Considerable additions have been made to the library, by purchase and donations. Mr. Joseph Ince may perhaps be specially alluded to as the donor of a very valuable collection of autograph prescriptions, which has proved so useful to the students. The reading-room has been opened three evenings a week during the year, and students have been admitted at any hour on application to the Honorary Secretary. Copies of the *Lancet*, *Pharmaceutical Journal*, *Nature*, *Chemical News* and the *Chemist and Druggist* have been laid on the table as published. The expense to the Association, thus incurred, for rent, gas, attendance, etc. has been great, but your Council believes that this effort to meet the requirements of assistants and apprentices has been appreciated by them.

The number of students attending the special pharmaceutical courses at Owens College was as follows:—Chemistry, 19; Materia Medica, 16; Pharmacy, 17.

The Botanical Course and the Latin Classes were open to others as well as pharmacy students, and the attendance was consequently much larger. Eight pharmacy students entered for three or more courses, and thus became entitled to the reduction in fees afforded by the College.

The special prizes given by your Association were awarded by the professors as follows:—

Chemistry Lectures.—Prize and First Certificate, Alfred H. Jackson; Second ditto, William Marsh; Third ditto, Walter Twelvetrees; Fourth ditto, Thomas Hart.

Materia Medica.—Prize and First Certificate, Alfred H. Jackson; Second ditto, John Thorpe; Third ditto, William Marsh.

Pharmacy.—Prize and First Certificate, Alfred H. Jackson; Second ditto, Frederick Richard Cooper; Richard E. Taylor; Fourth ditto, Charles James Wilcox.

Mr. A. H. Jackson took also the Second Certificate in the Lower Middle Latin Class and the Prize and First Certificate in the Botany Class; and Mr. William Marsh took the only certificate given in the first year's course of the Chemistry Laboratory Class.

A sum of three guineas has been presented by Mr. T. G. Gibbons, to be offered as a prize in any way your Council shall decide. The conditions upon which this prize may be competed for will be shortly announced.

At one of the monthly meetings of the past session the consideration of the proposed poison regulations was referred to your Council, with a request to take action thereon; this resulted, as is known to most of you, in the formation of the "Chemists' Defence Association," a society numbering upwards of 500 members. This Association, in conjunction with the "Metropolitan" and "North British" Associations, established with similar objects, was mainly instrumental in organizing a successful opposition to the Amended Pharmacy Act.

The monthly meetings of last session were held alternately in the afternoon and evening of the first Friday in the month, tea being provided half an hour before the commencement of business at the evening meetings; by this means, pleasant social intercourse was promoted. And it is now proposed to hold all the meetings in the evening, in order to afford as many assistants and apprentices as possible the opportunity of attending; the chair will be taken at 8 p.m., instead of 7. Tea, coffee and refreshments will be provided at half-past 7. Professor Williamson, F.R.S., will lecture at one of the forthcoming meetings; and for the remainder, well-known members of the Association have promised papers on subjects of much general interest: your Council trusts that these gentlemen may be encouraged by the large audiences they deserve. The objects for which your Association labours, viz., the higher scientific education of apprentices and assistants, mutual improvement and cordial intercourse, are so important to the whole trade, that your Council again urges you to make them widely known amongst your pharmaceutical friends, and by thus strengthening the hands of the executive, enable it to carry forward its original design of establishing in Manchester a museum and school of pharmacy.

Your Association has lost during the year a much respected member by the death of Mr. Charles Wright. It has also just suffered an almost irreparable loss by Mr. Robert Hampson's removal to London. Mr. Hampson has been one of the most active and zealous members of Council, and is known to all of you as the author of papers of very great ability, read at our meetings, and as the indefatigable honorary secretary of the Chemists' Defence Association. Mr. Hampson will carry with him the heartiest good wishes of every member and associate.

As will be seen from the Treasurer's statement, the financial position of the Association is good. In the general account there remains a balance in hand of £73. 6*s.* 10½*d.*, and in the library fund account a balance of £28. 5*s.* 1*d.* Under these circumstances your Council has abstained from making any application for aid from the funds of the Pharmaceutical Society.

The Treasurer, Mr. G. S. Woolley, then read his statement of accounts as follows:—

The Treasurer in Account with the Manchester Chemists and Druggists' Association.

		£.	s.	d.
1870.				
Oct.	To Cash in hand	0	2	5½
	,, ,, in Bank	73	17	3
	,, ,, 101 Members	50	10	0
	,, ,, 3 ,, 1871-2	1	10	0
	,, ,, 84 Associates	10	10	0
	,, ,, 2 ,, 1871-2	0	5	0
	,, ,, 13 Price Lists	0	13	0
	,, ,, T. G. Gibbons, Esq., for a Prize	3	3	0
Dec. 31,	,, ,, Bank Interest	2	1	5
		£142	12	1½
	To Balance down	£73	6	10½

	£.	s.	d.
1870-71			
By Cash for Stationery, Stamps, Printing and Advertising	13	9	3
,, Cash to Owens College for Prizes	3	1	6
,, ,, Rent of Room, Rates, Gas, and Water	29	9	2
,, ,, Porter for taking charge of Rooms	7	19	0
,, ,, Memorial Hall	7	7	0
,, ,, Gas Meter	1	8	6
,, ,, for Tea	3	5	6
,, ,, Periodicals	1	0	0
,, ,, Sundries	2	5	4
,, Balance in hand	2	7	8½
,, ,, ,, Bank	70	19	2
	£142	12	1½

Library Fund.

		£.	s.	d.
1870.				
Oct.	To Cash in hand	28	5	7
	,, Subscriptions received	4	3	6
		£32	9	1
1871.		£	s.	d.
Feb. 10th.	By Cash for Books	4	4	0
	,, Balance in Bank	28	5	1
		£32	9	1

The Chairman in moving the adoption of the report, congratulated the members on the fact mentioned in the report, that their Association was the largest of a similar character in the provinces; at the same time it was a matter of regret to the Council that the Society was not much larger, the number of those connected with it was slightly smaller than last year, and very considerably less than in the previous one; he was grieved to have to state that the entries made for some of the classes at Owens College had not been yet sufficient to ensure their commencement. These classes had been the hope and pride of those who had taken the trouble of organizing them; every endeavour had again been made to bring them under the notice of those for whom they had been intended; a special circular had been issued by the Secretary, but a general indifference seemed to prevail. The allusion made to Mr. Hampson in the report was well deserved. Some of the most important work done in connection with the Association had originated with him. The paper read by him before the Association, on "Remunerative and Uniform Dispensing Charges," had resulted in the issue of a scale of prices, which had proved most useful in their own city and had been very widely adopted in other towns. Mr. Hampson's connection with the Defence Association had involved the expenditure of much time and money. He (Mr. Brown) hoped that the poison regulations question would not be again raised in Parliament; but, should it be, he believed that the same energy which Manchester and other places had displayed would again defeat it. It was the intention of the Council to make, during the present session, considerable additions to the library and museum; and should the income of the Association justify it, to take larger rooms for the accommodation of students. It would be, he was sure, a source of satisfaction to all connected with the Association to know that it had preserved its independence, and had neither received nor asked assistance from the funds of the Pharmaceutical Society, knowing how much those funds were needed by smaller and weaker associations.

The adoption of the report was seconded by Mr. Varey Pickup and carried unanimously.

Mr. G. S. Woolley, in proposing the re-election of the President, after alluding to the obligation the Association was under to Mr. Brown for his zealous and constant efforts for its advancement, said his name should be coupled with Mr. Hampson for his self-denying exertions in opposing the Amended Pharmacy Bill.

The resolution was seconded by Mr. Bostock (Ashton) and carried with acclamation.

Messrs. Slugg and Wilkinson were then re-elected Vice-Presidents; Mr. G. S. Woolley, Treasurer; and Mr. Benger, Secretary.

Messrs. Hall (Salford), Mumbray (Higher Broughton), J. Waterhouse (Ashton) and Hermann Woolley (Market Street) were elected to fill vacancies in the Council; and Messrs. Standen Paine and C. A. Johnstone, Auditors.

Mr. G. S. Woolley expressed the pleasure it gave him to see many associates present who took an active part at the weekly meeting of assistants held in the reading-room last session. He had frequently heard from students how much assistance they had derived from the collection of materia medica and botanical specimens in the room; his firm would be glad to replenish the drawers when necessary.

Mr. Benger said he could not allow that occasion to pass without expressing the very great regret he felt at the threatened collapse of some of the pharmaceutical classes at Owens College. He felt that it was a very great humiliation, not only to the Association, but to the great city of Manchester and surrounding district, that there were not found ten men to save the honour of the Association and of the trade by supporting the pharmacy and materia medica courses. It was not yet too late to retrieve that honour: a few more entries would save them from the disgrace of breaking down, and he hoped that those names might yet be sent in. With regard to the evening meetings, their interest and usefulness might be greatly extended by the more cordial co-operation of associates. Though the primary object of making communications to the evening meetings was undoubtedly to give information, a secondary and scarcely less important one was to elicit it; and he felt sure that there was scarcely an assistant or apprentice present who did not meet with some little pharmaceutical difficulty, or interesting fact worth investigating, during the month between the meetings. If they would forward to him any such queries, he would take care that they should be introduced at the next meeting. The discussion thus induced would probably prove useful to all.

Mr. Louis Siebold (Lecturer on Pharmacy at Owens College) then made some observations on what he believed to be the chief causes which had operated against the success of the College courses; it grieved him to say that it was mainly the indifference of those for whom they were intended. When he remembered that in 1868, immediately after the passing of the Pharmacy Act, they had in Manchester classes of upwards of fifty young men studying these subjects, and that comparatively few of these had passed their examinations, he knew that the material for large classes still existed; at the same time he knew of many instances in which the responsibility rested with the masters, who refused to allow their *employés* the necessary time. In one case which had come under his notice, a master had insisted on an apprentice serving one day in addition to his term of apprenticeship for every day he had attended lectures. He believed that the difficulty was only a temporary one; not one apprentice in twenty could pass his examinations without assistance, and sooner or later they would have to seek that help which they now rejected.

The Chairman then announced that the next ordinary monthly meeting would be held on Friday evening, November 3rd, when Mr. Wilkinson would read a paper "On Some of the Difficulties of Practical Dispensing." There would be tea at half-past seven, and the chair would be taken at eight o'clock.

Parliamentary and Law Proceedings.

Poisoning by an Overdose of Morphia.

On Saturday morning, October 14, an inquest on the body of Dr. Poole, was held at Hyde. Deceased was found dead in bed, and the evidence that was given conclusively proves that his death was the result of an over-dose of solution of morphia, administered in all probability whilst partly intoxicated.

Mrs. Wilkes said deceased's name was John Poole; he practised medicine, but she did not know whether he was properly qualified. He succeeded to the practice of her late husband. He went to bed on Wednesday night about half-past eleven, at which time he was slightly intoxicated. As he did not come down at his usual time next morning, his room was entered and he was found dead. The small bottle produced generally stood on the drawers, but on the morning of his death it was on the corner of the dressing-table. On Wednesday morning there was about an ounce of the solution of morphia in it. Deceased had had *delirium tremens* slightly.

Samuel Beecroft deposed that he was a surgeon, practising at Hyde, and had made a *post-mortem* examination of the deceased. There were about eight ounces of fluid in the stomach, but no food; the fluid smelt strongly of whisky. The mucous membrane was much inflamed, probably through the spirit. On making the necessary tests he found distinct evidences of morphia, and had no doubt he died in a state of coma produced by morphia. There would be about 4 grains of morphia, and 1 grain had frequently caused death. Deceased might not think it an overdose.

The Coroner said, there could be no doubt from Mr. Beecroft's testimony and the other evidence given, that deceased died from an overdose of morphia, and that he did not take it for the purpose of destroying himself, but that it was simply an overdose taken incautiously, he being at the time in a state of intoxication.

The jury concurred in the coroner's views, and a verdict was returned accordingly.

Cases of Poisoning by Laudanum.

The *Sunderland Times* reports that an inquest was held on Tuesday, September 3rd, at Millfield, on the body of William Hay. According to the evidence the deceased was found asleep in the taproom of a public-house. Medical assistance was obtained, but death ensued about two hours after. From a *post-mortem* examination, the doctor was of opinion that deceased died from poisoning by laudanum.

An assistant to Mr. Walton, chemist, stated that he had sold to a man, whom he could not identify as deceased, two drachms of laudanum for a penny. The bottle and label were similar to those produced. The man said he wanted the laudanum for his sister, who had a pain in her side. This witness incidentally stated that he had two or three times seen women drink off a pennyworth of laudanum while standing in the shop.

A verdict was returned that the deceased died from poisoning by laudanum, but whether taken intentionally or accidentally there was no evidence to show.

Another case of poisoning by laudanum is reported from Saffron Walden, where Mr. David Archer has taken an overdose which caused his death. Deceased had purchased an ounce of laudanum from Mr. Gilling, chemist, stating that he wanted it for cattle. Shortly after his return home he was found in an unconscious state, and spite of every effort to restore him died, after lingering for some hours. The jury returned a verdict of death from an overdose of laudanum taken by misadventure.

On Monday, October 16th, an inquest was held at Brighton to inquire into the death of Barbara Chapman, a single woman, who was found dead. Evidence was given that the deceased, who was addicted to drink, was in the habit of taking laudanum for the purpose of obtaining sleep. In the room in which she was found there was a bottle labelled "Laudanum—Poison," with the name of Mr. Curtis, chemist, on it. Downstairs was another, similarly labelled, with the name of Mr. Pain on it, and in a workbox another that had been obtained from Mr. Rowsell. Deceased had applied for sixpennyworth of laudanum at Mr. Curtis's, but only one pennyworth had been supplied to her, and the same quantity was supplied to her by Mr. Pain.

Medical evidence was given to the effect that the deceased had died from an overdose of laudanum. The jury returned a verdict accordingly, and expressed an opinion that it had been taken incautiously, without an intention to commit suicide.

Notes and Queries.

*** *In order to facilitate reference, correspondents are requested to mark their answers in each case with the title and number of the query referred to.*

No notice can be taken of anonymous communications. All queries or answers should be accompanied by the name and address of the writer.

A CHEMICAL CURIOSITY.—The potassio-chromic oxalate described in Fownes' 'Chemistry,' p. 778, presents the curious anomaly of being pure deep blue in crystal, claret-red in strong solution, and dusky green when further diluted.

The crystals appear black by reflected light, and the blue is only seen in their thin edges. A solution prepared by dissolving 10 grains of potassium bichromate, 20 grains of oxalic acid, and 20 grains of potassium binoxalate in hot water, and diluted so as to fill a four-ounce white flint square, displays the red colour when seen in the direction of the longer diameter of the bottle, and the green when viewed through the shorter. —J. F. Brown.

[285.]—SYRUPUS CROCI made by form given on page 707 is not very satisfactory; a portion of the sugar remains undissolved at the bottom of the syrup bottle, and the syrup (?) above is in a gelatinous state, so the bottle may be turned upside down and well shaken without the contents leaving. Colour and smell are good, the only fault apparent is that of its being a little too thick.—IOTA.

[286.]—DISPENSING.

℞ Spt. Ammon. Co. ʒss
Liq. Ammon. Acet. ʒij
Quinæ Sulph. gr. x
Liq. Morph. ʒj
Spt. Ether. Nit. ʒiss
Acid. Citric. ʒj
Potass. Bicarb. ʒiss
Mist. Camph. ℥iij
Inf. Gentian. ad ℥vj.
M. ft. mist.
℥j tertia vel 4tis horis.

I should first form citrate of potash, then add the other ingredient and finally the quinine.

The mixture presents a slightly opaque appearance, with crystals of quinine floating about in it, and should therefore be labelled, "Shake the bottle."—W. B. CORDLEY.

[It would be better to powder the quinine slightly before adding it to the mixture. The following we find yields a more satisfactory result, as the quinine is held in solution.—ED. PHARM. JOURN.]

Appearance a bright orange-straw colour.

℞ Quiniæ Sulph. gr. x
Acid. Citric. ʒj
Mist. Camph. ℥iij.

℞ Potass. Bicarb. ʒiss
Inf. Gentian. ℥ij et ℥iij.
Mix. After effervescence, add:
Spt. Ammon. Co. ʒss.
Liq. Ammon. Acet. ʒij
Liq. Morph. ʒj
Spt. Ether. Nit. ʒiss.

—C. H. SNELL.

[287.]—HOTCHKISS' OIL OF PEPPERMINT.—Your correspondent "*Philos*" is labouring under a difficulty, the counterpart of which I have for a long time experienced. Like himself, I was a few years ago able to buy Hotchkiss' ol. m. pip. which was perfectly soluble in sp. vin. rect. 56 o. p., one part to seven. I now use sp. vin. rect. 60 o. p., but still have the result he complains of, viz. a milky fluid, which no kind or extent of paper filtering will clear. When first made, and for a considerable time after, the mixture is unsaleable; but in the course of four or five months it loses, in some degree, its turbidity, and becomes comparatively clear, depositing on the sides and bottom of the vessel in which it is made a dirty precipitate. I have hitherto been unable to find out any other means of getting over the difficulty, except by making my stock of ess. menth. pip. some six months before it is wanted.—F. R. B.

I find that the oil of peppermint manufactured by L. B. Hotchkiss will become milky if mixed with more than an equal volume of S. V. R. 56 o. p.; but the mixture becomes clear if kept for a few days, and a kind of resin is deposited. I should like to know if any of our fellow readers can tell us what this resin is; if it is used as an adulteration, or is an impurity in the oil.—FERRUM.

My experience coincides with that of "*Philos.*" Hotchkiss' ol. m. pip. did formerly dissolve at once in sp. vin. rect. For a long time it has not done so. If "*Philos*" will put the turbid liquid by for a fortnight, it will clear itself; or if a little magnes. carb. is added to it, the effect will be much expedited.—IOTA.

The milkiness complained of upon mixing the oil with sp. vin. rect. 56 o. p. is entirely removed by adding a little magnesia, shaking it occasionally for a few days, and then filtering.—J. W. HADINGHAM.

S. P. Z. R. suggests the same remedy.

[290.]—MILDEW.—"*Primus*" asks to be informed of an effectual remedy for mildew.

[291.]—GOLDEN INK.—Will any correspondent oblige me with a receipt for golden ink, which is used for gilding, writing, etc.?—SENEGA.

[292.]—ZINCI OXID. BENZOAS.—Can you furnish me with a form for making zinci oxid. benzoas?—A. A.

[293.]—DISPENSING.—Will some of your readers inform me how they would dispense the following prescription?

British Pharmacopœia.

℞ Potassæ Chloratis, 2 oz.
Aquæ, 18 fl. oz.
Tinct. Aurantii, 12 fl. drs.
Tinct. Cinchonæ Flavæ Liquid. 4 fl. drs.

Mix and label two small tablespoonfuls with the same quantity of water twice a day, 10 A.M. and 8 P.M.
—X. Y. Z.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

PROVINCIAL EDUCATION.

Sir,—Mr. Smith's thoughtful and suggestive paper forms an excellent groundwork for discussing the important and too-long neglected question of provincial education. For a long period of years provincials have contributed largely to the educational establishment in Bloomsbury Square, without receiving or expecting any very direct benefit in return. Mr. Mackay, in his address, remarked that as an educating body its days were probably numbered; and, however startling the prophecy may be, there is little doubt of its truth, such a result being a natural sequence of the legislation of 1868.

In the face of such a probability, it is the plain duty of the Council to encourage by every means in their power the establishment and development of schools of pharmacy throughout the provinces, and provided no parliamentary ghost appears, much may be accomplished in a year or two.

A few provincial schools have been started,—I fear it can hardly be said established,—each groping its own way, but as yet making little real progress, mainly for want of a directing power at the helm. I trust the able letter of Mr. Smith, and the discussion arising thereon, will lead to a better state of things.

The sectional arrangement of Mr. Smith accords exactly with that adopted by our Hull Association two or three years ago. We do not, however, disregard the education of assistants, but admit them on equal terms with apprentices, for in many cases they need our sympathy, having unexpectedly to undergo an examination not contemplated when they entered the trade. We also allow them to compete for senior prizes.

I think all will agree that the management of provincial schools must of necessity be in the hands of local associations, assisted, if need be, by liberal grants from the parent society; the grants at present made are not only small in amount, but clogged with such conditions as to rob them of half their value. A very small portion of the large funds of the Society, judiciously and generously applied, would greatly stimulate local efforts, and that to an extent far beyond the mere money value of the grant.

From a long experience in national and other schools, I can affirm the value of independent periodical examinations in maintaining the tone of a school, and I trust that Mr. Smith's suggestion will not be lost sight of. Centres of examination are also desirable.

Schools, however, must of necessity precede examiners; it appears to me, therefore, that immediate steps should be taken to establish, in all large towns at least, efficient schools of pharmacy, each working in harmony with a general plan approved or arranged by the Council, yet sufficiently elastic to admit of ready adaptation to the wants of various localities.

My own experience leads me to the conclusion that the Pharmacy Act is not popular among country chemists; they are therefore, in many cases, indifferent to the claims made upon them for education, and the work and cost falls upon comparatively a small number of the body. Under these circumstances, if the Council expects the schools to succeed, both moral and material aid must be offered, for a time at least, to those willing to engage in the work.

In Hull we have made a fair start in the matter of technical education, but I am satisfied we shall not succeed in permanently establishing our school of pharmacy without a liberal subsidy from the parent Society. So far we have gone on in the expectation something would be done, and I would fain hope the good time is now coming.

There are other parts of Mr. Smith's letter I should like to comment upon, but consideration for your space forbids at present.

JAMES BAYNES.

Hull, Oct. 17th, 1871.

Sir,—Mr. Edward Smith, in his paper on "Provincial Education," which appeared in last week's Journal, divides his subject into three heads,—the students, their studies, their teachers. To his definition of the first, and his proposed line of action for the third, I would heartily agree, but must to some extent differ with him on the second head. He would, if I rightly interpret his idea, make it the great object of country associations to prepare students for the Minor. Working on this principle, they will soon degenerate into copies of those London establishments which guarantee to prepare gentlemen for their examinations in one month; and of those thus prepared, or rather "crammed," with lists of names and crude facts which just enable them to squeeze through the Minor, how many will care (without the Association's help too) to thoroughly master the several subjects of study, and go on to the Major? That the cram system is that desired by most of the apprentices I readily admit, but cannot think that it is the proper one. Let the course of study undertaken be thorough, without reference to any examination, and though the way be thus made a little longer, the student will find that, instead of crossing the Minor on a tottering plank, which lands him on the other side in a pathless forest, he will cross by a good stone bridge, from which a well-macadamized road, along which he can travel with ease, leads straight to the Major.

Norwich, October 16th. PHILIP H. MASON.

THE COUNCIL OF THE NORTH BRITISH BRANCH OF THE PHARMACEUTICAL SOCIETY.

Sir,—Having been out of reach of the Journal for a few weeks, I have been unable to draw attention so soon as I would have liked to Mr. Mackay's reply to my letter of the 26th August. In that reply, he says "That the name (North British Branch) was given by Jacob Bell; that it has remained unchallenged for nineteen years;" and "that it became necessary that a committee should be appointed to look after the various matters in connection with the examining board." "These gentlemen," he says, "formed, and still form, the Council at Edinburgh." May I ask, if Mr. Bell bestowed the title "North British Branch," why they did not adhere to it during all these nineteen years which Mr. Mackay boasts so much about? On reading Mr. Mackay's statement I was convinced that there was a discrepancy somewhere, and to satisfy myself, as well as to take advantage of the advice tendered by Mr. Mackay, I went over a few of the back volumes of the Journal, and found, as I expected, that the title "North British Branch" was not adopted until 1869. I find that on the evening of Friday, 17th April, 1868, the "Edinburgh Pharmaceutical Society" held their annual meeting, Mr. Young, President, in the chair, and, amongst other business, Mr. Ainslie was elected President. Then, in the 1869–70 volume, I find the report of the annual meeting of the "North British Branch" of the Pharmaceutical Society, held in Slaney's Douglass Hotel, on Thursday evening, May 27th, 1869, Mr. Ainslie, President, in the chair. When was Mr. Ainslie elected President of the "North British Branch," and when was the high-sounding title adopted originally? Of this we have no record, in the Journal at least, though it doubtless exists in Mr. Mackay's brain. Then, again, if Mr. Bell really gave it the high-sounding title years ago, does Mr. Mackay mean to insinuate that it was his intention that his elected few should keep the title exclusively to themselves, and remain in office for life. But perhaps our Edinburgh friends will go a step further and hand the title down to the third and fourth generation. I think, however, this was not Mr. Bell's intention; from what I have learned of him, he was too open-hearted a gentleman to give occasion for any such notion, and if he did say that a North British Branch should be started, he meant that it should exist on the same footing as the London Council, at least that all members of the Society in Scotland should have a voice in the election of the Council in Edinburgh, and if, as Mr. Mackay says, they have no power to do so, let them take the power. If they had adopted a constitution for themselves, and made a small fee, say of 5*s*. a year, for the title of membership; then no one could object to them using the title "North British" or any other they chose. As it is, they are certainly in an anomalous and unenviable position, in their using such a high-sounding title, and, at the same time, retaining all the privileges and advantages to themselves. Mr. Mackay says, that if the members in Scotland claim a right to elect the Council, so will the English members; but I do not see it in that light, what was the use of legislating, specially for Scotland, if she was not to have exclusive rights? More especially when everything done by the "North British Branch" is under veto of the London Council.

But apart from the question of the Edinburgh Council, I would ask, is it advancing the interest and raising the standard of the pharmacist to put up special pharmaceutical preparations and push their sale amongst grocers, hucksters, etc., enabling them to undersell the legitimate vender, or to reduce the prices for dispensing to such a low scale that it is really a wonder that a Pharmaceutical Chemist exists in the west of Scotland at all? Some of the most prominent members of this Council do this, belonging both to Edinburgh and Glasgow, and I can only say shame to them and their boasted position of leaders of the Pharmaceutical Society of North Britain.

October 10th, 1871. M. P. S.

TINCTURE PRESSES.

Sir,—I fear Mr. Staples has misconstrued my letter upon tincture presses, published in your issue of October 7th, 1871.

I there intended to show that the power of the one-gallon tincture press, "as ordinarily met with in trade," was not 20 tons, as represented by him in his paper read before the Pharmaceutical Conference, but theoretically only $4\frac{3}{4}$ tons; and when the deduction was made for friction about 2 tons.

Upon the press designed by Mr. Staples I did not comment.

It seems that Mr. Staples' calculations were based upon data (as far as dimensions were concerned) the accuracy of which he had not previously ascertained, whereas my calculations were framed from actual observation in the druggists' sundriesmen's warehouses in this city. The only other difference influencing the computation was the force applied at the extremity of the lever.

I imagine that although your readers (myself included) look upon Mohr and Redwood's 'Pharmacy' as a standard work upon all that is practical in connection with our calling, still they would not take everything as there stated (and especially when upon a subject that more properly belongs to the engineer) as an indisputable fact. My authority was Professor Rankine, whose writings are considered by practical engineers as standard works.

Mr. Staples, I have no doubt, read in your last issue a letter from the eminent hydraulic engineers, Messrs. Hayward Tyler and Co. In introducing their combined screw and hydraulic press, they compute a man's power at the end of the tincture press lever as equal practically to *fifty* pounds. Surely they would not have taken the force applied as equivalent to fifty pounds only, had *one hundred pounds* been the actual power that could be used, for thereby they would have undervalued the power of a machine, the superiority of which over the screw tincture press they wished to show.

In conclusion, I beg to assure Mr. Staples that nothing was further from my intention than the "courteous sarcasm" for which he gives me credit.

Laboratory, 40, *Aldersgate Street.* CHAS. UMNEY.

Sir,—When last week I wrote my reply to Mr. Umney, I had never computed the power of my own press. I was so satisfied at having obtained an implement that did its work well without much labour, yet so effectually that the marc appears as if dried, rather than only pressed, that I never troubled myself with any useless calculations about it, for they are but theoretical although giving a proximate estimate of mechanical force. The result led me to suppose that I had increased the power, but I never knew to what extent until Mr. Umney's criticism (PHARM. JOURN. October 7th) induced me to measure and calculate it. I now beg most cordially to thank that gentleman for teaching me its value, for I am really astounded to find how far it surpasses that of the press in general use. In my original paper on the tincture-press (*vide* PHARM. JOURN. September 9th) I supposed one yielding a theoretical pressure of nearly twenty tons. 100 lb. power being multiplied over 400 times, the figures were merely assumed for the convenience of illustration, as there stated. Now I learn from Mr. Umney that in practice these implements are manufactured with such huge bulk of screw that the calculation only works out to about half this result. If then my estimate of twenty tons (theoretical) pressure from a good screw-press of the ordinary construction is so exaggerated, what will be said of the power of my press? I feel some diffidence, almost hesitate to quote the figures, for fear that some of your readers, not working out the calculation, may think them fabulous; figures, however, like facts, are stubborn things. My press has two screws, the threads are one-eighth of an inch, with levers of seven inches radius, consequently each screw multiplies the power $7 \times 6 \times 8 = 336$ times. As to the power, with all respect for Mr. Umney's opinion, yet guided by that best of all teachers, my own experience, aided by the experience of others with whom I have conversed, also by the excellent authority of Professor Redwood ('Practical Pharmacy,' p. 107), I continue to average at 100 lb., this would give a total for both screws of $336 \times 100 \times 2 = 67{,}200$ lb., or *thirty tons!*

Now, if this result is obtained from an implement rudely constructed as a working-model, what may we expect from one of superior workmanship, with a further multiplication of power, which could be most effectually obtained by reducing the screw-thread, and as this would also diminish friction, a double benefit would be obtained? In my paper (PHARM. JOURN., September 9) I explained why it is impracticable to reduce the size of the screw in the ordinary press; but in mine it can be safely reduced to any reasonable extent. No amount of power so applied can injure it, provided the cross-bar is kept in a nearly horizontal position by a turn or two of each screw alternately. We will suppose a press, constructed on my model, with a pair of highly-finished steel screws, with threads one-twelfth of an inch, which should be cut deep into the rod so as to present an angle more acute than usual, say about 45°, with levers of 8 inches radius; this would multiply the power over a thousand times ($8 \times 6 \times 12 = 576$ for each screw), giving, with 100 lb., a theoretical pressure with greatly reduced friction of over *fifty tons!* Such an implement would be convenient, portable and not expensive, yet giving a magnificent power, fully up to the requirements of the pharmaceutical laboratory, even if it did not entirely supersede the hydraulic and all other presses; but these figures are but theoretical. Now, I am a practical man, and would rather have a thing done than talked about; perhaps one of your readers now wanting a good screw-press will have one made as I suggest (I know it would prove a most profitable investment), and then put it to the test; let a gallon, say of tincture of orange peel, be made for actual use and pressed by it, and another gallon made at the same time and under similar circumstances be pressed off by the best screw-press that can be obtained of the ordinary construction, and note the result, the measure of product in each case, weight of marc, also time, labour and trouble. This would be of more value than all the theoretical calculations or anything that could be said or written about it for the next twelve months.

October 16*th*, 1871. C. A. STAPLES.

E. H. S.—(1.) Pulvis Tragacanthæ Compositus is undoubtedly intended. (2.) Ferrocyanide of Potassium is not a "poison" under either schedule of the Pharmacy Act, 1868.

T. B.—Wanklyn and Chapman's 'Water Analysis' (Trübner).

J. B. B.—See a series of articles on the Cultivation of Medicinal Plants at Hitchin, PHARM. JOURN., 2nd Series, Vol. I. pp. 275, 323, 414, 515. Also an article on the Cultivation of Medicinal Plants at Mitcham, PHARM. JOURN., 2nd Series, Vol. VI. p. 256.

"*A Minor Associate.*"—(1.) Ung. Plumbi Subacet. Co. made as you state, does change from a yellowish colour at first to a white, and it afterwards assumes a bluish tint on the surface, but will be found white below. If made with almond oil, the ointment also soon gets a surface coating of an orange colour. We are unable to explain the causes of these discolorations. As the ointment quickly becomes rancid, it should not be kept long prepared. (2.) Camphor is destructive to some parasitic growths, but that it has any further action as a "disinfectant" we very much doubt. (3.) Bran does contain albuminous matter, phosphates, etc., which are soluble to some extent when taken as food, but its action is generally considered to be mechanical. (4.) "Species" should be translated "species." You might label the ingredients "species for infusion."

"*A West-End Chemist's*" letter is too personal for insertion. Would it not be better for him to inquire from the firm referred to what they really did charge?

L. S.—To make ten pills, the prescription sent may be readily dispensed thus:—

℞. Quin. Sulph. et P. Zingib. ana gr. x
Ferri Sulph. Exsic. gr. vj (=gr. x of crystals)
Ol. Menth. ♏x.

Adde: P. Trag. Co. gr. iij.
Syrupi Simp. ♏x.

Rub the sulphates to a fine powder; add the other dry ingredients and the oil; lastly, the syrup. Mix well, and roll out quickly.

"*Sempervirens*" (Ryde).—(1.) *Epilobium hirsutum.* (2.) *Mentha aquatica.*

G. B.—*Milium effusum.* The specimen was much broken.

J. Robbins (Bath).—Dr. Tilden's "Notes to the Pharmacopœia" were commenced in this Journal, 2nd Series, Vol. XI. p. 654.

R. A.—Dissolve the gallic acid in the aqua camph. made warm. Clear.

"*Vectis.*"—We agree, to some extent, with the opinion expressed in your letter, but think that its publication would be prejudicial to a matter of wider importance than that referred to.

"*One who has Passed Fairly*" should address the Secretary on the subject referred to in his letter.

J. H. D.—We should think such a person would be liable under the Medical Act as an unqualified person.

J. W. Lasham.—Exemption from the duties referred to cannot be claimed.

J. Robbins (London).—The communication acknowledged in last week's journal was from another Mr. Robbins.

W. F. Caunt.—Elixir Proprietatis = Tinct. Aloes Comp. of the old London Pharmacopœia.

The following journals have been received:—The 'British Medical Journal,' Oct. 14; the 'Medical Times and Gazette,' Oct. 14; the 'Lancet,' Oct. 14; the 'Medical Press and Circular,' Oct. 18; 'Nature,' Oct. 12; the 'Chemical News,' Oct. 14; 'English Mechanic,' Oct. 13; 'Gardeners' Chronicle,' Oct. 14; the 'Grocer,' Oct. 14; the 'Journal of the Society of Arts,' Oct. 14; the 'Brewers' Guardian,' Oct. 15; 'New York Druggists' Circular' for October; 'Brighton Daily News;' 'Canadian Pharmaceutical Journal' for October.

COMMUNICATIONS, LETTERS, etc., have been received from T. Small, E. Agnew, R. Chubb, J. Abbott, A. Williams, J. Bairnsfather, Barnsley (Brazil), A. B. Daniell, W. M. Betts, J. T. Robinson, J. B. Barnes, T. A. S., X. Y. Z., "Give and Take."

CHLORAL.

BY W. A. TILDEN, D.SC., F.C.S.

A little more than two years ago the notice of the world was drawn to the remarkable physiological action of a substance, which at that time had probably been not even seen by more than a few individuals, and of which the quantity then in existence might be estimated by ounces.

At present it is bought and sold by hundreds of pounds.

In consequence of its production upon so large a scale, and of having become, in so pure a form, a regular article of commerce, chloral has latterly received from chemists a very considerable share of attention. Apart from considerations connected with its employment in medicine, a body of characters so singular deserved that its chemical history should be studied more closely than had hitherto been the case.

Experiments upon chloral, upon its hydrate, and upon other bodies more or less nearly related to it, have multiplied. Most of them are, however, of comparatively recent date, and are consequently not yet to be found in books.

Manufacture.—As every one knows chloral is made by passing chlorine gas into alcohol, mixing the product with oil of vitriol and rectifying. But the number of precautions to be taken to ensure a successful result, can only be properly appreciated after experience in the operation. The main points to attend to are, it seems, two:—the chlorine and the alcohol must both be absolutely free from moisture, and the current of chlorine gas must be maintained slowly but continuously from beginning to end. The chlorine is rapidly absorbed at first by the alcohol, but after a time it is necessary to heat the spirit until towards the close of the operation it boils. This must of course be done in an apparatus connected with a proper condensing arrangement, that the volatilized portions may not be lost. A yellow liquid ultimately results, which is agitated with oil of vitriol; the lighter part is separated and rectified from some fresh acid. The resulting anhydrous chloral is finally distilled from some quicklime, to remove hydrochloric acid, and then converted into the hydrate by mixing with the theoretical proportion of water.

It is necessary to exclude water from the materials employed, from the fact that chlorine in presence of water acts upon organic bodies, not by substituting itself for their hydrogen, but by oxidizing them. Consequently, when water is present, the aldehyd and acetic acid that are usually unavoidably produced in small quantity become the chief results of the reaction.

It appears that alcoholate of chloral is the immediate offspring of the action of the chlorine, and that from this chloral is set free by the sulphuric acid afterwards used. Water is, however, certainly formed in small quantity by a secondary action, and therefore a little hydrate is probably present as well.

Theory of the Process.—There can be little doubt that the chloral results from the removal of two atoms of hydrogen from the alcohol with production of aldehyd, and the conversion of this body into chloral by the replacement of three of its atoms of hydrogen by three chlorine atoms. Of course, a large quantity of hydrochloric acid results simultaneously.

$$\text{I. } \underset{\text{Alcohol.}}{C_2H_6O} + Cl_2 = \underset{\text{Aldehyd.}}{C_2H_4O} + 2HCl.$$

$$\text{II. } \underset{\text{Aldehyd.}}{C_2H_4O} + 3Cl_2 = \underset{\text{Chloral.}}{C_2HCl_3O} + 3HCl.$$

And it is interesting to observe in connection with this, that from aldehyd itself chloral is obtainable by the action of chlorine, if precautions are taken to remove the hydrochloric acid as it is produced.

Chloral, however, is not by any means the only resultant of the reaction of chlorine upon alcohol. The subordinate interchanges which go on at the same time are complicated, and result mainly from two causes, one the influence of the hydrochloric acid generated, and the other that of the chlorine, which affects, on the one hand, the matters to which the action of the hydrochloric acid gives birth, and on the other hand the impurities in the spirit. These must be examined separately.

The action of the hydrochloric acid upon the unaltered alcohol gives rise to the formation of hydrochloric ether or chloride of ethyl.

$$\underset{\text{Alcohol.}}{C_2H_5HO} + HCl = \underset{\text{Ethyl Chloride.}}{C_2H_5Cl} + H_2O.$$

But hydrochloric acid, in the absence of water, or even in concentrated solution, is a powerful promoter of what is called condensation. It does this by taking from two or more molecules of a compound body the elements of water, the residues of those two molecules uniting into one.

In a great deal of the spirit employed on the Continent in this manufacture aldehyd already exists in appreciable amount, and from this is formed a curious substance, which has been repeatedly observed and minutely examined. It is crotonic chloral, a body which stands in the same relationship to crotonic aldehyd that ordinary chloral does to acetic aldehyd. It is formed in this way:—From two molecules of aldehyd a molecule of water is detached by the hydrochloric acid. This gives crotonic aldehyd, which, at the moment of its formation, is attacked by the chlorine passing through the liquid, and converted into the new chloral.

$$\underset{\text{Aldehyd.}}{2(C_2H_4O)} - H_2O = \underset{\text{Crotonic Aldehyd.}}{C_4H_6O}$$

$$\text{and } \underset{\text{Crotonic Aldehyd.}}{C_4H_6O} + 3Cl_2 = \underset{\text{Crotonic Chloral.}}{C_4H_3Cl_3O} + 3HCl.$$

It is possibly by an analogous reaction that the small quantities of ether which it is believed are formed in the process may also result. This is, however, open to question.

The foreign substances which occur in spirit of wine are very numerous.

Water.—Although but minute quantities are present in the alcohol to start with, the amount, as already explained, is liable to increase. To this cause is due the production of acetic acid.

$$\underset{\text{Alcohol.}}{C_2H_6O} + OH_2 + Cl_2 = \underset{\text{Acetic Acid.}}{C_2H_4O_2} + 2HCl.$$

Fousel Oil.—This name is applied to the mixture of alcohols of higher boiling-point than ordinary alcohol, which is separated from spirit by the process of rectification. Propylic, butylic, amylic alcohols, and the corresponding iso-alcohols are among the constituents of this complex mixture, which have been observed. Acted upon by chlorine they probably yield products analogous to those formed from ordinary ethylic alcohol, but inasmuch as they are present in only small amount, they do not interfere seriously with the production of chloral.

Aldehyd.—This has already been mentioned as the source in foreign spirit of crotonic chloral.

As concomitants of the chloral we have then already chloride of ethyl, crotonic chloral, acetic acid, ether (?), and the numerous compounds derived from the fousel oils. But this is not all. These substances are, most of them, susceptible in their turn of the substituting action of chlorine. Thus from chloride of ethyl may be formed the following series:—

Ethyl Chloride . . .	C_2H_5Cl.
Monochlorinated " " . . .	$C_2H_4Cl_2$.
Dichlorinated " " . . .	$C_2H_3Cl_3$.
Trichlorinated " " . . .	$C_2H_2Cl_4$.
Tetrachlorinated " " . . .	C_2HCl_5.
Pentachlorinated " " . . .	C_2Cl_6.

From ether a similar series results, and probably all the other compounds referred to as originating in the fousel oils, yield by the same action at least one chloro-substitution product.

(*To be continued.*)

THE ESTIMATION OF COLOUR IN LIQUIDS.

BY BOVERTON REDWOOD, F.C.S.

Secretary and Consulting Chemist to the Petroleum Association.

It occasionally happens that the estimation of the amount of colour in a liquid is an operation of considerable importance. The following remarks have special reference to a notable instance of this afforded in the case of refined petroleum, the commercial value of which is to a great extent dependent upon its colour; since, however, they are in the main applicable to many other cases of a similar nature, not only in technical, but also in scientific chemistry, they may be considered to be of general interest.

The colour of refined petroleum has usually been measured by comparison with samples kept as arbitrary standards; such standard samples being in this country commonly contained in glass bottles of the ordinary form, and about 8 inches in height, while in America square bottles are preferred. The first difficulty in this mode of operating to which reference may be made, arises from the liability of the standard samples to change colour, and this is but imperfectly overcome by keeping the samples protected from the action of light. The Americans have, however, provided a remedy, which consists in the use of stained glass bottles, which, when empty, are the same colour as "white glass" bottles filled with the standards. This ingenious device is nevertheless no remedy for the next difficulty which lies in the fact that in cases of dispute, which not unfrequently occur between buyers and sellers, the system of comparing in bottles is not found to be sufficiently delicate; and opinions frequently differ as to whether a certain sample is equal to the standard or not, especially when the samples are observed against a clear sky, the blue colour of the firmament forming a bad background. The obvious way out of this dilemma was to employ a larger body of liquid, and Letheby's water-tubes, long test-tubes, or tall hydrometer-glasses held over a white plate or sheet of paper, have been used to contain the samples. The fluorescence of the liquid, however, prevented this mode of procedure from being as applicable as in the case of potable waters, for instance; and although the fluorescent appearance may be got rid of by coating the sides of the vessels with some opaque material, the plan hardly answered better than that of comparing the samples in bottles, until it occurred to Mr. R. P. Wilson (London), who with the writer was engaged in the determination of the colour of certain specimens of petroleum, to place a mirror beneath the tubes as a substitute for the white plate. It was at once evident that this constituted a great improvement, for instead of having to look down the two tubes alternately, it was merely necessary to glance at the mirror, where two well-defined discs of colour corresponding to the colour of the liquids appeared in juxtaposition convenient for comparison. Mr. Wilson was, however, not content with this arrangement, which was still subject to the objection attaching to the use of a liquid standard, but elaborated the idea until he produced the apparatus of which the following is a description, and which he has since patented.

The invention, which Mr. Wilson terms a chromometer, consists of two tubes of equal length (those used in the examination of petroleum being preferably of glass 16 inches long by $\frac{7}{8}$ inch internal diameter, and encased in brass tubing), marked *a a* in figs. 1 and 2, attached side by side to the hinged lid of the box which encloses them when the apparatus

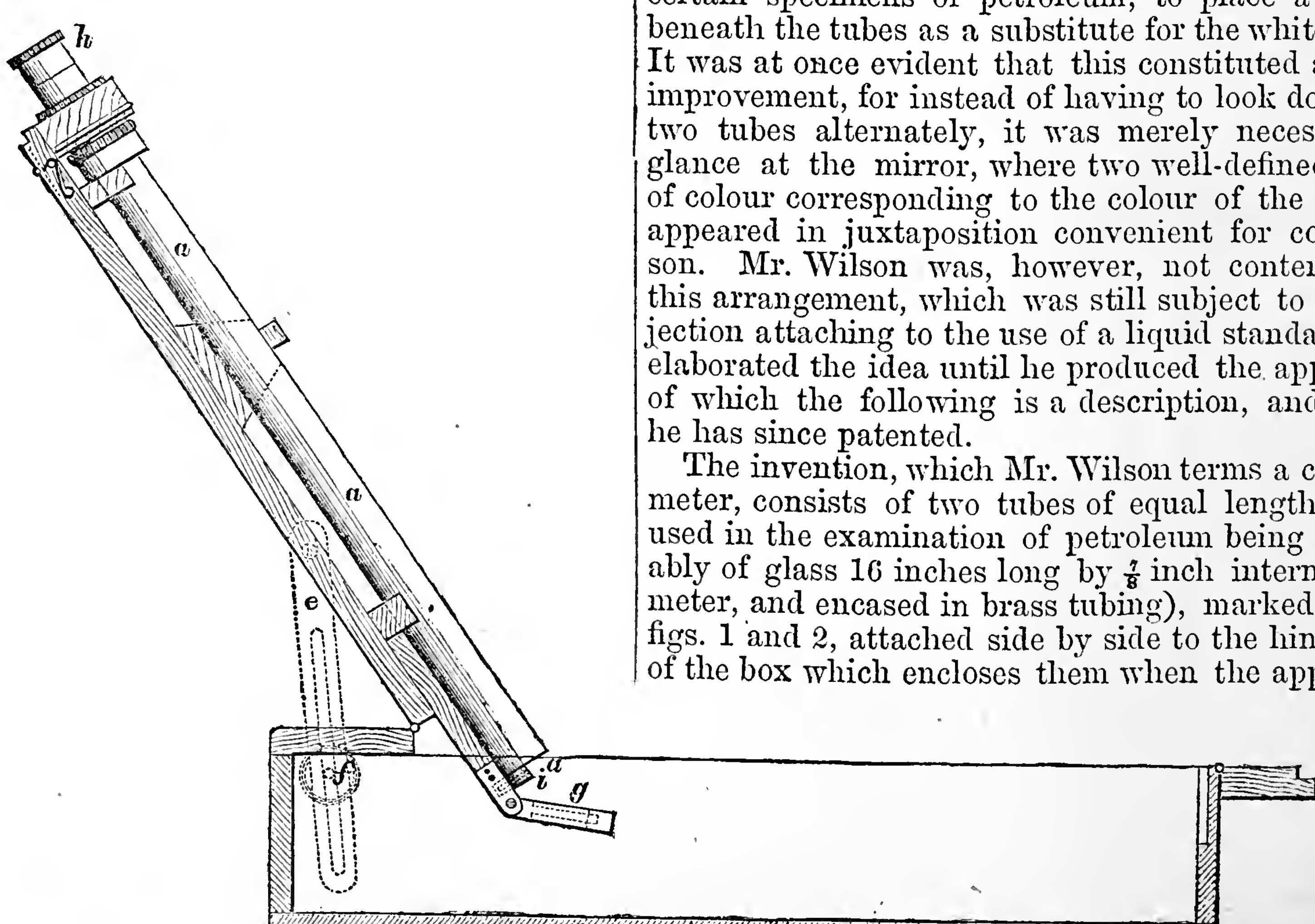

Fig. 1.

is not in use. The tubes are provided at both ends with screw-caps or end-pieces with glass centres (the caps at the lower ends being merely for convenience of cleaning), or the lower ends may be closed with circular plates of glass cemented on; and as it is essential to the proper transmission of light that the tubes shall be quite filled with liquid, the end-pieces are constructed as shown in fig. 2, where they are

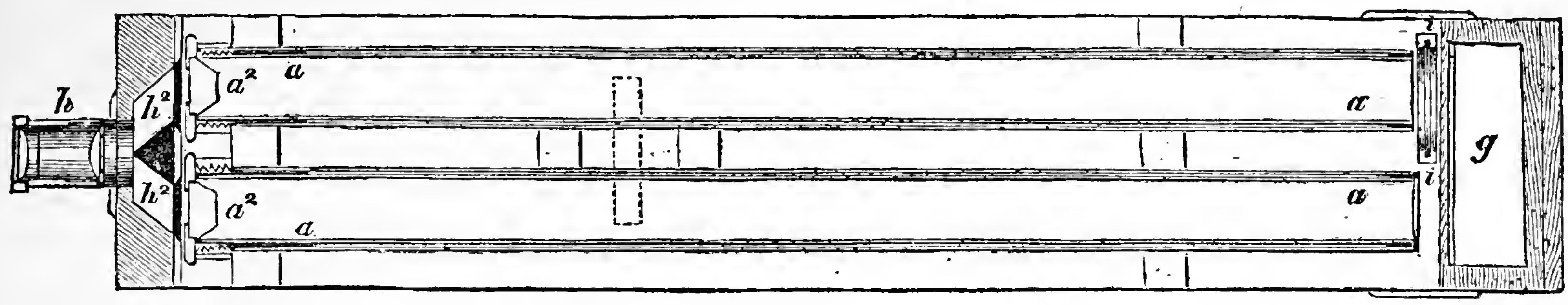

Fig. 2.

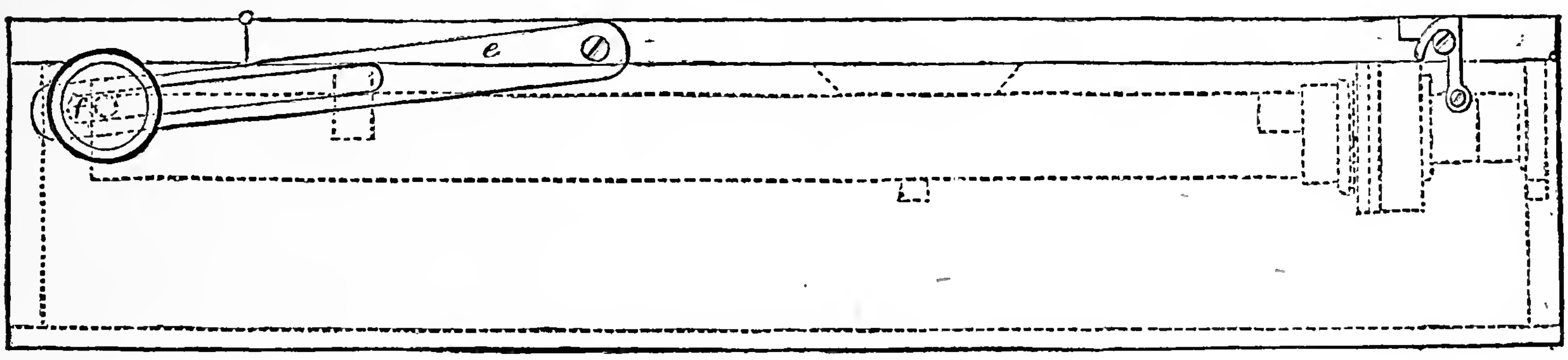

Fig. 3.

marked a^2 a^2, and where it will be observed that the glass centres are of considerable thickness. With this arrangement it results that any small quantity of air remaining in the tubes after they have been filled with liquid, must be displaced by the glass centres and forced to occupy the space round the bevelled edges of such glasses where its presence can cause no inconvenience. At the lower end of the tubes a small mirror *g* (figs. 1 and 2) is hinged

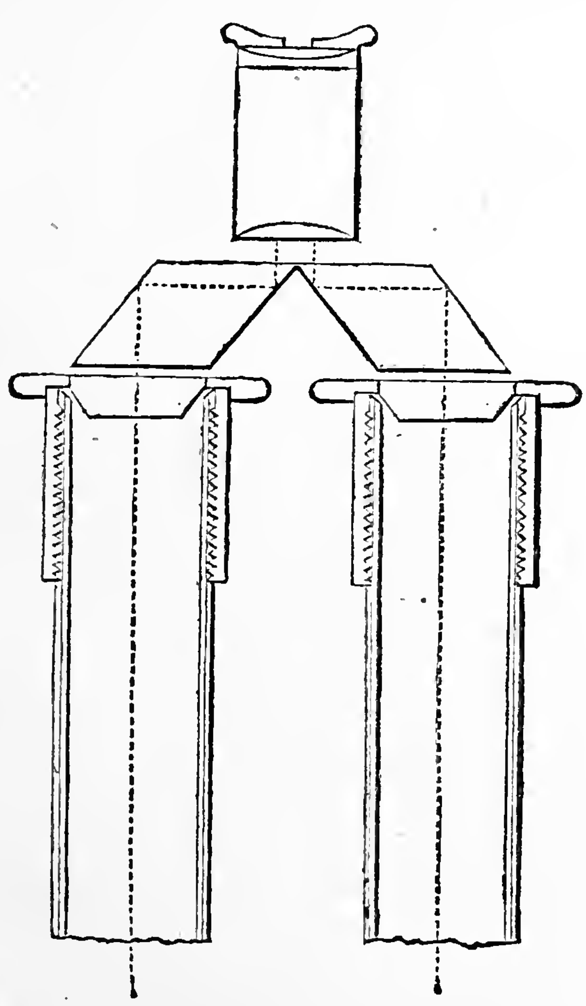

Fig. 4.

to the lid of the box, and at the opposite end is attached in similar manner an optical arrangement consisting as shown in figs. 2 and 4 of two double prisms, and an eye-piece (the eye-piece and prisms being marked in fig. 2, *h* and h^2 respectively).

So much in reference to the principal features of the apparatus which, as shown in fig. 3, appears when not in use as a box 20 inches by 5 inches by $4\frac{1}{2}$ inches, and is therefore portable and not liable to injury. Now for the mode of using it.

We will, in the first instance, suppose that our standards, with which we wish to compare certain samples, are liquid; accordingly we open the lid of the box, adjusting it at an angle of about 45°, by means of the link and set-screw *e f* (figs. 1 and 3) and place the apparatus so that the mirror *g* may receive the light through a window direct from the sky. We then fill either of the tubes with one of our standards, and the other tube with one of our samples; and applying an eye to the lens, we adjust the mirror so as to obtain the greatest amount of illumination. The rays of light reflected from the mirror take the course shown by the dotted lines in fig. 4, and we now observe in the lens a circular field divided down the centre by a perpendicular line. The tint of each semicircle corresponds to the colour of the liquid in the tube beneath it; and it is clear that we have here a means of comparing with great convenience and accuracy the two shades of colour. But, as has already been stated, the use of a liquid standard, at any rate in the case of petroleum, is open to objections; and Mr. Wilson has accordingly procured discs of stained glass about an inch in diameter, which when placed in the grooved holder *i* (figs. 1 and 2), the tube above being of course empty, produce exactly the same coloration of the corresponding side of the field, as if the tube were filled with the standard represented by the disc. The apparatus having been adopted by the Petroleum Association, discs have already been made, corresponding in colour to the standards of the Association, and petroleum standards of colour may now be carried in the pocket like so many halfpence.

As remarked at the commencement, this article refers particularly to petroleum, the desirability of having a better means of estimating the colour of this liquid having led to the invention; but the apparatus is without doubt capable of application in indicating the colour of potable waters (longer tubes being made use of), and in many other similar cases which will present themselves to the mind of the practical chemist.

85, *Gracechurch Street, London, E.C.*

EXPERIMENTS MADE FOR THE PURPOSE OF PRESERVING RAW MEAT.

BY DR. BAUDET.

Since I had obtained, by a lengthy practice, some considerable experience as regards the antiseptic and preservative properties of a substance which I term *spyrol* (carbolic acid), for being applied to the tanning, tawing and currying operations, I felt induced to try some experiments as regards the use of that body for the preservation of meat.

First process: *By immersion in phenic water at from* 5-10,000 *to* 1-1000.—On the 18th of October last year I took four wide-mouthed stoppered bottles, and placed in each 250 grms. of raw horseflesh, slightly moistened with phenicated water in the following proportions:—No. 1, solution at 4-1000; No. 2, solution at 3-1000; No. 3, solution at 2-1000; No. 4, solution at 1-1000. To the contents of every bottle I added a few small pieces of well-burnt charcoal, with the view to absorb any gaseous matter which might be evolved from the meat; after having hermetically closed the bottles, I have kept these for thirteen weeks in a room constantly heated at from 15° to 20° C. On inspecting the bottles after the lapse of time just mentioned, I found that the liquid which covers the meat had in all bottles become slightly rose-red coloured. The state of the meat, on examining it, was found as follows:—No. 1. The meat had become somewhat blackish-coloured, but was not spoiled at all. No. 2. Meat very well preserved, colour light rose-red. No. 3. Meat perfectly well kept, with the natural colour of fresh meat. No. 4. Meat has quite well kept; its colour has greatly improved, considering that raw horse-flesh is naturally deep-coloured. A few days after having inspected and noted down, as described, the contents of each bottle, I have taken a portion of the meat of No. 3 bottle, and, without having it washed or drained, have fried it, and dressed as a beefsteak; on partaking of it, in company with several other parties, we found the meat excellent, having only acquired a slight taste similar to that of cured ham and bacon, but by no means disagreeable. I have kept at the same temperature as indicated above, and under the same conditions, the meat in the bottles, well-closed, and have not observed, up to the middle of February last, any other change in the meat than an external drying and shrivelling up, and deeper colour, but internally the natural colour remains. From the foregoing experiments I conclude that phenicated water in the proportion of from 1-1000 to even 5-10,000, might be applied to keep raw meat fresh and sweet, without imparting to it either any perceptible smell or taste, provided the meat be kept in well-closed vessels, be they casks, tinned iron canisters, or other vessels.

Second process: *By means of vegetable charcoal coarsely broken up, and saturated with phenicated water at from* 5-10,000 *to* 1-1000.—This process is applied as follows:—I cover the meat with a thin woven fabric, in order to avoid its direct contact with the charcoal, which might penetrate into the fibre of the meat, which is placed next into barrels, care being taken to place therein first a layer of the phenicated charcoal, then a layer of meat, and so on alternately, until the barrel is quite filled, and all interstices properly taken up by the charcoal. As regards the importation of raw meat preserved by this method, from South America, I would suggest that the meat, first covered with any thinly-woven fabric, be placed in bags made of raw caoutchouc, very abundantly obtainable in the country alluded to; so that the importation of raw meat and the importation of caoutchouc might go, as it were, hand in hand. The mode of filling in alternate layers of phenicated charcoal and meat would, of course, remain the same; and there would be no difficulty of hermetically sealing up bags made of caoutchouc, either by soldering the seams together, or by placing a cap of caoutchouc over the mouth of the bag, and soldering the cap on hermetically.—*The Drug. Circular and Chem. Gaz., August,* 1871, from *Moniteur Scientifique.*

INAUGURATION OF THE NEW COLLEGE OF PHYSICAL SCIENCE AT NEWCASTLE.

The new College of Physical Science at Newcastle-upon-Tyne was inaugurated on Wednesday, October 24th. The college has every prospect of great success. The funds are ample; there are already a considerable number of students, and the appointments of the professors have given the greatest satisfaction. They are Professor Herschel, B.A., Professor Aldis, M.A., Professor Page, LL.D., and Professor Marreco, M.A. In addition to the chairs occupied by these learned gentlemen, it is proposed to establish a chair of history and political economy. The chair was occupied by Sir William Armstrong.

The Dean of DURHAM said the occasion on which they met was one both of satisfaction and hope to Newcastle and the neighbourhood. It was a matter of satisfaction that in little more than six months after a scheme for a college of scientific teaching, with a special view to the wants of the north of England, was proposed, they had been enabled to begin an effective course of instruction; and it was a further gratification that their plan had been understood and responded to by those for whom it was designed, so that they were not in the rather awkward position which had sometimes been the lot of similar institutions at their commencement, of having professors but no pupils. He would endeavour to place before them that day something of an estimate of the place which physical science ought to hold in a good education for the upper and middle classes, particularly in a part of England whose wants were somewhat peculiar. If he wanted to define a good education, he should say that it consisted in two things,—first, in drawing out and disciplining the powers of the mind so as to make it do our bidding in our coming life, and at the same time in imparting along with this power a considerable amount of valuable information. Now, on the first of these points—the discipline of the mind—a great deal might be said for the study of language. Language rightly used was a kind of mental logic; it trained the young mind unconsciously in accuracy of thought and in power of expression, and as we got older its higher studies introduced us to those great works of the Greeks and Romans which, for beauty both of thought and words, had never been equalled. The greatest English minds, and the best character of English thought, had been formed since the Reformation by two things, the Bible and the study of the classics; and those who believed that this character, and all the history which has been its result, had been inferior to none in Europe, would never be disposed to give up the great works of the old world as one most powerful instrument of education. At the same time, he could not deny that these studies had been, and still were, carried on in an absurdly exclusive fashion. The fact was that in all our schools, public or other, we needed far more division of work, or what our neighbours in France and Germany call a "bifurcation" in this matter. We may give our boys pretty much the same general education up to thirteen or fourteen, but then let them "bifurcate"—some keep to their languages, and others go off to a school of natural science, according as the boys' strong propensity or the insight of an able master should direct. He should say, generally, that the advantage to the mind of an education in physical science was (1) that it trained us to habits of close observation, of inquiry, of induction, and of verification; (2) that in doing this it brought us into close contact with the actual facts of nature; (3) that it had a direct bearing on our business in life, to an extent which was hardly the case with any other study. The first advantage of the study was that it trained the mind of the student to those rules by which all great discoveries have been made; it made him insensibly familiar with the course of inquiry by which he might in very truth "interrogate nature," and it gave him a large knowledge of that immense world of material truth which nature could reveal. And in saying this, he had almost anticipated the second advantage which he attributed to this study, that, in a manner quite different from any other, it brought us into such direct contact with facts. Other sciences, mathematics for example, which were so essential, both as a basis for nearly all physical inquiry, and also as a means for proving and completing discoveries, are simply a source of argument and of deduction. The mathematician starts with a few obvious propositions, and the rest of his work consists in drawing deductions from these. This training was infinitely valuable; and it was especially valuable in physical science on this account—not merely because it so wonderfully strengthened the attention, and enabled men to carry in their heads long trains of argument and of calculation—but because it showed that physical science rests upon the highest laws of reasoning, and that we can only master it by vigorous and systematic training. But then, this training once gone through, the student of physical science must, as it were, grapple with nature itself, and very little he would ever know of it unless he could do its work for himself, with his own hands and with his own eyes. And this, by the testimony of all scientific men, it was important to impress upon the minds of students at the very outset. They would never know anything of chemistry unless they did good work in the laboratory. It was only by examining for themselves fossil after fossil that they could know anything of the structure of the earth. There was one other point, which perhaps he ought not to have reserved for the end. It was the practical value of these studies and their bearing on some of the most important professions in the country,—it was how far they would assist the student in "getting on." Now, he assured them he was far from undervaluing this very telling and eminently modern and permanently English view of the question. He was not sure that the eagerness for immediate results did not sometimes overshoot its mark; and he suspected that often the man who had spent two or three "unproductive" years in gaining a really profound acquaintance with his profession, whether as a lawyer, an engineer, or a clergyman, in the end turned out the more successful man. It was quite true that, in the North of England especially, the native energy and talent of our great miners and engineers, aided by unequalled natural advantages, had placed them almost at the head of the enterprise of the world; but they were too sagacious not to be aware that in days of keen struggle, they could not hold their own unless they could enlist the most tried and educated workmen on their side. They were too well aware that in many branches of labour, of everything especially which had to do with art—of the composition of colours, for instance—they were surpassed by foreigners already, and he would add, to take a more limited though still a just view of the question, they, whose children were about to embark on those great professions, knew that their best chance, and far their noblest course, would be by attaining a thorough scientific mastery of the work they would have to do in life. They had heard what his notions of a good education were, and that they were far from being limited to the teaching of physical science. He hoped that literature would soon take its place in their classes, and there was nothing which would more rejoice him than to see the early foundation of a Professorship of English History and of Political Economy.

A luncheon was afterwards served in the Central Exchange News Room, to which a large number of ladies and gentlemen sat down. When the usual loyal toasts had been drunk,—

Earl Grey proposed "Success to the Newcastle College of Physical Science." His lordship remarked that the College was intended to give sound instruction in the principles of physical science to young men who for the most part would in future life take an active part in the various industrial enterprises for which the district was distinguished, and who would be the main assistance in carrying on the mining operations, shipbuilding yards, engineering, chemical and other great works which were in operation in the town and neighbourhood. It was therefore highly desirable to give them such sound instruction in the principles of physical science as would enable them so to join science with practice as to afford them a far better chance than they ever possessed before of making advances in the industrial pursuits of the district. They knew what great improvements had been effected in the various departments of industry which distinguished this neighbourhood, in the past thirty or forty years, and it was reasonable to hope that when there were employed a much greater number of persons who not only knew from practice and from experience how they ought to be carried on, but who were also instructed in the principles of science upon which all improvements proceeded, the career of improvement would proceed with accelerated speed. The College was intended to increase the knowledge of the most effective mode of applying the powers of nature, and was calculated directly to improve the condition of every man in the country; because they must consider how, by the beneficial action of commerce, improvement in any one branch of industry contributed to the advantage of all. No doubt when great discoveries and inventions were made, those whose enterprise and skill and knowledge had achieved the improvements obtained the first and largest reward; but it was impossible in the nature of things that the reward which they derived from their exertion should not extend to the community by whom they were surrounded. It was the world at large which benefited by the improvement in physical science, and it was the advancement of physical science that the College was calculated to promote. But though that was a tempting field for discussion, it was far too extensive for him to enter upon at that time, and he could only say that while the College was most deserving of their support upon the grounds which he had stated, the toast of success to it was most fittingly coupled with the health of Sir William Armstrong. The name of Sir William had a European, or rather a world-wide celebrity for the success with which he had applied physical science to useful productions,—not only in regard to those fearful instruments of destruction with which his name was so closely associated, but what was, he felt, of far more importance, to a variety of machinery and contrivances of the utmost value for supplying the wants of mankind. The example and success of Sir William Armstrong were the strongest encouragement that could be given to the youth who would attend the College which had now been founded.

The toast was drunk with great enthusiasm and with all the customary honours.

The Chairman, in responding, said he felt great difficulty in reconciling the prominence of his position at that table with the absence of prominence in the services which he had rendered to the institution which had that day been inaugurated. He was but one of a large committee which had devoted its labours to the promotion of the undertaking, and whatever thanks were due in respect of those labours were due to the committee jointly, and not to himself individually. He, therefore, in the name of his colleagues, thanked them for the good wishes which had been manifested towards the institution which had been the object of their care. He trusted that the example which had been shown in Newcastle in regard to the establishment of that college would be rapidly followed in all other important towns in the country; for he was satisfied that it was only by scattering local colleges over the whole land that they could hope to effect that widespread diffusion of scientific knowledge which was so essential to the advancement of the nation in a moral as well as an intellectual point of view. That object would not be effected by great national scientific colleges; but only by bringing scientific instruction to the doors of the people. They must enable them to have it at home, and not allow them to be any longer deterred from seeking it by the great expense and inconvenience of travelling to distant places. It was surprising how little had yet been done in the way of spreading scientific knowledge among the people of this country. It was very different on the Continent; and had scientific instruction not been confined, as it had been, to a few persons, we should have had a vastly greater amount of practical and beneficial results arising from the application of science than we had actually experienced. The value of scientific education was held in far higher estimation on the Continent than in England. Its value had been fully recognized by all those nations who were our rivals in industry, and it was clear that the greater diffusion of scientific knowledge among those nations had been the principal cause of the more rapid progress which had been observable in their industries than in our own. We were far more ahead of our rivals twenty years ago than we are at the present day, and unless we awakened to the necessity of improving our condition by the promulgation of science, we might expect to be rapidly overtaken. Our rivals are already close upon our heels—closer than was generally admitted in this country, and it ill-behoved us to slumber in fancied security. He hoped, then, that the college which had just been inaugurated might tend to avert that danger, not only by its direct local effect, but by leading to the establishment of several similar institutions in other parts of the country.

THE RELATION OF MINERAL OILS TO FIRE.

The following letter by Professor Atttfield has recently appeared in the *Times*, and the subject it refers to is one deserving the special consideration of chemists throughout the country:—

"The awful conflagration at Chicago was started by a boy in a cowshed. He took with him a mineral oil lamp, which the cow kicked over. Accepting this statement of the origin of the fire as true—and the frequency with which fires are kindled, afloat and ashore, by the new mineral oils is unquestionable,—what conclusions should be drawn and what lessons learnt? Nay, to ask a more practical question, how does the public stand respecting knowledge and ignorance on the subject of fires? That some substances are combustible and others incombustible, that some combustibles burn more readily than others, and that any combustible material catches fire sooner under certain conditions than it does under others, are facts well and widely known and insensibly acted on by us in the management of households, warehouses and such structures. We rightly allow only metal and air to be in immediate contact with our domestic fires and flames, we take more care of gas and spirits than we do of candles and coals, and we know that curtains hanging from a pole are far more easily fired than curtains folded and stored. To wilful or thoughtless neglect of one or more of these points is most generally to be traced the cause of a fire; but not always. A person may have occasion to handle a material of whose relation to fire he is ignorant; or, knowing that the thing handled is combustible, a man may be ignorant of its relation to other combustibles. This latter is the present position of the public, abroad as well as at home, respecting those mineral oils which during late years have been so largely used for illuminating purposes, and which now and again cause fires of lesser or greater magnitude. The degree of inflammability of colza and the other old vegetable oils is fairly well known. They cannot easily be fired, except on a wick, and even then a flame must be applied carefully and for some little time. On the other hand, everybody who uses them knows that common spirits and naphtha catch fire in a moment; these, therefore, are handled, stored and employed with adequate precautions. But the mineral oils, though much nearer to spirits than to the old oils in their degree of inflammability, are treated by the public as though belonging to the latter class. The mistake could not well have been avoided; for these mineral liquids are more closely allied to oil than to any other class of fluids, they are used in the place of oil, and hence have come to be sold by oilmen and purchased by consumers under the name of oil. Doubtless the public will in time learn that in relation to fire these substances are of a spirituous rather than an oily nature. We may then expect that fires started by mineral oils will result from carelessness or wilfulness, and not from ignorance. Meanwhile Parliament, the Press, men of science, and oil traders must do their best to contribute to the removal of this ignorance. Parliament has already done something, and promises to do more. It is now in Great Britain illegal to sell the more inflammable kinds of mineral oil, properly termed petroleum spirit and paraffin spirit, unless every vessel is labelled as follows:—'Great care must be taken in bringing any light near to the contents of this vessel, as they give off an inflammable vapour at a temperature of less than 100 degrees of Fahrenheit's thermometer.' But petroleum oil, as at present sold in England, gives off inflammable vapour at temperatures very slightly above that just stated. Paraffin oil is less inflammable than petroleum oil, but both take fire with the utmost readiness compared with olive, sperm, colza, and the other vegetable oils. I would implore petroleum merchants and oil dealers generally to endeavour to import and supply petroleum oil which shall be less instead of more inflammable than paraffin oil. From my own experiments and experience I venture to assert that this could be done without injury to the illuminating power of petroleum, and, if effected gradually, without the slightest risk of the British paraffin oil driving the American petroleum oil out of the market; indeed, I am of opinion that public confidence in petroleum would be so much increased that a still larger trade than ever would be carried on in that important article. The Government has undertaken to amend the Petroleum Act next year, more particularly as to the way in which the inflammability of the vapour of the mineral oil is to be ascertained. Perhaps the cause of public safety from fire would be usefully served by the insertion of a clause rendering obligatory the employment of a caution-label on all vessels containing any kind of mineral oil, the label of the present Act serving as now for petroleum spirit and paraffin spirit, and one drawn in simpler and less alarming terms for petroleum oil and paraffin oil.

"From the whole matter the public must conclude that its present position respecting the relation of mineral oils to fire is one of ignorance, and therefore of danger. The sooner this ignorance is dispelled by enactments of the Legislature, full discussion in the Press, and the occurrence of fires, which, let us hope, will never again approach the fearful nature of that in Chicago, the sooner shall we arrive at a time when fires kindled by mineral oils will not be more frequent than those started by other combustible substances. That they are more frequent I think no disinterested person will venture to deny."

The Pharmaceutical Journal.

SATURDAY, OCTOBER 28, 1871.

Communications for this Journal, and books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

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POISON LABELS.

So much has been said of the notice taken of the poison question by the general press, that it seems desirable to place before the readers of this Journal any comments that may from time to time appear in the London or provincial newspapers. Through the courtesy of a correspondent we are enabled to reproduce, from the *Carlisle Express and Examiner*, the following editorial article upon the case of poisoning reported at page 355. The article is evidently written in a spirit of fairness that we should be glad to see more generally manifested by those who discuss the difficult subject of accidental poisoning.

"The facts brought out at the inquest held in Carlisle on Tuesday last, upon the body of a child that had been poisoned by an overdose of syrup of poppies, possess an importance beyond the case which was immediately under consideration. That the child died from the effects of the poisonous drug was placed beyond question, and the medical man mentioned another instance which had come under notice recently, in which a child that was troublesome at nights had received his quietus in the shape of some narcotic of a similar kind. Mr. Parker, the druggist, stated that it was not a medicine that he recommended, and he denied having given any directions or advice at all in supplying the bottle last week; but it was certainly far from satisfactory for the jury to hear an experienced apothecary saying that a teaspoonful could be administered with safety, and a medical man of extensive practice asserting that such a dose was fatal to a child so young, and backing up that view by authorities of the highest standing. Such a collision shows clearly the wisdom of the Legislature in requiring that such preparations should all be labelled "Poison," so that those who use them may at least have something to remind them that death lurks in these 'drowsy syrups.' There are good grounds for believing that they are most extensively used among women who wish to save themselves the trouble of nursing; therefore, it is all the more important that the provisions of the Legislature should be carried into effect. The directions of the 'Sale of Poisons Act' (1868) are clear and emphatic. It is enacted, under a penalty, that 'it shall be unlawful to sell any poisons, either by wholesale or by retail, unless the box, bottle, vessel, wrapper, or cover in which such poison is contained be distinctly labelled with the name of the article and the word 'Poison,' and with the name and address of the seller of the poison.' Opium, and all preparations of opium or of poppies, are specifically mentioned in the schedule of the Act, and this inquest—which affords a good example of the value of those coroner's inquiries which some people would abolish—will, we trust, have the effect of reminding dealers in poisonous drugs of their duties and responsibilities."

This case is interesting, from the fact that it illustrates one of the difficulties involved in the application of the Pharmacy Act of 1868, viz. the question how far the use of the poison label should be carried as one of the precautionary regulations for preventing accidental poisoning.*

It has been maintained by many that the use of the poison label for paregoric and such medicines would be an absurdity; and we thoroughly agree with this opinion as regards very many of the circumstances under which paregoric is used. The same view might, perhaps, be taken in regard to syrup of poppies, were it not for the fact that this syrup and other mild narcotics "are most extensively used among women who wish to save themselves the trouble of nursing." Bearing this in mind, it does not seem an unreasonable opinion that "such preparations should all be labelled 'poison,' so as to remind those who use them that death lurks in these 'drowsy syrups;'" nor, apart from the misuse of these narcotics, can it be deemed a strained interpretation of the Act to include under its provisions for the use of the poison label a preparation that is capable of proving fatal to those for whom it is chiefly used.

We cannot, therefore, complain that our contemporary, referring to the "clear and emphatic" directions of the Act, expresses a hope that this case will have the effect of reminding dealers in poisonous drugs of their duties and responsibilities; but it must not be supposed that we also admit Mr. PARKER to be censurable in this case; for though the CORONER distinctly put forward the opinion that the Act rendered obligatory the use of the poison label for syrup of poppies, it must be remembered that the contrary opinion is held as decidedly by very respectable authorities. They would argue that in this case the poison label would not have prevented the death of the child, either because such a wide use of this label as to comprise syrup of poppies, paregoric, etc., would make that precautionary regulation ineffective by reason of its being so familiar as to be little heeded, or because of the bad habits, ignorance, etc., of the people using such preparations, or because of idiosyncrasy. There is, no doubt, some ground for each and all of these reasons being urged against the wider use of the poison label; but we believe that whatever cogency those reasons may have in this respect, they would be still more effective in support of the view that the sense of individual responsibility in a properly qualified pharmacist, no less than regard to self-interest, would afford the public security against the danger of poisoning by accident or misuse, far more effectually than the prescription of regulations which, in spite of the effort to make them specific and precise, are nevertheless open to diverse interpretation.

* Just as we are going to press we have received the report of another case of poisoning by syrup of poppies, which will be found printed at p. 356.

While speaking of this subject we cannot refrain from again mentioning the very frequent misunderstanding of the provisions of the Pharmacy Act in regard to the sale of poisons that is evident in the remarks of magistrates and coroners. Within the past month we have had to record no less than four occasions* upon which a censure has been passed, in terms more or less inappropriate, upon persons who have complied with all the requirements of the law.

It seems to be a matter worthy of the consideration either of the Privy Council or of the Council of the Pharmaceutical Society whether it would not be advisable to furnish all coroners and magistrates throughout the kingdom with information as to the present state of the law relating to the sale of poisons.

THE RELATION OF MINERAL OILS TO FIRE.

On another page we reprint a letter to the *Times*, in which the writer, Professor Attfield, refers the many conflagrations resulting from the incautious use of the different varieties of mineral oil to ignorance on the part of the public respecting the relation of these liquids to fire. The point of the communication is that paraffin oil and petroleum, being sold and used under the name of lamp oil, most consumers naturally treat them with neither more nor less care than would be observed with colza, sperm, and the old vegetable oils; whereas in the readiness with which they catch fire, and the facility with which they assume the vaporous condition, they more closely resemble spirit of wine or turpentine, and should be stored, carried and handled with all the precautions commonly adopted in manipulating these inflammable liquids. In such a serious matter it is, no doubt, desirable to endeavour to enlighten the public by all possible means, and pharmacists, who are rightly supposed to possess chemical knowledge on general as well as pharmaceutical subjects, may frequently have opportunities of contributing to so desirable an end. The existing and prospective legislation on this matter in Great Britain and America can only be excused on the plea that it is provoked by, and intended to counteract, the ignorance of the majority of consumers of mineral oil. Such notices by the newspapers as that to which we now allude also help in displacing this ignorance by knowledge. But we fear the object will not be fully accomplished until many more of these fires have occurred; for no facts are burnt so indelibly into the brains of John Bull and Brother Jonathan as those which cost them dearly. When science comes to be taught in schools, familiarity with the simplest first principles will go far to enable us to avoid catastrophes which arise from our ignorance respecting common things.

* See *ante*, pp. 257, 276, 298, 317.

On Wednesday next, November 1, the Evening Meeting of the Pharmaceutical Society will be held. On that occasion Mr. J. B. Barnes will bring under the notice of the meeting a new excipient for pills; Mr. J. E. Howard will make a statement concerning the examination of some cinchona-trees grown in India; Mr. T. Greenish will give some particulars as to pharmacy in North Germany, the result of inquiries made during a recent visit; and Professor Redwood will bring forward the subject of the substitution of proportional numbers for specified weights and measures in the description of processes in the Pharmacopœia. It is hoped that the audience will be a numerous one, and that many members who have not hitherto attended these meetings will endeavour to be present. The chair will be taken at 8.30.

Although it does not lie within the ordinary province of this Journal to call attention to errors into which, in common with their English brethren, Transatlantic editors sometimes fall, one paragraph has been going the round of the American newspapers that it is a great pleasure to be able to contradict. It seems to have been telegraphed to St. Louis during the meeting of the American Pharmaceutical Association; and the following, taken from the *American Journal of Pharmacy*, will serve as an illustration of the unlooked-for and unwelcome services sometimes rendered by the cable telegraph:—

"Obituary.

"Professor Robert Bentley.—During the late meeting of the American Pharmaceutical Association in St. Louis, a cable dispatch announced the death of this zealous labourer in the cause of science. The intelligence cast a gloom over the members who knew him by reputation or personally, and the sad event was feelingly alluded to by Mr. Henry B. Brady, a personal friend of the deceased. In the next number we shall lay before the readers a biographical sketch of the deceased."

We believe the error arose in the announcement of the death of Mr. R. Bentley, the publisher.

It is worthy of observation that the deficiency of sound education, so frequently apparent in the candidates for the Pharmaceutical Society's examinations, and which has for a long time and in various ways been under consideration, is not confined to Pharmaceutical students. The same lack has been met with in the Preliminary Examinations of the Royal College of Surgeons. With a view of bringing the subject prominently forward, Mr. Gay, at the meeting of its Council, on the 19th inst. gave the following notice of motion:—

"That the proportionately large number of rejections at the Preliminary Examination for the diploma of the College is a fact which demands the serious consideration of the Council; and that a Committee be appointed to consider the subject, and to report to the Council thereon."

At the London Institution the first Evening Lecture for the session 1871–72 will be delivered on Thursday, November 2nd, by Dr. J. H. Gladstone, the subject being, "Michael Faraday: the Story of his Life."

At the meeting of the Chemical Society, on Thursday, November 2nd, Mr. W. H. Perkins will read a paper on "Anthroflavic Acid."

Provincial Transactions.

GLASGOW CHEMISTS AND DRUGGISTS' ASSOCIATION.

The opening Meeting of the session was held in Anderson's University on Wednesday evening, 18th inst., Mr. THOMAS DAVISON, President, in the chair. There was a good attendance of members. Mr. H. C. Baildon, President, and Mr. John Mackay, Hon. Secretary of the North British Branch of the Pharmaceutical Society, were also present, from Edinburgh.

The CHAIRMAN briefly introduced EDWARD C. C. STANFORD, Esq., Ph.C., F.C.S. (British Sea-Weed Company), who delivered the inaugural address as follows:—

Gentlemen,—As this is not the first time that I have been requested by your committee to open your session, I feel that, however inadequately and imperfectly I may perform the pleasing duty they have imposed upon me, I must, nevertheless, now look upon it as a duty, and one that can be no longer postponed.

I would have much preferred that some one of you should have occupied this position on the present occasion; one more conversant than myself with the numerous details of your most detailed of all professions; one who could have spoken with authority on those numerous vexed questions which are now becoming so interesting to all of you. You will not, however, expect me to enlarge upon these; I could add nothing to your information on such topics; and, moreover, I would select higher ground for our occupation this evening. It is always a relief to turn from those petty annoyances, which are inseparable from every man's daily life, to a larger field, where there is light and recreation. We are all allowed to soar aloft into the calm serenity of philosophic truth, where the little vapours of human disputes never rise and cannot penetrate. It is interesting even to observe from these thoughtful eminences the money-grubbers of the earth, and note their infinitesimal size and true value. Without, however, touching on vexed questions, I feel bound to say a few words about the Pharmaceutical Society. I have had unusual opportunities of intimately knowing for years the men whose names are only now becoming familiar to most of you. Through good repute and evil repute, mostly the latter, they have fought an uphill fight for many years against the ignorance and prejudice of this country. You cannot be sufficiently grateful to these disinterested men that they have at last won the position; nor can you ever sufficiently revere the memory of their intrepid leader who fell nobly fighting for the good cause. I say disinterested, because few of the founders of the Pharmaceutical Society could ever expect to reap the benefit of their labours in their own lifetime; they worked for the public good, and they worked for posterity. And let us not forget that the ignorance they fought against was largely developed in their own ranks. If you compare the state of British pharmacy when the Society was first founded with that of Continental pharmacy, and the status of the British pharmaceutist with that of the French pharmacien, you will see how much we had to be ashamed of and how much we had to learn. The pharmacien, a man of university education and of high scientific attainments; the pharmaceutist, a poor apprentice, who studied the "rudiments of chemistry" in the shape of pounding various drugs, and never cared to know from whence they were derived. The emblem of the one, the microscope and the balance; the emblem of the other, the pestle and mortar. The founders of this Society saw that it was no use to clamour for an equal position for their brethren until they were educated for that position. To have suddenly converted the status of the chemists and druggists of Great Britain to that of high-class pharmaceutists without education, would have been quite as sensible as to have made them all post-captains, and sent them to sea without teaching them navigation; though the former mistake might have been better for the British navy.

The Council acted wisely, therefore, in at once setting to work as an educational body. They established a school of pharmacy, chemistry, botany and materia medica. Fownes and Pereira, the most eminent men of the time, were the first lecturers, and their successors have fully maintained their reputation. There is no school in London where the teaching of these special sciences is so sound and so good. No greater proof of its success can be desired than the comparatively large number of young men who have passed the curriculum, whose names are already well known in pharmacy. So far from being the last in the race, there is every probability that the present race of pharmaceutists will not be excelled, and may even be unequalled in any other nation. Now, however, that the Pharmaceutical Society is an examining body, and the only one under Government by which all future pharmaceutists will have to be examined, their position has certainly become anomalous, and they must sooner or later sever this connection. They will have to renounce the right of educating and then examining; the examination must be restricted to their rules, but the education must be open and free. London, as the great heart of the United Kingdom, will always be the centre; and the eminent professors who have made the reputation of Bloomsbury Square will, I trust, long guide the helm of pharmaceutic education. But every large city must become another centre for the education of its own district. You are particularly well situated here, as almost any kind of scientific education can be cheaply obtained in this city. It is time to be up and stirring. I cannot congratulate you very heartily on your remarkable progress in pharmaceutic elevation so far; but you are earnest men; and if *festina lente* is your motto, it is a good one, if you do not allow the second word too much to disqualify the first. There is no doubt your action has been a good deal paralysed by the very large number of surgeons who keep open shops here; in fact, I never saw any city so peculiarly situated in this respect. The public have a right to expect that all assistants in these shops should pass the examinations of the Pharmaceutical Society. The evil will not, in my opinion, be a lasting one, for I am convinced the public welfare demands a rigid separation of medicine, surgery and pharmacy, as in France, and to that it will come sooner or later.

Any man who wishes to become eminent in either of these branches of science (and all students ought to endeavour to be so) will find that he has the work of a long lifetime before him; and to suppose that pharmacy can be learnt, in its true sense, in the short course presented to medical students is perfectly absurd. The fact really is, that pharmacy, materia medica, and chemistry and botany in their relations to it, were almost unstudied sciences in this country, and there were no examinations, worthy the name in either before those of the Pharmaceutical Society were established.

Another effect of stringent examination will be to considerably decrease the number, and largely increase the intelligence of those entering the profession. Both these effects are improvements; but the latter involves another difficulty. Where are the masters who can teach the apprentice of the present day the theory of his profession? Not until the old school has passed away can we expect to find masters generally sufficiently qualified to teach the apprentice all he requires to know to enable him to pass the examinations of the Society.

I am very glad to see, from the last report of your committee, that they are already up and doing; that they know the wants of their brethren, and are determined to supply them, wisely and well. It must also be a satisfaction to all, that one of your oldest members should now represent you at head-quarters. The London Council is much the better for the shrewd common sense so characteristic of its Scotch members.

Perhaps even some of my present audience would not care to pass a stringent examination in thermal equivalents or the primordial utricle. Nor can we expect the masters, who really are well posted up, to devote so much of their time as would be necessary to thoroughly teach such things.

It, therefore, will always be necessary that the apprentice of the future should have access to local schools, and that a certain portion of his time shall be devoted exclusively to the study of the science of his profession. This will, of course, demand some concession on the part of the masters in shortening the hours of labour; but as we get older we are beginning to find out that it is not necessarily those who work the longest that do the most work. We are beginning to measure a man's life not by its length, but by the work he has done. In all directions, in every trade, business and profession, there is a growing tendency to shorten the hours of labour. It is a movement with which I heartily sympathize; because I believe it increases the health, and therefore increases the available work of our race. It is astonishing to me that men who feed and rest their horses when they want to get work out of them, and where they only want muscle and strength, will allow, and even expect, their poor human drudges to wear out their minds and bodies in continual work. This is a digression, but I mention it here as a sign of the times, and one which will surely act to shorten even your hours of labour. Higher remuneration, shorter hours, and raised social position for you all, must be the result of the arduous labours of the founders of the Pharmaceutical Society. I cannot leave this subject without congratulating you on the wonderful success of the Pharmaceutical Conference. With the Edinburgh Meeting fresh in your recollection, I need scarcely remind you of the value of its meetings, nor of the extremely social and real science to be found among its members. The few who met the first year at Newcastle could scarcely have expected that by this time we should number nearly 2000 members, and publish a most valuable year-book.

Let us now take a rapid glance at some of the extraordinary advances that the last few years have seen in pharmacy. It is impossible to predict what may be the results of a more extended knowledge of chemistry in its application to medicine. But we may confidently anticipate that remedies will be found to alleviate all human suffering; and that all sickness may become curable but that of old age, for, unlike the ancient alchemists, we except this ailment as beyond human power. What does not mankind owe to the discoverer of chloroform? Reckon up the sum total of lives saved and suffering alleviated, and tell me, if you can, the value of that discovery. Again, following the germ-theory of disease, how enormously has the external use of carbolic acid as a germ destructive increased the surgeon's power to save the limbs and the lives of his poor patients. What would medicine do now without morphia, quinine, strychnine and the other alkaloids, the extraction of every one of which, from their natural sources, has been an elaborate chemical study and a triumph in itself? Who can define the limits of such inquiries? We have every reason to expect that some, perhaps all of these complex bodies will some day be produced artificially in the laboratory. The masterly researches of Dr. Wright, on the substitution products of morphia and codeia, certainly point in this direction; while the preparation of artificial quinine has been as long looked forward to as was the "elixir of life" and the "philosopher's stone" in former times. It is remarkable that researches of this nature, if unsuccessful in attaining the object in view, are invariably fruitful in other discoveries. It was, I believe, in researches to test the possibility of making artificial quinine, that Mr. Perkin made his wonderful discovery of mauve,—a discovery which has laid the foundations of a gigantic industry of such rapid growth that it has revolutionized in a few years the colours of the world. So the late Dr. Matthiessen, in his research on morphia, obtained apomorphia, another base differing from the former only by an atom of water, and yet having such totally opposite properties that it is the most rapid emetic known.

Recently, another substance of vegetable origin, alizarine, has yielded to the persevering attacks of chemists, and is now manufactured largely, and in many instances it supersedes, and in some respects is finer than, the natural colour. It is worthy of remark that this new colour, like those from aniline, is a product of coal-tar, being derived from anthracene, one of its constituents, discovered by Dr. Anderson. It is a remarkable fact, and worth reflecting on, that as we extract our light and heat from coal, the buried light and heat of the sun collected ages ago, so we are now enabled even to split up the buried rays into all their component colours and print them indelibly on our fabrics. This is not a figure of speech, but an actual fact.

There is little doubt that indigo, another vegetable colour, will not long hold out against the determined synthesists, who will ere long succeed in piecing it together; indeed, the discovery is already announced. Think, also, of the numerous odours and flavours chemistry has given us,—the subtle ethers, which render the flavours of our choicest fruits even more perfectly than they could be obtained from the fruits themselves. As one example only of an odour, take nitro-benzol, now so enormously used to give an almond flavour to a scented soap, at a cost within the reach of the poorest of our population.

The increasing use of bromide of potassium, another of chemistry's contributions, would have been impossible, were it not for the extraordinary discovery of an apparently evaporated sea-water bed in Germany. The amount of bromide consumed in medicine is now enormous, and most of it is derived from this source. The same mines have also completely changed our sources of potash; they produce far more than all the other sources of England and France put together, and have so reduced the price that carbonate of potash is now largely made in this country at a price which competes most favourably with American pearlash and will ultimately drive it out of the market. Bromide of potassium is an instance of a substance long used in medicine before its valuable properties were discovered.

One of the most remarkable chemical contributions to medicine is chloral hydrate; the rapid increase of the use of this substance is so extraordinary, that I know of one firm alone which disposes of 1000 lb. per week, and this is probably not half the consumption. It is certainly, after chloroform, the most curious selection from the laboratory of organic research, in its effects on the human system. I would venture to remark here that I hope Germany will not always supply the most of such preparations as this and the vegetable alkaloids. At present, no doubt, they have a large advantage over us in the manufacture of these substances where much spirit is required, from the extravagant price of duty-paid spirit here. Methylated spirit cannot always be used, and, moreover, it introduces impurities. It has always appeared to me that our Government should have gone further, and allowed the use of pure spirit duty free for manufacturing purposes; the use of such would have secured the admission to the works of excise officers, who could prevent any abuse of the privilege. It is admitted that methylated spirit can be made potable, and our local shebeens and police courts can testify to its value as an intoxicant. Indeed, if our whisky shops were restricted by law to the use of pure methylated spirit, we should cease to hear of the maddening effects produced in our streets by vile drinks of unknown composition. Pepsine and pancreatin deserve a passing notice,—these curious fermentive principles are now largely used to assist nature in the process of digestion. That these principles are identical with those secreted in the human interior, there is little doubt, but that they really have the large effect in the presence of the living stomach that is claimed for them, is, I submit, open to doubt.

Perhaps the most important of all technical chemistry is the utilization of waste materials; and, fortunately, it has been of late years greatly progressive. The history of large chemical works is generally that each accumulates enormous stocks of some waste material, which at last becomes such a nuisance that the owners are compelled to adopt some means of working it up. The process invented for the purpose of ridding ourselves of a nuisance often turns out a source of profit; such, for instance, are the utilization of soda-waste by Mond's process, and the recovery of manganese from waste still liquor by Weldon's process. Deacon's new process for the preparation of chlorine from hydrochloric acid by dissociation, bids fair, however, to supersede the use of manganese altogether. The manufacture of soap, too, is likely to undergo a considerable change if Professor Morfit's method of combining the alkali as carbonate direct with the fatty acid, and superheating to free the carbonic acid be generally adopted. The process is a very perfect one, and the soap can be made and finished in a few hours.

I wonder what Sir Humphry Davy would have said to any one who talked about stellar chemistry. That great man, in ridiculing the idea of lighting London with gas, triumphantly asked the fanatics who proposed such a wild scheme, whether the dome of St. Paul's was to be the gasometer? Yet we cannot imagine Regent Street illuminated, or rather darkened, with dips again, and to us stellar chemistry has a real meaning. Who will venture to bound a science which reaches far away through space, and with unerring accuracy tells us the composition of distant worlds and distant suns? What can be more humiliating to our small intelligences than the reflection that a distant star will photograph its spectrum on a sensitive surface with the ray of light that left it when the oldest man in this room was a boy? What would the great father of British chemistry have said had he stood in the lecture-room of the Royal Institution, where his great discoveries were made, and seen the burning hydrogen extracted by your great countryman Graham, from a meteorite, the heat and light of another world? or could he look with Lockyer on the burning flames of hydrogen, which dart up from the sun a height of 50,000 miles; or could he read the flashing telegrams which run so rapidly round our world, that all our notions of time are completely upset, and we actually receive intelligence to-day which was sent to-morrow? Excuse the apparent absurdity, it only shows how powerless language is to keep up with human progress. Could he have lived with us and seen a large city dependent entirely for its communication with the outer world by a marvellous kind of photography, so minute that it enabled a pigeon to carry a proof-sheet of the *Times* under its wing.

Could Sir Humphry Davy now stand in our favoured position and see all these advances, he might, indeed, admit with Newton that he had simply played as a child on the seashore, while the great ocean of truth lay unexplored before him.

In technical pharmacy, what advantages are now given by the use of steam and gas! Steam, gas and water enable us now to carry out preparing processes which were impossible before their introduction.

Coffey's curious application of high temperatures in stoneware by convection or circulation of highly heated paraffin oil well deserves attention; it may be found specially useful in evaporating some of those corrosive liquids which can only be heated in stoneware vessels, the heating of which is always difficult.

I am glad to notice some recent improvements in tincture presses,—no apparatus is more susceptible of improvement; there is great need of a small economical hand-press, which would combine the strength of the hydraulic press with the sustaining power of the screw, and need little attention. Two presses lately described in the PHARMACEUTICAL JOURNAL appear to me important improvements.

Some improvement ought to be made in our measurement of doses; a drop, a teaspoonful, a wine-glass, are terms far too indefinite and various to be always employed in the administration of medicine, and we shall owe much to the inventor of a better system—a worse would be difficult to obtain.

No study can be more interesting than materia medica; to know the history of every substance that passes through the hands of the pharmaceutist adds an interest to his work, which must be felt to be understood. Every day, from all quarters of the globe, are new medicinal substances coming forward; perhaps we even too much neglect the valuable productions of our native soil.

Acclimatization of plants is being largely studied; several plants are on their trial in India and some of our other colonies. Of course, as in chemistry so in materia medica, the interest centres in quinine. A quinine famine is a thing we dare not think of, the idea is too horrible. The Indian Government cinchona plantations are flourishing, and we may expect them some day to be our chief sources of supply, if, meantime, the laboratory does not rise up in competition with them.

There is a large field open in this country to the patient student, in the effects of soil, culture and climate on medicinal plants. Any one in the country with command of a small garden, would be amply repaid by making this his study. There is a large range of most valuable medicinal plants, natives of our own country, which should all be made the subject of experiments.

The effects on the medicinal properties of various manures, of judicious leaf and root pruning where the fruit is required; of encouraging the foliage where the leaves are used,—these are important questions that have scarcely received any attention.

When we read of the enormous sums realized by madder crops, and even by the cultivation of beet in France, it seems that profit as well as knowledge might be the result of such inquiries.

Will no one tell us the cause of that enormous loss we annually sustain, this year worse than ever, by the ravages of the potato disease? No doubt it is a blight, but the existence of that blight shows that the plant is unhealthy, and points to the remedy of obtaining altogether new seed. I am satisfied from my own observation that over-manuring and local seed are strong predisposing causes to the disease. The subject has not been sufficiently studied; the problem is still open to some patient observer, and with its solution, the proud position of proclaiming to a grateful country the means of increasing its food supply.

The analysis of drugs and chemicals must always be an interesting study to the pharmaceutist, if only from the power it gives him of checking adulteration, and ensuring the purity of his materials.

And now a passing word on botany. I look on this science as an absolute necessity to every pharmaceutist; but it is such a delightful and such an easy study, and Providence has so strewn our paths with its beautiful illustrations, that no other inducement ought to be required to capture the inclination of all. No walk can be lonely where you meet so many well-known friends of the animal or vegetable kingdom. I do not wish to undervalue my fellow-men, but there is more pleasure and more instruction to me amongst the floral paths and woods and forests of the country, than in jostling through the crowded streets of a city. Man made the town and God made the country; there is no time for reflection in our busy workshops, and if "one touch of nature makes the whole world kin," seek it where it is to be found in the country.

The microscope is now within the reach of all, and it opens the gates of a new world; with its aid minute beauty and order may be seen in everything. Nothing teaches better the greatness of little things, and the harmony of nature. A speck of mould is a magnificent forest, a drop of water is a sea of life, a grain of dust is full of wonders. No student can read the researches of Deane and Brady without longing for a microscope.

At the risk of being considered tedious, I would in conclusion address a few words to the young men. It is for *you* that the Pharmaceutical Society has been established; *you* will reap the benefits of it. The founders have left *you* the legacy of a good name; they depend upon *you* to make it better; they expect *you* to raise the standard of excellence, of intelligence until the very name of pharmaceutical chemist shall be widely and generally known as synonymous with pharmaceutical perfection. It is a noble aim, and you have plenty to do to reach it. Let me give you a few hints. You will all some day pass your examinations. The first mistake you will make will be that of cramming up the necessary information, I will not oblige you by calling it knowledge; this is a rock that many split on; let me urge you to avoid it. If I were an examiner (which, thank Heaven, I am not), I would pluck without mercy a student who knew the whole Pharmacopœia, if he knew it only by rote; we do not want medical parrots. But if I examined a young patient student who knew a little, but knew it well, and who evinced a desire to learn for learning's sake, I would be very lenient with him. In making this selection, I should act in the interests of the Society, because the first man, like an ill-stuffed turkey, would disgorge his badly digested information immediately after the examination, and never digest any more; he worked for the purpose of passing, and that end being attained, he might as well order his funeral at once, and for any further use his knowledge would be to society at large, they might "see that the body was ready." Whereas the patient student would be a student all his life, and no man can be that, without acquiring knowledge always useful to his fellow-men.

The first mistake is too common, and I cannot too earnestly impress on you that examinations are merely intended as tests of knowledge. You ought to study, not for the examination, but for yourselves; knowledge is power, is money, is happiness, and in the highest of all senses, is everything. Better be plucked if the result be to get more knowledge, than to smuggle through an easy examination; and live and die—a blank.

Another mistake is to suppose that you have not the talent, that you cannot compete with others that have. Abolish the foolish notion; at the risk of being thought a dreadful sceptic, I state here at once that I do not believe in talent; but I *do* believe in industry; and if the two are placed in competition, the latter will always win.

Another mistake that you may fall into is, the idea that you have not opportunities; why, your daily life abounds in opportunities: not a drug you handle, not a poison you dispense but has its history. You ought to know it! Remember the philosopher is the observer of minute differences, he notices just those little things that are beneath the notice of other men, and it is upon these that he builds his theories. Many men saw the apple fall, but Newton alone observed it; and that petty observation has enabled his followers to weigh and measure the solar system. Kettles had been long in use before Watt's time, but in that master-mind a trivial circumstance led to the introduction of a mighty power that does most of the world's work in the present day. Mental blindness is the commonest characteristic of mankind; the habit of daily seeing and never observing the little things that make up our daily life must be shunned. At the risk of offending the Circumlocution Office, be always one of those disagreeable fellows "who wants to know, you know." Make nature tell you the reason why. You will find her wonderfully communicative; and you will find also that, unlike most communicative people, she has plenty of wisdom to impart.

A few words on the economy of time and the dignity of labour. Wellington, Nelson, and all our great men have been rigid economists of time; it is painful to reflect on the fearful waste of time which is so common amongst ordinary men. The older a sensible man grows the more he is compelled to reflect on the rapid advance of time, but it is often only when his powers begin to fail that he looks back on the days he has lost, never to be regained. Employ the fleeting hours, husband your time as you would a limited purse; whatever you do, do it with all your might, for if a thing is worth doing at all, it is always worth doing well; and this brings me to the dignity of labour. Whoever set about that common notion which couples labour with indignity was no friend to the human race. If there be any inheritance which is more than any other the birthright of every healthy man, it is the power of work. It is a proud legacy directly bequeathed to man by the Great Worker who built the universe. I cannot conceive a higher privilege or a greater pleasure than the capacity for doing work of a high order, and doing it well. An active mind in a healthy body is God's best gift. The dignity of labour is nature's nobility, she admits no idlers among her peers. Remember that the highest animals do the most work; and we as the highest have to keep up the labours and knowledge of 6000 years of human experience. Do not be afraid of work, do not be a human vegetable. Over-work may have killed a few, but idleness has dug the graves of millions. Besides the few are remembered for the work they have done, the millions have rolled away unheeded and forgotten. And remember, we are promised that for all labour there is a reward. It is difficult with some to appreciate this in all cases. One of you, for instance, may be called on, at considerable inconvenience to dispense a difficult prescription, perhaps late at night. The paltry couple of shillings you charge is a contemptuous remuneration to you for that labour, But could you see the effect of the potion your hand has mixed; could you stand by the bedside of the poor patient, some loved one of a family, and see the sorrowing relatives; could you note the light coming back to the eyes and the colour to the cheeks, and know that the crisis had passed, and you had been the means of snatching from the jaws of death another victim,—you would then realize the true value of your labour, a value inexpressible in words or money. So we all work, or ought to work, for the common good. "Work, therefore, while it is called to-day, for the night cometh when no man can work."

At the conclusion of the address, the CHAIRMAN proposed a cordial vote of thanks to Mr. Stanford, which was heartily responded to.

Mr. KINNINMONT then moved that a vote of thanks be awarded the Edinburgh representatives for their kindness in being present on the occasion, which was also agreed to,—Messrs. BAILDON and MACKAY briefly acknowledging the compliment.

It was then announced that arrangements had been completed with Dr. R. Carter Moffatt with regard to the special chemistry class, and that it would be commenced on Tuesday evening, November 7th. Fee to non-members of the Association one guinea, and to members 15*s.*, the Association undertaking to make up the balance. Text-book, Attfield's 'Chemistry.'

Mr. BLACK proposed a vote of thanks to Mr. Davison for presiding, which being cordially responded to, the proceedings terminated.

ABERDEEN SCHOOL OF PHARMACY.

The first of a course of lectures, by Dr. Beveridge, in connection with the Society of Chemists and Druggists, for those who have already some knowledge of the business, will be delivered on Monday, 6th of November, at 9.30 A.M., at the Hospital Court, 56, Gallowgate, and continued every Monday, Wednesday, and Saturday morning till 30th March, for the practical study of Materia Medica, with the Chemistry and Botany of the Pharmacopœia.

A summer course of lectures of a more elementary character will be given at the same hour and on the same days, commencing on Monday, 15th April, and terminating on Saturday, 13th July.

Fees for the winter session 25*s.*; fees for the summer session 15*s.*, payable during the first week to the officer, William Adam, at the school.

The employers, who are members of this Society, express an earnest hope that their Assistants and Apprentices will avail themselves of these lectures specially provided for them, and so qualify themselves for passing the necessary examinations of the Pharmaceutical Society.

The Library will be re-opened on Friday, 20th October, when books will be given out from 8 to 10 P.M., and every following Friday at the same hour.

Proceedings of Scientific Societies.

AMERICAN PHARMACEUTICAL ASSOCIATION.

At the opening Meeting of this Association on September 12th, a letter from Mr. W. W. Stoddart, late President of the British Pharmaceutical Conference, was read, introducing the President-Elect, Mr. H. B. Brady. The letter was warmly applauded, and after a few suitable words of introduction by the President,—

Mr. BRADY said: I did not expect, sir, to be called upon so early to express to you the feeling which I was charged to convey from the British Pharmaceutical Conference—the feeling of fraternal sympathy and of greeting to this large and important Association. We hold this Association as in some sort the exemplar which we have endeavoured to follow in establishing the Conference over which I have now, unworthily, the honour to preside. It was said that the organization which we had in London—the central organization in connection with pharmacy in England—was sufficient to provide for the wants of the British pharmaceutists in respect to intercommunication and the like; but it seemed to some of us, some eight or nine years ago, that you had in America an organization which would supplement in a very remarkable degree, if applied to England, the efforts of the Pharmaceutical Society of Great Britain towards the advancement of pharmacy and the amelioration of pharmacists. We followed, therefore, as nearly as we could, and with only such modification as the nature and condition of pharmacy in England, as compared with that in America, necessitated, and endeavoured to form an Association which should, as nearly as possible, resemble that which you have here. How far that Association has been successful may be gathered, not only from the increasing roll of members, but by the amount of, I think I can say without vanity, good work which has proceeded from the association of chemists throughout the country in England, as distinct from the Association in London. It was my happiness that the first meeting, the preliminary meeting of the British Pharmaceutical Conference, should be held in my native town; and from that moment to the present I have missed no step in its career. I do not propose at this moment, when time is so valuable to you at the opening meeting of your Convention, to enlarge either upon our present condition or our past history. I have merely expressed as much as I have to show to you how much I feel we are indebted to you, and with how much brotherly and fraternal sympathy I can meet you, and to thank you for the very hearty and very kind reception which I have met with, not only here in St. Louis, but ever since I landed on the American continent. I take the honour you have done to me this day, in making me one of your members, as a compliment rather to the British Pharmaceutical Conference than to myself; for, to a certain extent, I represent them officially. For them and on their behalf I thank you; for myself it becomes me with simple humility to say from the bottom of my heart, I feel that you have done me great honour.

On Wednesday, September 13th, the Committee appointed to consider the propriety of admitting the credentials of the delegate from the University of Michigan, presented a report recommending that the credentials should be returned.

The Treasurer's report was read, showing a balance on hand of $1209.39. The report was accepted, and referred to an auditing committee.

The committee on nominations presented the appointment of the following gentlemen as officers for the current year, who were duly elected by ballot:—*President:* Enno Sander, St. Louis, Mo. *1st Vice-President:* C. L. Diehl, Louisville, Ky. *2nd Vice-President:* Prof. G. F. H. Markoe, Boston, Mass. *3rd Vice-President:* Mr. F. Ash, Jackson, Mass. *Treasurer:* Chas. A. Tufts, Dover, N.H. *Perm. Secretary:* Prof. J. M. Maisch, Philadelphia, Penn.

A number of gentlemen representing the various sections of the country were appointed on the following committees:—Executive Committee; Committee on Progress of Pharmacy, Drug Markets, Adulterations, Queries, Business, Unofficial Formulæ.

An interesting report on the drug market was read by Mr. M'Kesson, of New York, chairman of the committee for the past year. In it he referred to the new tariff regulations under which many articles formerly paying duty are now admitted free; and traced the influence of the recent war between Germany and France on the drug trade; how speculation was rife, and prices continually fluctuating. Some interesting details were given in reference to the Smyrna opium trade, and the causes which led to the recent extensive alterations in prices, they having varied in New York from $3.75 to $8 or $9. The remarks on quinine showed that the importation of foreign quinine had greatly declined, in consequence of the market being better supplied by the manufacturers in the U.S., their increasing facilities for production having more than kept pace with the increasing demand. Mercury, oil of lemon, and other leading articles were also referred to, and their recent fluctuations in price commented on. The yield of cantharides in Europe was said to have fallen off very much of late, which, if continued, must result in America looking to other quarters for supplies. Last year twenty cases were imported from China, which, although differing in appearance from the European insect, had been found fully efficacious as a vesicating agent. Reference was made to the immense amount of adulteration still carried on, and the hope expressed that a remedy might soon be found for this evil.

Mr. Joseph H. Remmington, of Philadelphia, as chairman of the committee, presented the report on adulterations and sophistications. After some introductory remarks, he proceeded to say that of all substances powders are probably the most liable to adulteration; and that, principally, in consequence of the difficulty of detection. He had been informed of several wholesale drug houses where rooms are set apart for the purpose of mixing powders; and another case where there was a regularly organized adulterating department, with a foreman—of no doubt large experience—to superintend this special branch. All sorts of cheap substances are used in this department of industry, the object being to imitate as nearly as possible the colour and general appearance of the genuine article: flour, starch, terra alba, woody fibre, sawdust, musty ship crackers are all in demand for this purpose.

Spices, on account of their widely-extended use, are of all powders most largely adulterated, and some startling revelations might be made if a spice miller could be persuaded to disgorge his ill-gotten knowledge. The only safe way to get pure powdered drugs is to pay a good price, and buy from conscientious persons who are above suspicion.

Cochineal is adulterated with sulphate of barytes, a heavy white powder, which, when shaken with the insects, lodges in the wrinkles and crevices on the surface of the body. The weight is thus increased sometimes from 15 to 25 per cent.

Balsam of copaiba is often mixed, and sometimes found entirely fictitious, being composed of a mixture of castor oil, resin and oil of copaiba. Powdered ipecacuanha is sometimes so adulterated and weakened that tartar emetic is necessary to strengthen it. Oil of lemon has been met with, mixed with 30 per cent. of fixed oil.

Powdered opium is often mixed with powdered extract of liquorice. In fact, some dealers uniformly send to the grinders a certain proportion of liquorice with the opium, so that they might be ground together. Powdered rhubarb is frequently adulterated with curcuma. Sometimes senega root is mixed with cypripedium.

Castile soap frequently contains an undue proportion of water. It has been met with containing as much as 30 per cent. Acetic acid is also mixed with water, acidulated with dilute sulphuric acid.

Subnitrate of bismuth has been found mixed with phosphate of lime to the extent of 20 per cent., and citrate of iron and quinine adulterated with citrate of ammonia, and containing less quinine than called for, 10 or 15 per cent. instead of 25 per cent. Quinine itself is frequently met with mixed with cinchona, muriate of cinchona and salicine.

Santonine has been found adulterated with small particles of mica, and cream of tartar frequently mixed with tartar emetic. Cream of tartar is grossly adulterated; the terms strictly pure, pure No. 1 and No. 2, being used to indicate varying proportions of cream of tartar and terra alba, the latter material being largely imported from Europe for the express purpose of adulterating, the importations amounting to many tons annually.

Chloroform is sometimes diluted with alcohol, and iodide of potash in crystals mixed with bromide, and occasionally with bicarbonate of potash. Solid extracts are also much adulterated.

In the manufacture of syrup a considerable portion of the sugar is replaced by glucose, especially in making fruit syrups.

This report was warmly applauded, and gave rise to some discussions eliciting additional facts in reference to adulterations. Among others, Prof. Marcoe, of Boston, referred to white castile soap of handsome appearance which he had met with containing 20 per cent. of steatite, which could be detected by its insolubility; and W. Saunders, of London, Ont., to a quantity of oil of peppermint, which has been submitted to him for examination, containing 25 per cent. of castor oil. The presence of this latter, if suspected, may be readily determined by heating a small portion in a test-tube, when the volatile oil is driven off by the heat, the fixed oil remaining in the tube.

The afternoon of Wednesday was devoted to the examination of the magnificent collection of drugs, chemicals and pharmaceutical products brought together in the large upper half of the institute. Foremost among exhibitors of chemicals were Messrs. Powers and Weightman, the well-known manufacturing chemists of Philadelphia. At one corner of their table was an immense block of crystallized alum weighing 700 lb., showing throughout very beautiful and perfect crystals. A huge inverted glass globe contained $600 worth of sulphate of quinine. A second, of similar size, 153 ounces, $700 worth of sulphate of morphia, in blocks of interlaced crystals. An immense bottle of very pure-looking gallic acid; another of sulphate of cinchona, containing 151 oz. There were very fine samples of iodoform, iodide and bromide of potassium, and strychnia in crystals. Also elegant scale preparations, including citrate of iron and quinine, citrate of iron and strychnia, pyrophosphate of iron, soluble citrate of iron, and citrate of iron and manganese. Besides these, there were large bottles containing fine crystals of acetate of zinc, nitrate of ammonia, nitrate of silver and many other salts, which would occupy too much space to enumerate.*

The Association reassembled at 4 o'clock, when Professor PROCTER read the majority report of the Committee appointed to consider the feasibility of holding the International Congress in Philadelphia in 1876. The majority of the Committee report favourably, and urge the project of meeting here, but the minority thought it unwise. Discussion ensued, Messrs. Brady, Maisch, Procter, Parrish and Ebert participating, and on a division, the yeas and nays being called, the vote was largely in favour of the meeting being held in Philadelphia in 1876.

It was afterwards moved and adopted that, if the International Congress do not accept the invitation, a general invitation be extended to the pharmacists of all nations to meet this Association at its annual meeting to be held in Philadelphia in 1876, and that a committee of five be appointed a committee of arrangements, to report at a future (annual) meeting.

Mr. H. B. BRADY then read a paper by Mr. Daniel Hanbury, entitled, "Instructions to the Colony of Virginia of such things as are to be selected and exported to Great Britain." The paper was received with great enthusiasm, and a motion made and adopted that the thanks of the Association be returned to Mr. Hanbury for forwarding it.

The reading of answers to queries and volunteer papers was then commenced. The following are a few of the titles. We hope to be able to furnish some of the more important papers, or abstracts from them, on a future occasion.

The Preparations of Rennet and Pepsin, by Clemens Parrish; the Preparation of Camphor in Powder so that it will remain in that Condition, by Mr. Lowd, of Boston; Extracts of Meat, their Nutritive Value and their Comparison with each other, by Professor Ebert.

On Thursday papers were read on Cantharides, by Dr. E. R. Squibb; the Best Method of making Suppositories Extemporaneously, by Mr. R. B. Ferguson; Chloral, by Dr. Squibb; Adulteration of Olive Oil; Pharmaceutical Education, Citrate of Magnesia, by Professor Markoe and Mr. E. H. Sargent (two papers); the Substitution of Glycerine for Sugar in Fluid Extracts, by Mr. Gordon, etc.

It was decided that next year the Association should meet at Cleveland, Ohio, on the first Tuesday in September.

On Friday papers were read on Wild Cherry Bark, its Collection and the Preparation of the Cold Infusion, by Mr. J. L. Lemberger; the Root of *Pareira Brava*, by Dr. Squibb; Fluid Extract of Senega (two papers); the Preservation of Herbs, by Mr. J. Harrop.

Votes of thanks were passed to the Public School Board for the use of the place of meeting, to the local secretary, and to the "pharmaceutists, druggists and the citizens generally of St. Louis for their cordial and generous hospitality," and shortly afterwards the meeting was adjourned until 1872.

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* The only collection illustrative of British pharmacy was one forwarded by Messrs. Herring and Co., with an intimation that after the exhibition was closed it was to become the property of the St. Louis College of Pharmacy.

Parliamentary and Law Proceedings.

Cases of Poisoning by Syrup of Poppies.

An inquest was held on Tuesday afternoon, at the 'Golden Lion' Inn, St. Nicholas, Carlisle, before Mr. Carrick, coroner for East Cumberland, on the body of a child eighteen weeks old, the son of John Bell, pattern maker, of Grey Street, and Mary Bell, his wife. The first witness called was—

Mary Bell, mother of the deceased, who stated that the child had been ill from its birth. It had been troubled with wind. Dr. Carlyle had attended it at one time and it recovered. She got it vaccinated, and it became worse. Last Sunday, about six o'clock in the evening, she gave it a teaspoonful of syrup of poppies. The child continued to be restless, but she took it to bed about eleven o'clock, when it seemed to be sleeping as usual. About half-past two o'clock it began to be sick, and they sent for Dr. Carlyle, who came and saw the child, which lived till eight o'clock on Monday morning, when it died. She got the syrup of poppies (two-pennyworth) from Mr. Parker, druggist. It was not labelled poison. She had also given the child a teaspoonful of gin and water and the medicine which Dr. Carlyle had previously prescribed for it.

Dr. Carlyle said he attended the child about three months ago. It was a delicate child. On Monday morning he had been called in at four o'clock. He saw that it had had something, and he made inquiry, but was told it had got nothing but what he had ordered previously. The child was stupefied, and to all appearance comatose. They then told him that they had given it a teaspoonful of poppies at six on the previous evening. He told them the child was dying. Syrup of poppies is very uncertain in its effects. The regular dose for a child of twelve months is from ten to twelve drops. A teaspoon would hold about sixty drops. One teaspoonful would be likely to be a fatal dose for a child like that. Quite sufficient; half the quantity had been known to kill a child.

A Juror: But you don't know the properties? You say it varies.

Witness: It is an uncertain thing, and, therefore, not to be trifled with. Such a dose had been fatal in this case.

Mr. Edward Parker, druggist, said he remembered selling some syrup of poppies to a woman who brought the bottle now produced, on Friday or Saturday evening. (The bottle produced was an ordinary pint castor-oil bottle having affixed to it a blank label bearing Mr. Parker's name and address, and having written in ink on the blank space "Syrup of poppies.") The woman did not tell him for what purpose it was wanted. She did not say anything about it being for a child eighteen weeks old. She asked for two-pennyworth of syrup of poppies and made no remark whatever. He weighed out an ounce into the bottle. Very little had since been taken out of it—perhaps a teaspoonful. The label was already upon the bottle when it was brought to him, having apparently been used for the same purpose before. The writing upon the label was in his own handwriting. A teaspoonful is a dose, and would contain sixty drops.

The Coroner: Do you mean to say you would give a teaspoonful to a child eighteen weeks old?

Witness: I should scarcely give it a teaspoonful if it was eighteen weeks. I should not recommend more than half a teaspoonful for a child eighteen weeks old.

In selling medicines of this kind is it part of your duty to explain to the person buying it what is a proper dose?—Yes, I generally do.

Is it your duty?—Yes. Well, I am not sure it is our duty if we are not asked the question, but if we recommend an article it is our duty.

Assuming this woman came and said she wanted some syrup of poppies without telling you what it was for, is it your duty to explain to her the strength of it and the quantity that could be properly taken?—I can scarcely say that. As the label had been previously on, I should assume from that she was quite aware how to administer it. With regard to the strength of it, I have given a teaspoonful to one of my own children when only a month old, without any bad results, under a doctor's prescription.

Examination continued: It is made of one uniform strength. He made it himself. He did not think the strength varied. Generally a quantity of poppy heads were put together, so that the strength must be uniform.

Dr. Carlyle, on being referred to again, stated that he had the authority of Nelaton, Christison, Pereira and others for saying that for children from ten to twelve months the dose was from ten to twenty drops, and sometimes thirty drops; and they went up to half an ounce, which was four teaspoonfuls, for adults; but the whole of these authorities said it was a very uncertain preparation indeed.

Mr. Parker: Not if it is made according to the Pharmacopœia.

Dr. Carlyle: That depends whether the heads are ripe or not. Green heads contain more opium. The milky juice is extracted from the poppy heads when they are green and not when they are ripe.

The foreman of the jury said he thought it was desirable that the old woman who had gone for the medicine to Mr. Parker's should be called, as Mr. Parker and Dr. Carlyle differed as to the quantity to be given.

The Coroner: With all due deference to Mr. Parker, I think Dr. Carlyle gives and supports his statement with much more authority than Mr. Parker.

Mr. Parker said syrup of poppies was one of those things which he never recommended.

Dr. Carlyle mentioned a case which had recently come under his notice in the country not far from Carlisle, where he had seen a child under the influence of a narcotic showing the appearance which this child presented. He was not attending the child at the time, but attending the mother. The people in the house acknowledged that, as the child was restless and they could not keep it quiet, they gave it something. That showed what people would do. They could not be bothered with the child at night when the mother was ill, so they gave it narcotic.

The Coroner said that there was no doubt that the law required persons dealing in these drugs to exercise certain caution.

The foreman inquired whether such a drug should not be labelled poison.

Mr. Parker replied that after this he should label it so.

Sarah Graham, mother of the mother of the child, with whom she lived, having been sent for, stated that she went to Mr. Parker's and asked for some syrup of poppies one day last week, taking a bottle with her. She asked for Mr. Parker, and asked him if it was a safe thing to give syrup of poppies to a child that was griped, having wind on the stomach, and crying much, and he said it was, in small quantities. She asked him if it required to have a little mixture of water. He said No, it was a syrup of itself and did not require any. She then said to Mr. Parker, "How much might a small quantity be?" He said, "A very small teaspoonful if the child is very bad." Mr. Parker gave witness two-pennyworth and put it in the bottle. She told him that the child was four months old. She could not say whether the label was upon the bottle at the time. She had never taken the bottle before. She was quite certain she had the conversation with Mr. Parker. She turned back from the door after she got the medicine, and that was what passed between them. The child got a small teaspoonful. Before that it had had a teaspoonful of gin and a teaspoonful of warm water.

The Coroner said that the evidence was of a very unsatisfactory and conflicting character, but the last witness cleared herself and her daughter of any blame in the matter. They had taken the precaution of asking what might be given, and no doubt they thought that the quantity given was not likely to produce any ill effects upon the child. That relieved them from blame. Then they came to the question how far Mr. Parker had exercised the caution and care which were due from him. He had no doubt Mr. Parker believed that he might administer the quantity named without doing any harm. Therefore, he did not think they could censure him in the matter, but this case ought to act as a caution to him and to all other druggists. There was no doubt the death of the child had been caused by this poison. The questions for the jury were, in the first place, did they attach any blame to the parents; and, next, did they consider that Mr. Parker had been guilty of any want of care, or that he was exercising the judgment which he believed to be correct and was not, therefore, to be censured. All druggists in selling anything that might produce fatal consequences should be exceedingly guarded, and every one who purchased them should be cautious not to use beyond what was prescribed.

The Foreman: It would be well to have it labelled "poison."

The Coroner said there was an Act of Parliament which rendered that obligatory.

The jury then returned the following verdict:—"That the deceased died from the administration of sixty drops of syrup of poppies given by its mother, Mary Bell, medicinally, in ignorance of its poisonous properties and effects."

The deputy-coroner, D. Wightman, Esq., held an inquest last evening in Sheffield, on the body of a child five weeks old.

Mary Smith, mother of the deceased, stated that the child had been ailing for some time previous to its death; that on Saturday it was seized with a bad cough, and getting worse she sent for a neighbour, named Mrs. Simpson, who advised her to administer a little syrup of poppies. Mrs. Simpson also told her that it was quite harmless, and that she had been in the habit of giving it to her children when suffering from a bad cough. Witness went to the druggist's shop and bought some, and gave the child three-parts of a teaspoonful. She guessed the quantity, but had no idea what a dose of it was. She nursed the child for an hour and a half, when it fell asleep, and was taken to bed. It remained there until four o'clock on Sunday, when witness became alarmed because of it not awaking. On making some inquiries witness was told that she had given the baby rather too much. On looking at the child later on, witness thought it was dying, and immediately went for a doctor, who told her it was dead. Witness further stated that on Sunday morning she gave one of her children, three years of age, a teaspoonful, but that it had done it no harm.

Mr. Smith, surgeon (the medical gentleman who had seen the deceased), said the symptoms were such as would be exhibited by any person who had died from an overdose of an opiate. A teaspoonful of syrup of poppies would be sufficient to poison two or three children of the age of deceased.

A verdict to the effect that "Deceased had died from an overdose of poison, administered with no felonious intention," was returned. The mother of deceased and Mrs. Simpson were then called in the room, and the jury, through the coroner, administered a very severe reprimand to them both for their want of caution, and recommended them to be more careful in future.

Obituary.

SIR RODERICK IMPEY MURCHISON, BART., K.C.B., LL.D., D.C.L., F.R.S., ETC.

This celebrated geologist and geographer died at his residence in Belgrave Square, on Sunday, October 22nd, aged nearly eighty years. He was the eldest son of Mr. Kenneth Murchison, of Tarradale, in Ross-shire, and his wife Barbara, a sister of the late Sir Alexander Mackenzie, Bart., of Fairburn. He was born on the 19th of February, 1792, and received the early part of his education at the Grammar School attached to Durham Cathedral. Afterwards he studied for a few months at the University of Edinburgh. In 1807 he obtained a commission in the army, and, in 1808, served in the 36th Foot with the forces in Spain and Portugal under Lord Wellington, afterwards on the staff of his uncle General Sir Alexander Mackenzie, and finally as captain in the 6th Dragoons. He took part in several of the most important battles, carrying the colours of his regiment at Vimiera, and shared in the dangers of the retreat to Corunna under Sir John Moore.

At the conclusion of the war, following out a suggestion of Sir Humphry Davy, he turned his attention to the study of physical science. His first contribution to the literature of the branch of science with which his name afterwards became so closely associated, was a paper read by him before the Geological Society in 1825, on the "Geological Formation of the North-west Extremity of Sussex and the adjoining parts of Hampshire and Surrey." In 1826 he was elected F.R.S. After some years of investigation, at home and abroad, Mr. Murchison published the conclusions at which he had arrived concerning what he designated the Silurian system; for which he afterwards received the Copley medal of the Royal Society.

In 1846, with M. Verneuil, he commenced a geological survey of the Russian empire, under the countenance of the Imperial Government. Upon presenting his first report, the Emperor Nicholas bestowed on him a decoration and a colossal vase of Siberian aventurine, mounted on a porphyry column, and, three years afterwards, on the completion of the survey, conferred upon him the grand cross of the order of St. Stanislaus.

In 1854, Mr. Murchison published his best-known work, 'Siluria; or, the History of the oldest-known Rocks containing Organic Remains, with a brief sketch of the Distribution of Gold upon the Earth." This leads us to mention that although the discovery of gold in Australia was practically effected by others, the presence of the precious metal in the mountain ranges of that continent, was previously inferred by Sir Roderick Murchison, from their similarity to the Ural Mountains. In his address as President of the Geological Society, in 1844, he predicted the discovery of gold in Australia; and, in 1846, six years before that metal was practically worked there, he addressed a letter to the President of the Royal Geological Society of Cornwall, inciting the unemployed Cornish tin-miners to emigrate and dig for gold in Australia.

Sir Roderick, having acted for five years as Secretary of the Geological Society, became its President in 1831–2, and, again, in 1842–3. He assisted in the formation of the British Association, acting for several years, and presiding over its meeting at Southampton in 1846. In 1844 he was elected President of the Royal Geographical Society,—a post which he held with a few intervals until recently, when he was succeeded by Sir Henry Rawlinson. The persistency with which he has advocated the necessity of sending assistance to Dr. Livingstone, and the faith that he has evinced in the safety of that traveller are too well known to need more than mention here.

In 1855 he succeeded Sir Henry de la Beche as Director of the Museum of Practical Geology. He was also a Trustee of the British Museum and Director-General of the Geological Survey of the United Kingdom.

In 1863 he was nominated K.C.B., and created a baronet in 1866. From the Universities of Oxford, Cambridge and Dublin, and nearly all the learned societies of the Continent, he received recognition of his services to science.

Sir Roderick Murchison married in 1815 a daughter of the late General Hugonin, who died in 1869 without issue; the title becomes extinct. Sir Roderick was seized, two months since, with loss of speech and difficulty of swallowing, which symptoms, however, gradually abated. On the Thursday previous to his death he caught cold while taking a drive, which brought on bronchitis, under which he sank.

CHARLES BABBAGE, F.R.S.

Death has removed a great mathematician and mechanician in the person of Mr. Charles Babbage. Born in 1790, he received his early education from the Rev. Stephen Freeman, of Forty Hill, Enfield, Middlesex, where he had for a schoolfellow the late Captain Marryat, R.N., the novelist. He entered early at Trinity College, Cambridge, and took his B.A. degree in 1814. He did not compete for a Wranglership, as he believed that the late Sir John Herschel was sure to secure the highest place on the list, and Babbage coveted no other; but in 1828 he was nominated to the Lucasian Professorship of Mathematics in his old university, a chair which he held eleven years.

While yet a student at Cambridge he was associated with the late Sir John Herschel and Dean Peacock in advocating the introduction of a knowledge of the more refined analytical methods of Continental mathematicians amongst English students. The result was the formation of the so-called "Analytical Society," and to these efforts may be attributed, in no small degree, the high position now assigned to English mathematics.

Besides some literary work undertaken jointly with the above-mentioned gentlemen, Mr. Babbage published, in 1834, his extremely correct and well arranged 'Tables of Logarithms,' and the difficulty of securing accuracy in the working out of such tables on a large scale seems to have first suggested to him the work by which his name is now best known, the construction of a calculating machine. Having been promised Government assistance, he visited the principal centres of machine labour in this country, and on the Continent, studying the various forms of mechanism and the work performed by each. He then set to work upon his "Difference Engine," and by 1833 had so far advanced in its construction that he was enabled to demonstrate satisfactorily the practicability of his scheme. But as the work went on Babbage's aims were extended; he contemplated also an "Analytical Machine." The Government were alarmed at the possible expense of the experiments; some differences arose with the engineer who had assisted him in the manufacture of the intricate machinery, and the whole project was abandoned, after it had cost its inventor some thousands of pounds from his private purse. The engine and the drawings, after an offer from the Government that they should remain as his property had been declined by Mr. Babbage, were presented, in 1840, to King's College, London.

An able work on 'The Economy of Manufactures and Machinery (1832),' containing the results of the investigations before alluded to, 'A Ninth Bridgewater Treatise,' designed to combat the thesis that the study of mathematics is unfavourable to religious faith; 'The Decline of Science,' and 'Passages on the Life of a Philosopher (1864),' of an autobiographical character, are a few of the other works for which we are indebted to Mr. Babbage. In 1832, he contested unsuccessfully the borough of Finsbury in the advanced liberal interest.

Mr. Babbage died towards the end of last week, at his residence in Dorset Square, in his eightieth year.

Review.

ON THE STUDY AND VALUE OF CHINESE BOTANICAL WORKS; with Notes on the History of Plants and Geographical Botany from Chinese Sources. By E. BRETSCHNEIDER, M.D., Physician of the Russian Legation at Peking. Illustrated with eight Chinese Woodcuts.

Though Dr. Bretschneider professes to be neither a sinologue nor a botanist, he has collected together in this pamphlet of only fifty-one pages some valuable notes on Chinese plants, and their uses. He tells us at the commencement that his object has been to show in what manner the Chinese treat natural science, and specially botany, and what advantage can be drawn by European *savants* from the study of Chinese botanical works.

We have not space to consider this interesting pamphlet in detail, we must therefore content ourselves with a glance at some of its most important and interesting features. The author says, "The Chinese knowledge of plants is as old as their medicine and agriculture, and dates from remote antiquity. In ancient Greece the first botanists were the gatherers of medical plants. In the same manner the ancient Chinese got acquainted with plants for the most part in their application to medical purposes. There is a tradition amongst the Chinese, that the Emperor Shêu-nung, who reigned about 2700 B.C., is the father of agriculture and medicine. He sowed first the five kinds of corn and put together the first treatise on medical plants in a work known as *Shên-nung-pên-ts'ao-king*, classical herbal of Shen-nung (generally quoted by Chinese authors under the name of *pên-king*), which became the foundation of all the later works on the same subject. This is a small work of three chapters, and enumerates, according to the Pên-ts'ao, in all 347 medicines; 239 of them are plants, for the most part wild-growing plants, but only very few cultivated ones. It follows from the accounts given by Li-shi-chêu of the work (preface of the *Pên-ts'ao-kang-mu*), that at first it existed only in verbal tradition. It is not known at what time the *Shên-nung-pên-ts'ao* was first written down, but there can be no doubt that it is one of the most ancient documents of Chinese materia medica.

"Another very ancient work which gives accounts of plants, known by the Chinese in ancient times, is the Rhe-ya, a dictionary of terms used in Chinese ancient writings, which, according to tradition, has been handed down in part from the twelfth century B.C. The greatest part, however, is attributed to Tsu-sia, a disciple of Confucius." In this work, it appears, nearly 300 plants, and as many animals, are enumerated; and drawings are also given. The first purely botanical work in the Chinese language seems to have been by Ki-han, an author of the Tsin dynasty (265–419); after this came numerous works on materia medica and plants, till the appearance of the *Pên-ts'ao-kang-mu*, which is the type of all the Chinese productions of this class. It contains extracts from more than 800 preceding authors, and was published at the close of the sixteenth century, having occupied Li-shi-chêu, its author, thirty years in its preparation.

Though, as we have seen, some attention has been given by the Chinese to the natural history of their country, the properties and applications of the several products have never been properly considered. Dr. Bretschneider remarks that the whole of the Chinese medical science is nonsense; their practice is, for the most part, not the result of experience. They have neither studied anatomy and the physiological functions of the human body, nor have they investigated, free from prejudices and superstition, the effect of their medicines. The art of healing in China is nearly in the same state now as it was forty-six centuries ago. The terms used in Chinese medicine to designate the action of medicines are quite as intelligible to the European as to the Chinese physician. As illustrating this, the following passages, which appear in every Chinese book on medicine, are cited :—

"All medicines that are sweet belong to the element earth and affect the stomach; all medicines that are bitter belong to the element fire, which enters the heart," etc.

"All medicines, on account of their properties that are cold, hot, warm, and cool, belong to the *yang*, or male energy in nature; while their tastes, as sour, bitter, sweet, acid, and salt, belong to the *yin*, or female energy."

Another passage, which we quote, illustrates the singular minds of these remarkable people :—

"The upper and lower, the internal and external, parts of medicinal plants have each their corresponding effects on the human system. The peel or bark has influence over the flesh and skin; the heart (pith) operates on the viscera, etc. The upper half of the roots of medicinal plants has the properties of ascending the system, while the lower half has that of descending."

Besides the use by Chinese physicians of products having no active properties whatever, it is remarkable how indifferent they are as to the quality of the articles they use. The means of preserving drugs in a Chinese shop are such, that many of them soon lose their efficacy, if they ever had any. In the neighbourhood of Peking there is to be found an abundance of excellent peppermint, containing much more volatile oil than our European plants; but the exsiccated plants, obtained from the Chinese druggists, differ scarcely from hay. It is likewise difficult to find in the Chinese apothecaries' shops rhubarb of good quality. Although the best rhubarb in European commerce is that brought from China, that used commonly in China is worm-eaten and of little value.

The *Soja hispida*, commonly known as the Soy bean, appears to be a food plant of some importance in China. Three varieties are known, a black, a white, and a yellow sort. This plant is much cultivated in tropical Asia for the purpose of making the well-known sauce called Soy, which is valued perhaps as much by Europeans as Asiatics for flavouring dishes. The Chinese, moreover, make a kind of bean curd in large quantities from the seeds. The beans are macerated in water, and then pounded together into a pulp, the liquid matter is filtered and some gypsum added, in order to coagulate it; when thus prepared, it is of a jelly-like consistence, and is much prized. In Manchuria large quantities of these beans are produced, and are employed chiefly for the expression of oil which is used both for cooking and for burning in lamps. The residue of the beans after pressure is formed into cakes, which are exported to Swatow for manuring the sugar plantations.

Amongst Chinese fruits, the most popular is the jujube (*Zizyphus*, spp.). Several sorts are known; the largest and best being called Chinese dates. The dry spring branches of some of these shrubs, and *not* those of *Caragana spinosa*, as has been described in many European works, are used, our author tells us, for protecting the tops of the walls of prisons and other official buildings.

These are a few illustrations of facts about Chinese plants which we do not remember having seen in European works.

The author gives a glance at what has been done by Europeans in the matter of Chinese drugs, and pays a well-merited tribute to Mr. D. Hanbury's 'Notes on Chinese Materia Medica,' published in this Journal.

The pamphlet is illustrated with eight plates,—Chinese drawings of plants,—and was printed at Foochow.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

The Council of the North British Branch of the Pharmaceutical Society.

Sir,—The letter of "M. P. S." in your publication of Saturday is so inaccurate, and so full of irrelevant matter, that it scarcely deserves either notice or reply.

I would, however, suggest, in order that the correspondence which has now continued for so long regarding the origin and position of the Council of the North British Branch of the Pharmaceutical Society be brought to a close, or that at all events an undoubted and incontrovertible authority may be given for its existence,—the following course be adopted by all those interested in the matter, but especially the gentleman who still mysteriously shrouds his name and locality under the three capitals "M. P. S."

The Journal is undoubtedly the official organ of the Society, but instead of going *back a few volumes*, I would respectfully ask your readers to get Volume XII., and, turning to page 530, read an account of the second anniversary of our branch in Edinburgh, held on *4th April*, 1853, and, with the same book of reference before them, further ask a perusal of the Annual Report of the London Council (folio 573), held in Bloomsbury Square on the *18th May*, 1853. Our constitution and recognition are so fully set forth in these pages, and emanating, as the remarks on the twelfth anniversary of the Society do, from the Council in London, I apprehend nothing more convincing will be required to set at rest the feeling of jealousy which has been recently manifested by a few of our members for reasons which appear to me to be as uncalled for as they are unfounded.

John Mackay.

Edinburgh, Oct. 23rd, 1871.

[*** We have no desire to enter into the merits of this question, which appears to be more suited for consideration by the Council of the Society; but in reference to the letters which have appeared we must, in fairness, state that our correspondent "*M. P. S.*" was in error as to the time when the title "North British Branch" was first adopted, as will be seen by reference to the reports mentioned by Mr. Mackay. The correspondence on this subject must now be closed, so far as this Journal is concerned.—Ed. Pharm. Journ.]

Improved Tincture Press.

Sir,—Will you kindly insert these few lines on a subject which appears just now to be attracting considerable attention, viz. the screw tincture press?

In order to make my meaning clearer, I will begin by explaining in detail the principles on which the mechanical advantage of the screw-press rests.

This implement is a compound of two simple machines,—the wheel and axle and the screw; the first being a modification of the lever, and the second of the inclined plane.

Usually only two spokes are substituted for the entire wheel, although Messrs. Hayward Tyler and Co.'s new press is an example to the contrary.

The mechanical advantage (A) of this part of the press is the ratio borne by the radius of the wheel to the radius of the axle, or more correctly, by the length of the spoke or arm to the radius of the screw.

Let these be represented by R, r;

$$\text{then } A = \frac{R}{r}$$

and, multiplying each term of the fraction by 2 and by 3·1416, we get—

$$A = \frac{C}{c}$$

where C, c represent the circumferences of the wheel and of the screw respectively, since twice the radius of any circle, multiplied by 3·1416, gives the circumference.

Also the mechanical advantage (B) of the screw is the ratio of its circumference to the pitch or the distance between the threads (P), that is—

$$B = \frac{c}{p}$$

The mechanical advantage of the compound machine is the product of those of its parts, or

$$A . B = \frac{C}{c} \cdot \frac{c}{p} = \frac{C}{p}$$

= the ratio of the circumference of the circle described by the arm to the pitch of the screw, as stated by Mr. Umney.

I may illustrate this by giving the dimensions of my own press,—a half gallon one, by Maw, Son and Thompson,—as also for the sake of comparing them with those of presses by other makers:—

Pitch of screw . . . . . . $\frac{3}{16}$ in.
Total length of levers . . $14\frac{3}{8}$ in.

In estimating the power of the press, the arm should be measured from the centre of the screw to the point where the force is applied; which, it is clear, cannot be the extremity of the lever, but must be the point through which the resultant of the forces exerted by the fingers passes.

Practically I believe this coincides with the point of greatest thickness in the arm, and I find that, in the case given, this is distant from the centre of the screw $5\frac{1}{2}$ inches, therefore, the pressure obtained by applying a force of 50 lb. to the arm

$$= \frac{50 . 5·5 . 2 . 3·1416}{\frac{3}{16}} = 9215 \text{ lb. or rather more than 4 tons.}$$

This is abundantly sufficient, unless carefully managed, to burst the cylinder; and so far as my experience goes, presses are most frequently disabled from this cause, and not, as Mr. Staples suggests, from the bending or breaking of the screw.

The suggestion made by the same gentleman that strong block-tin would answer for the cylinder of a press made on his principle, seemed to me inconsistent with the pressure which he calculates is to be obtained, viz. 30 tons; and, on examining his account of the model, I find that he claims an additional advantage obtained by reducing the bulk of the screw; this is a mistake, as an inspection of the expression given above will show;

$$\text{if } AB = \frac{Cc}{cp}$$

it is evident that no increase or diminution of c, the circumference of the screw, will affect the value of AB.

Whether he is right or wrong in assuming that the power is doubled by the employment of two screws, I will not pretend to decide; but it is self-evident that one assistant cannot work both screws at once, and, also, that unless the force is applied alternately to each screw in rapid succession, it will act obliquely instead of perpendicularly.

In conclusion, I hope that among your correspondents some will be found undeterred by Mr. Staples's epithet of "unprofitable," from entering upon a "discussion of the theoretical power of the screw-press," with a view of clearing up this and other doubtful points.

J. Fred. Brown.

Sir,—Would Mr. Staples kindly inform me whether he has at any time driven his press to the enormous force of, say, twenty tons, not to speak of his latest computation? To my way of thinking, after taking into consideration the shape of his cross-beam, it seems but strange that his working model should have existed for so many years without meeting with anything more fatal than one case of undue violence. I would venture to suggest, therefore, to those who purpose getting presses made after his design, to have them made with more depth in the centre of the cross-beam, and also sufficient room in the same for the play of the male screws.

Warrington, October 24th, 1871. C. E. D.

Sir,—When I wrote the description of my press, it was to give freely to the world the benefit of an implement on which I had bestowed much thought, care and labour before I even produced the rude model from which my sketch was taken, and which I have found from experience to be very simple, convenient, of very great power, and last, though not least, so inexpensive as to be within the reach of every chemist; for I believe, with a fair division of labour, it could be produced at a cost much below that of the cumbersome and inefficient implement in general use. And there, I had thought, my duty ceased; I neither expected nor desired to be drawn into this controversy; but I am prepared to maintain my opinion while I think I am in the right. Now, the issue between Mr. Umney and myself is limited to the power applied to the lever, and I am in hopes of convincing him that my estimate is nearly correct. As Mr. Umney again quotes Professor Rankine, I must again remind him that such an excellent authority would not have given the same estimate of power, for intermittent labour, with ample time to recruit the strength, as he gives where it is continuous and exhaustive. I have just now taken the opinion of a gentleman who has looked at and handled my press, and thinks my estimate of 100 lb. within the mark, as he could apply 200 lb. (not continuously, but at intervals); being a mathematical scholar, well up in the sciences, I think his opinion of some value. But as I said last week, do not talk about a thing if it can be done; an ounce of practice is worth a pound of theory. I challenge Mr. Umney to the following test, in which, perhaps some other of your readers will aid us. Let the press, when in actual use and a fair amount of power applied, be turned on its side with the lever projecting horizontally, load the end and note the weight required to move it; if Mr. Umney's theory of 50 lb. applied by the two hands to both arms of the lever is correct, one arm should move with little more than than 25 lb.; I say, "try if you can do it."

October 24th, 1871. C. A. Staples.

The Preliminary Examination.

Sir,—There was a mournful sentence in the last Pharmaceutical Journal. "First, or Preliminary Examination. Two hundred and twenty-two candidates presented themselves for this Examination on the 2nd of October, eighty-two failed."

Something is wrong. Either apprentices and young students do not care a straw for the subjects on which they are engaged save just so far as their study may enable them to pass an examination, or else they are miserably trained.

As every little helps may I be allowed to say a word.

Before I was an acting Examiner I amused myself by preparing private friends for the Preliminary. It was then vivâ voce. I did this—First I went to the nearest Day School, connected either with Church or Chapel, and engaged a *junior* master to attend two nights a week for one hour each time, to teach Arithmetic. Secondly, I asked a curate to instruct in English Literature and Composition. The advantage of having an educated gentleman to explain the English language cannot be over-estimated. The time was divided thus—half an hour was devoted to a rigid grind of Grammar and Composition: while during the second half hour the pupil had to read aloud some book of standard excellence—such as the Vicar of Wakefield, The Essays of Elia, Southey's Book of the Church, Ivanhoe, or the Talisman—these works being as far removed from Pharmaceutical subjects as the East is from the West—also large portions of the Bible, specially the Psalms and Isaiah—and celebrated known passages such as Addison's Papers in the Spectator.

Thirdly—I gave two morning lessons of one hour each in Latin. The time was accurately divided (the watch being on the table) into two distinct studies—Half an hour was consecrated to a thorough grind in Latin Grammar and composition: half an hour was allotted to the reading of the first book of Cæsar.

Three months' preparation was exacted. At the end of the eleventh week, an examination paper was drawn up containing eight questions on each subject—Latin, Arithmetic, and English.

Then, I forbade my student, for the next week to touch a book. I put it to his honour, for *my* sake, not to tinker up his Latin, addle himself over Arithmetic, or exhaust himself with English. I certify that I never had one failure, nor was it necessary to look to near the gulf stream to find out where the name of the candidate was inserted on the list. On a calm revision of the matter I do not see where a possibility of failure could occur.

I have written nothing original, nor indeed do my remarks seem to myself worth print—my only excuse is the dismal paragraph above quoted. I *am* my brother's keeper, and it is my duty to see after the eighty and two lost sheep straying in the wilderness. To them I say—let the dead bury their dead—let the past go: Enter once more with full hope the intellectual life and recollect the splendid motto "Ride through." Joseph Ince.

Sir,—In the Latin paper set for the candidates at the recent Preliminary Examination occurs this question, "How is the noun-adjective of three articles declined?" One of the candidates, who had been reading with me before the examination and was quite unable to understand the question, was courteously furnished, by Mr. Haselden, with this explanation, quoted from Edwards's Eton Latin Grammar (1858), "Noun-adjectives of three articles are declined like nouns of the third declension,—*e.g.* HIC and HÆC *tristis;* HOC *triste.*" Now if this be what is meant by an adjective being "of three articles," I should like to ask what declension HIC *bonus,* HÆC *bona,* HOC *bonum* resembles. I might further quote Donaldson, Smith, Arnold, and Priscian to the effect that in Latin there are no articles, and equally high authorities as to the inappropriateness of the term "noun-adjective;" but I would hasten to draw your attention to the fact, that with respect to examinations the Pharmaceutical Society is undoubtedly behind the age. Of course in the Arithmetic papers the Examiners could not go far wrong, but in the Latin and English questions there is great room for improvement. In the former subject, for example, following the text-books of the last generation—the questions are either ridiculously easy or such as will be found unanswered throughout the voluminous works of Arnold, Smith, Kennedy, etc. And in the English papers, the Definite and Indefinite Articles are pertinaciously adhered to, while the modern improvements in the nomenclature of pronouns are regarded as dangerous innovations. I do hope, Sir, that some attention will be given to this subject, so that in the future there may be more confidence in the examination-system, and less injustice towards the candidates.

You must not think I have written these lines from any ill-will towards the examiners, for I am happy to say the only gentleman who read with me succeeded in passing, though he did not answer the question quoted.

W. E. SNELL, Lond. Univ.

PROVINCIAL EDUCATION.

Sir,—I should like to say a few words in reply to Mr. Mason's letter in last week's Journal.

I do not know whether Mr. Mason is a practical man with regard to pharmaceutical education, but from his letter I should rather think that such is not the case. He does not seem to agree with Mr. Smith's plan of making the Minor the main object of provincial associations, but rather seems to think that the great desire of apprentices is to "cram."

Now I maintain that such is not the case. From what I know of provincial associations, I have found that the large majority consists of the apprentices, and the Preliminary being passed, what have they next to do but to study for the Minor, and such being the case, what becomes the principal object of associations but the Minor? And as for cramming, I know from my own experience of apprentices that nine-tenths of them abhor cramming, and honestly desire to thoroughly master the required subjects. To say that apprentices must cram, is to say that those who enter our ranks are beneath ordinary traders in mental abilities; and yet Mr. Mason, I have no doubt, would declare that the rising pharmacist is in every respect a superior man. So long as the Minor remains compulsory and the Major permissive, the candidates for the Minor will greatly exceed those of the Major; but to make the difference less, let every attention be paid to apprentices and their studies by provincial associations, and the result will greatly exceed their expectations.

October 24th, 1871. SPECTATOR.

TRADE LATINITY.

Sir,—The budding genius of Dr. Kitto was annoyed at the business announcements of his neighbourhood, "Logins for singel men," "Rooms to leet, enquair withing," and he prepared neat and accurate substitutes, which he sold at a very modest rate. If some person would perform a similar office for our trade Latinity, it might save us from many a glaring absurdity, and remove a stumbling-block from the way of those unfortunate apprentices whose "Preliminary" succeeds their indentures. A "happy family" is congruity compared with the confused numbers, genders and cases of trade lists and advertisements. In a short price-list of pharmaceutical preparations only, I have counted no less than two dozen errors in that portion which remains in type from month to month. How many others the friendly contractions hid I cannot conjecture. In an advertisement a short time since, often repeated, a youth fresh from school, with the Concords firmly impressed on his mind, would have had no difficulty in rendering the Latin* for creeping solution of wheat, though he might wonder whether the preparation was intended for the microscopic exhibition of animalcules analogous to "eels in paste;" but he would be utterly unable to construe "liquor quinæ ammoniata."

It is, however, the misfortune of many persons to be obliged to use a language very foreign to them. But the insertion of a Latin motto on the title page of the price list of a chemists' association must be optional, and it would not be hypercritical to demand correctness. In such a sentence† I find gratuitous accents are so placed that an adjective is made to appear an adverb, and in two instances neuters plural of the second declension and accusative case are converted into ablatives singular of the first declension, governed by the preposition *per!* If these errors are all to be laid upon that scapegoat, the printer's devil, surely some means of exorcism should be found. Professional men, and the educated part of the public, whose eyes may perchance fall upon such examples of Latinity, will be apt lightly to estimate our claim to be considered an educated body.

HENRICUS.

J. Abbott.—Our correspondent appears to confound *Nardostachys Jatamansi* (the Spikenard of the ancients) with Sumbul. To the latter alone apply the remarks of doubt as to its botanical origin. By some it has been supposed to be the root of a Valerianaceous plant, probably of *N. Jatamansi,* but by others, and more recently, it has been attributed to an Umbelliferous plant. See PHARM. JOURN. 3rd Ser. Vol. I. p. 807.

H. Sparshott.—Your letter and enclosure has been forwarded to the publisher.

"*Give and Take.*"—See Mr. Allchin's paper on "The Preservation of Leeches," PHARM. JOURN. 1st Ser. Vol. XV. p. 453.

A. P. S.—We would recommend you to communicate with Mr. F. Baden Benger, the Hon. Secretary of the Manchester Chemists and Druggists' Association.

Dispensing Charges.—*Mr. W. M. Betts,* in reply to Mr. Leay's comments on a former communication of his (*ante,* pp. 260, 300), says that it is an absurdity to call each item in a prescription a pennyworth, and that anything like a business establishment would ridicule the very thought. He asks whether the "pet of the period, the Intelligent British Artisan," would fill a bottle with pure water for nothing? and expresses an opinion that if pharmacists stand behind the counter and serve the public for nothing, the public will estimate their worth at its proper value.

"*Inquirer.*"—There is such an examination. For information respecting it you should apply at Apothecaries' Hall.

J. T. Chapman.—Your letter has been handed to the Secretary.

C. Glaister.—The advertisement has been forwarded to the publishers.

T. Cragg.—Candidates for the Preliminary Examination in London and the provinces must present themselves on one of the regularly appointed days, viz. the first Mondays in January, April, July and October.

P. E. Fox.—A recipe for making green fire will be found in Vol. I. p. 357 of this series.

A. Williams.—6 x 6 [*pollices*=] inches.

"*Scribo.*"—For information as to the preparation of Pancreatine, you may consult the paper by Dr. Dobell on "The Special Action of the Pancreas on Fat and Starch," read before the Royal Society, and published in the 'Proceedings of the Royal Society,' vol. xvi. p. 209.

T. Hambridge.—The derivations are not positively known.

T. Small.—Candidates who pass their examination in Edinburgh may compete for the prizes given in London at the end of the Session.

* Liquor Tritici Repens" (*sic*).

† "Longum est iter per præceptâ, brevè et efficax per exemplâ" (*sic*). Price list of the Midland Counties Chemists' Association, Revised.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. T. Cragg, Mr. G. C. Jones, Mr. Prowse, Mr. J. A. Wilson, Mr. J. Tully, Mr. J. T. Miller, Mr. B. Keene, Mr. J. J. Matthias, Mr. E. Nuttall, Mr. W. Watts, Mr. J. H. D. Jenkinson, A. B., C. E. D., "Chemist's Assistant," "A Chemist," "Nil Admirari," "Spectator."

A NEW EXCIPIENT FOR PILLS.*

BY J. B. BARNES.

Soluble cream of tartar is a solution of bitartrate of potash in biborate of soda, boracic acid, or biborate of soda and tartaric acid; either of these compounds, when evaporated to the consistence of mucilage, is heavy and adhesive.

Having had my attention directed in an especial manner to the medicinal properties of sulphur, I was naturally led to reflect upon the inelegant mode of its administration. It is true the sulphur electuary of the Pharmacopœia is an improvement upon the horrible mixture of sulphur and treacle in common use, but still there is the grittiness and the mess. Sulphur is generally taken in combination with bitartrate of potash; and the soluble modification of this salt possessing the above-mentioned properties, it suggested to my mind the employment of so appropriate an excipient for the conversion of this substance into pills; and I venture to suggest that pills so prepared might be employed when this substance is required to be taken in doses of between four and twenty grains.

The samples of sulphur pills on the table, prepared respectively with the sublimed and precipitated varieties, contain in each four or five grains, together with one grain in twelve pills of gum tragacanth and a sufficient quantity of soluble cream of tartar. The pills containing four grains of precipitated sulphur are smaller than it is possible to prepare them with any of the ordinary excipients, being not quite so large as a five-grain compound rhubarb pill, and as hard as a lozenge. When placed in tepid water, the soluble cream of tartar speedily dissolves and the sulphur is set free.

I propose to call them "sulphur and cream of tartar pills."

I have also prepared five-grain pills of hydrate of chloral, Dover's powder, nitrate of potash, chlorate of potash, citrate of potash and gallic acid. The formula used for the chloral pills is as follows:—

Hydrate of Chloral	1 drm.
Soluble Cream of Tartar (of the consistence of mucilage)	2 drops.
Gum Tragacanth	3 grs.

Mix and divide into twelve pills. These require to be kept in contact with lycopodium. They keep their form perfectly and gradually harden; minute glistening particles of the drug have, however, made their appearance on the surface of these pills, and also on the bottle, indicating that they should not be made too long before they are required to be used.

In the conversion of Dover's powder into pills, soluble cream of tartar only was used; for those of nitrate of potash and chlorate of potash one grain to the drachm of gum tragacanth was employed, in addition to the soluble cream of tartar; for those of citrate of potash and gallic acid took two grains of the gum to each dozen. The nitrate of potash, chlorate of potash, gallic acid and citrate of potash pills were dried at a gentle heat; the three former keep well in boxes; those of citrate of potash should be kept in bottles in contact with lycopodium. With the exception of the gallic acid, all these pills are smaller than an ordinary five-grain pill.

I have also prepared four-grain pills of chloride of ammonium, using the soluble cream of tartar, and one-sixth of a grain gum tragacanth in each; these should also be kept in well-closed bottles.

The one-grain camphor and three-grain quinine pills on the table contain, in addition to the soluble cream of tartar, one-twelfth of a grain gum tragacanth in each. The gallic acid pill, as might have been expected, is large but hard, keeps well, and makes a more satisfactory pill than when glycerin is used; all these pills are firm, dissolve quickly in tepid water, and, what is of considerable importance, present a good appearance.

I thought it probable that by boiling trisnitrate of bismuth in a solution of soluble cream of tartar a soluble bismuth pill might be prepared, but I find it takes seven grains of the dried salt to dissolve one grain of the trisnitrate. I have, however, prepared four grain pills of this body, which contain half a grain of the trisnitrate in each.

* Read at the Evening Meeting of the Pharmaceutical Society of Great Britan, Nov. 1, 1871.

CINCHONA-TREES GROWN IN INDIA.*

BY JOHN ELIOT HOWARD, F.L.S., ETC.

I received in the course of the past summer, by favour of the Indian Government, two trees, complete with roots, trunk, branches and leaves, not living, but packed in cases. I had requested to be furnished with these for the purposes of chemical analysis, in order to clear up some points which yet remained (in some measure) undecided. I reserve till another occasion what I may have to say on the leaves, and proceed to some observations on the trees themselves, which both grew in the Government gardens, Ootacamund, and were cut down near the close of last year, after a growth of about five years.

The first was a tree of *Cinchona succirubra*. The height from the base to the summit of what may be called the stem, was 10 feet, and above this, there may have been from 6 inches to a foot of young and merely succulent vegetation. The girth of the base of the trunk was 20 inches, of the summit, where cut from the succulent part, 2 inches. The weight of the roots was 8 pounds; of the trunk, 12 pounds 8 ounces; of the branches, 4 pounds 8 ounces; of small branches, 3 pounds 12 ounces, making together a total of 28 pounds 12 ounces. This tree was four and a quarter years old, according to Mr. Broughton's reckoning, probably from the time it was planted out. The second was a tree of *Cinchona officinalis*, the height of which I estimate at 9 feet 3 inches, with less immature vegetation above. The girth at the base was 11 inches; at the summit (as above), 1 inch. The weight of the roots was 3 pounds 8 ounces; that of the trunk was 5 pounds 12 ounces; that of the branches, 13 ounces, making altogether 10 pounds 1 ounce.

These figures show that the *C. succirubra* will develope in the time at least three times faster than the *C. officinalis*, a circumstance accounted for by the great abundance of its leafy branches, whilst the general aspect of the Loja-tree, a stem bearing a tuft of vegetation on the summit, has caused it to be compared to the Aloe. Thus we have, in this case, a weight in the *officinalis* of only 13 oz.

* Read at the Evening Meeting of the Pharmaceutical Society of Great Britain, Nov. 1, 1871.

branches to set against a total of 132 oz. of branches in the former, or more than ten times the amount. The weight of the trunk itself proves to be in each case about 50 per cent. above that of the roots. I am not able to state the comparative weight of the bark of the two trees, which could not be removed without spoiling the specimens, except a portion of the *C. succirubra* for chemical examination. It is thicker in the *C. officinalis*. This tree is said to be five years old.

It is important to remark that this rapid development of the *succirubra* by no means necessarily implies a corresponding success in the cultivation of this species. If the quinine found in the bark of the *C. officinalis* prove to be three times the amount in the same time, and of purer quality than in the *C. succirubra*, and supposing the relative weight of the bark to be the same, the preferential price would be given for the one-third weight of *C. officinalis*. The average of a parcel of *C. succirubra* recently cut, and now coming home, is, I am informed, *under* 1 per cent., but the average of the *C. officinalis* coming in the same parcel is *over* 3 per cent. of sulphate of quinine.

At the first sight I was struck with the general resemblance of the external aspect of the two trees to the same sorts grown in their native climate. This was especially the case with the *C. officinalis*, which seems in all respects to be the exact reproduction of the plant named by Pavon *Cinchona Uritusinga*, but which has now been restored by Dr. Hooker to the old Linnean designation. It will be seen on examination of the marked and peculiar rugose bark of the two specimens placed side by side—one gathered by Pavon one hundred years since in South America, the other recently cut in India—that even in colour and the adherent lichens they are as much the same as if they had been taken from the same tree. This is the more remarkable, because the other forms of the Loja bark are remarkably and characteristically different. I lay some stress on this, because it appears to me that such permanent characteristics as the bark affords should always be taken into account in the botanical discrimination of these otherwise nearly allied forms.

A second general observation presented itself on closer inspection, namely, the occurrence on the lower part of the trunk of each tree of a peculiar white fungus occupying the crevices of the bark; and, as I afterwards found, penetrating into the very wood itself, and occupying cracks and fissures in the same. I look upon this as a very bad indication; and, judging from the analogy of beech-trees similarly affected in plantations here, should regard it as an almost fatal sign. I hope that it does not generally occur in the Indian plantations, but that its accidental existence in these trees may, in part, have led to their selection for the purpose of eradication. I present to the Society a portion of bark of the under part of the stem of a Calisaya tree grown in Java, and "infected by mycelium." This arose, as is well known, from the decaying portions of old roots and trunks of the uprooted forest, in place of which the cinchona-trees were expected to flourish. I do not know whether the same or a different cause may have led to the existence of this fungus on the trees at Ootacamund. Mr. M'Ivor explained this evil to me as arising from the earth being heaped up for some inches around the base of the trunk, in which case it may have had a simply local origin. It is well known that all the cinchonæ are impatient of water at the roots, and if the water lodges in the least in the subsoil (Mr. Clarke remarks at Darjeeling), although it may be a place where there is an excellent fall and surface drainage, there is a bald patch in the plantation.* I should certainly look to the roots.

I now turn to the results of chemical examination. My attention had been arrested by a passage,† in which, after speaking of the permanence of the alkaloids in the bark after it has been removed from the tree, Mr. Broughton remarks, "in very singular contrast to this is the fact, that quinine and cinchonidine are not to be found in the bark of trees *that have been dead a short time.*

My own experiments with barks that have been a century in this country leads me to suppose that no change whatever had taken place in the alkaloids, and I was naturally anxious to ascertain what could lead to such a result as we have been contemplating. Has the plant, I said to myself, withdrawn these alkaloids in order that they might be turned to other account in the failing health of the plant? Mr. Broughton also, in a private letter to myself, speaking of the trees sent, says, "I am a little doubtful whether the quality of the bark will not be damaged by allowing it to dry on the tree, since I find that if a tree dies from any cause, its bark loses its alkaloids in a few weeks."

I therefore, on receipt of the trees, separated enough of the bark of the *C. succirubra* to ascertain this point, and soon satisfied myself that no such injurious action had taken place in this case; probably because the sudden death of the tree prevented any abnormal circulation. The bark yielded me 3·54 per cent. of alkaloids, of which only 0·82 proved to be quinine, the rest cinchonidine and cinchonine,—the former pure and good, as will be seen by the sample shown; the latter, on the contrary, losing much weight in refining. The bark, in fact, resembled that taken from similar trees in the ordinary method.

The bark of the roots I have not had the opportunity of examining. It is so thin, and adheres with so much pertinacity to the wood, that it would seem lost labour to attempt its separation in any quantity in the dried state, whatever may be the case when the roots are freshly removed from the earth.

The examination of the heart-wood yielded me results analogous to that from South America, with this exception, that I found less cincho-tannic acid than in the wood from South America, and also a small portion of chlorophyll, which I have before noted in the young wood from India, as the result, perhaps, of a vigorous circulation not yet fully settled into the mature state of the tree. This may also account for a less specific gravity. I found (by ether) the same resinous-looking yellow substance which I have described in my 'East Indian Quinology.' This is capable of being split into chinova-bitter and cincho-tannic acid, and consequently, by treatment with alkalies, productive of cinchona-red, the proportion of which seems to be less in the red bark of India. The chinova-bitter obtained is pure and abundant.

I hope that the examination of the leaves may

* Report, 1st July, 1870.

† Return, No. 432, 9th August, 1870, p. 241.

afford me some topics of interest, but these must be reserved for another opportunity.

I embrace the present opportunity of introducing to the notice of the Society some carefully prepared botanical specimens of the valuable variety of *Cinchona officinalis*, known as the *lanceolate* variety. It was first pointed out by Mr. Broughton, the able chemist in charge at Ootacamund, in a report dated 17th August, 1868, and was subsequently (in 1869) shown to contain "the unprecedently large proportion of 11·40 per cent. of alkaloids and 9·75 of quinine." * My own examination of a small sample forwarded by Mr. Broughton confirmed, as to its main features, this extraordinary report; and as orders were issued and resolutions taken to increase this most valuable species, it seems to me that we should soon hear more about the success of its cultivation.

The same remark applies to the Pitayo species, first raised about the same time from seed, sent by Mr. Robert Cross. I hope that this valuable sort is not neglected.

In August, 1868, mention is also made by Mr. Broughton of the variety *Amarilla del rey* of the *C. officinalis*. If this proves still to exist, it would be well worth while to send over a selected and carefully prepared specimen of the bark. I studied this kind in conjunction with Dr. Pereira, and know that it is rich in quinine and altogether a most valuable article of the materia medica. Moreover, it used to fetch (as HO crown) a deservedly very high price in the market. Now it is impossible to procure either this or any other crown or Loja barks of the genuine sort in this country, and I have had difficulty in obtaining even a few ounces for a collection of specimens.

It is by devoting attention to such points, by encouraging the best species and by high cultivation, that the undertaking of Indian acclimatization will become one of pecuniary profit. I am glad to think that all things seem to promise an abundant return to the careful cultivator, and that the pecuniary result is beginning to be realized from shipments sent home to Europe. There can be no doubt that on the whole this great experiment is a success.

PHARMACY IN NORTH GERMANY AND AUSTRIA.†

BY THOMAS GREENISH, F.C.S.

In the early part of September I left England for a month's holiday in North Germany and Austria. Two days found me among the pharmacies of Hamburg. It was no easy matter to discover them. Every other shop had the usual outward aspect peculiar to the same trade in England; but, had it not been for the one word "Apotheke" over the door, there would have been nothing in the external appearance to denote the existence of a pharmacy within. The shop windows were little, if anything, larger than those of a private house; and there was nothing displayed in them either to attract the attention of the public or to bring "grist to the mill."

It is rarely that you enter directly from the street into the shop; the outer door is open, but the true shop door generally remains closed. There is usually one counter for retail, and another behind it for dispensing. Once inside, it is evident at a glance that the business is mainly one of prescriptions; there is an entire absence of patent medicines and proprietary preparations; counter bills recommending specifics are not seen; and all the *etcetera* that go to make up the retail of an English pharmacist find no place there. Even the ubiquitous feeding-bottle is not allowed standing-room, and one wonders how the "budding Germans" get on without them, when such a variety and so many are required in England.

The whole shop has the appearance of being one dispensing department; the pots on the shelves have their labels burnt in, those on the bottles are done in oil colour and varnished; while the dispensing-counter, with its marble top and neat dispensing scales,—for every ingredient in a prescription, excepting drops, is weighed, graduated glasses being unknown,—convey to the mind an appearance of "well to do," which subsequent observation tends to confirm. This quiet dignity and professional air contrast strongly with the very pronounced character of many of our English pharmacies. Fly labels are used exclusively, and the bottle rolled up in a piece of paper, which is twisted at the neck, is, with the prescription loose, given into the hands of the patient. To a British pharmacist this mode of sending out medicines would appear somewhat "slip-shod." Prescription wrappers are seldom seen, and the neatness considered so essential in England is unknown here. In one instance I observed a servant leave a pharmacy with a bottle of medicine in her hand; it was rolled in paper, but the label was outside, and as, just at that time, heavy rain was falling, it would be difficult to say how much of the direction was delivered with the medicine.

The prescriptions, which are written in Latin, with the directions in German, are, as a rule, more simple than those to which we are accustomed; the meagre slips of paper which contain them seem scarcely sufficient for anything very complex. The competition which prevails in England is unknown here. The practice of pharmacy is a Government concession, and the number of establishments cannot be increased without the Government permission, which is never granted unless proof be adduced that there exists a necessity for it in the increase of population. Application is then made to the minister of the medical department, and the prayer must be supported by the "Kreis Physicus," or Government medical officer for the district. This limitation of pharmacies, coupled with the fact that no class of the medical profession sends out its own medicine, throws a great number of prescriptions into the hands of the pharmacist. As a counterpoise to this privilege, he is supplied with an "Arznei-taxe," or taxed list of prices for medicine, which he may charge, but which he is not allowed to exceed. There is also an "Arznei-Mitteln," compiled by Messrs. Schacht and Laux, of Berlin; it contains the prices of those preparations which, although in general use, are not in the Pharmacopœia. It is without legal authority, yet it is accepted by the trade, and is in general use throughout North Germany.

In addition to the price of each article in the prescription, charged in accordance with the "Arznei-taxe," the pharmacist can also add a small item each for weighing, dissolving and mixing the ingre-

* Return, No. 432, p. 221.

† Read at the Evening Meeting of the Pharmaceutical Society of Great Britain, Nov. 1, 1871.

dients, and also for the distilled water; the sum total, with the bottle, being usually about two-thirds the price of the same mixture dispensed in England. In some towns a trifle extra is permitted for a more elegant label and capping-paper.

The "Arznei-taxe" would be the alpha and omega of many in England, who think uniformity of prices the great desideratum, and occupy the valuable pages of our Journal in discussing and recommending this utopian scheme. Others there are who believe that if all the dispensing were done by the pharmacist, no class of the medical profession sending out its own medicine, the "winter of their discontent would be glorious summer." Here both exist in full perfection, and that sharp competition, based too frequently on low prices alone, which in England suddenly starts up, and may at any time deprive the conscientious pharmacist of the fruit of years of labour, is not permitted in Germany. Civil Service Associations, if they do exist, may supply to their members any mortal thing from a "silk dress" to a "Bath brick," from "Cockle's Pills" to the "latest fashion in chignons;" but the dispensing of physicians' prescriptions is the province of the pharmacist alone, and the divinity "which doth hedge a king" is not more sacred than the protection afforded by Government to the legitimate dispenser of medicines.

"Obscure prescriptions" are unknown, and the equally questionable practice of prescribing preparations for which the formula has never been published finds no place in German pharmacy. The pharmacist having all the dispensing does not cultivate prescribing, he discountenances it; and the small charge made by the physician enables him to do so without inflicting an injury on his customer. An examination of the drugs, chemicals and pharmaceutical preparations is supposed to take place about every three years. It is conducted by the Government medical officer and a chemist; but, although no notice is given, somehow or other it leaks out when the examination may be expected; and hence, for all practical purposes, it is not of much value. I was invited to inspect several very complete laboratories in Hamburg, Brunswick and Berlin. Until within the last ten years every pharmacist was bound to make the preparations of the pharmacopœia in his own laboratory; since that time he has been at liberty to purchase. But the examiners still hold them responsible for the quality of every article found on the premises. In Hamburg the number of pharmacies is 46 or 48 to 200,000 inhabitants; and this number is considered to be too great, the average all through North Germany being one to about 10,000 inhabitants.

Such is an outline of pharmacy in Hamburg, and with little variation it applies to the whole of North Germany.

From Hamburg I passed on to Hanover, which, with its suburbs, has a population of about 80,000. There are 7 pharmacies. The difficulty of getting apprentices was a subject of complaint; and in matters of detail as regards pharmacy there was little or no difference between this place and Hamburg.

Brunswick came next in my route, with its population of 52,000 and 4 pharmacies; and it was remarked to me that there was great difficulty in getting assistants; and the reason assigned was that the salaries were low throughout Germany, averaging £20 per annum, and for examined men £25 to £35 a year. The position did not afford a comfortable living, and there was little prospect of getting into business. I was here informed that if by an error in dispensing, an assistant who had passed his final examination at the university caused the death of a patient, the principal was not criminally responsible, nor liable to damages in a civil action; but this was not subsequently confirmed, and I therefore think that it must have been an error, unless it applies to Brunswick alone.

I then went on to Berlin. Here, with a population of about 800,000 there are 53 pharmacies; however, this city is rapidly increasing, and before long it will, no doubt, have an addition to this number. The North German Pharmaceutical Society meets here every month, at which meetings neither apprentices nor assistants are allowed to be present. The Berlin chemists are not all connected with it. The meetings are generally held in a hotel, where a room has been rented for this purpose, and trade affairs, as well as scientific matters, are discussed. There is no regular library, but several journals are taken, among them the Pharmaceutical Journal, the *American Journal of Pharmacy*, and the *Journal de Pharmacie*; these are sent round to each member for a term of three days. The society has no special organ to publish its proceedings; the *Pharmaceutische Zeitung* is a private undertaking, and has no connection with the Berlin Society. The members pay annually a certain sum to an Assistants' Benevolent Fund for every assistant they keep. The assistants have founded an association for social and scientific purposes; but there is no systematic lecturing, or special botanical or chemical class. Assistants have no time allowed them for attending lectures. Apprentices are allowed to attend a course on botany and chemistry.

In Leipzig there are 91,500 inhabitants and 8 pharmacies, besides 2 which deal exclusively in homœopathic medicines. There exists here a chemists' association, which meets once a month and discusses trade and scientific affairs; from this society also assistants and apprentices are excluded.

To Dresden I paid my next visit, and found a great deviation from the usual character of pharmacies in North Germany, perhaps in deference to the habits of the very large number of English families always resident here. Nearly all the pharmacies had proprietary articles and patent medicines exposed in the windows; there was more of the *shop* about them; and to my mind it was a falling off in character. To a population of 150,000 there are 20 pharmacies.

With regard to pharmacopœias, there has hitherto been in North Germany a great variety. Hamburg until lately had its own, so also had Hanover; Dresden used the German Pharmacopœia for Saxony; but now they seem in a transition state, and are gradually approximating to the Prussian Pharmacopœia. Each also had an "Arznei-taxe" of its own, but in a year or two they expect to have one uniform German Pharmacopœia, and also one "Arznei-taxe" issued from Berlin. Prussia has absorbed these minor states; but at present they are like those particles seen by microscopists wriggling in the stomach of the Hydra, swallowed but not assimilated.

It is unusual for assistants whilst in a situation to attend any lectures; all this is left until they go to the university, when their whole time is devoted to study and practical work. There seemed to be no society in any part of North Germany in furtherance of the objects of pharmacy to which assistants had free access.

The hours of business are very long. Assistants are required, in summer, to be in the shop at half-past six, and in winter at seven, and to continue there until ten at night, with very little relief on Sundays; but they are allowed, usually, two afternoons a week for recreation. I noticed that, as a rule, the assistants were older than those in England. In many instances they had passed their final examination, and were fully qualified, but wanted an opening. A pharmacy in Germany realizes, on sale, a very large sum, more than the returns would warrant, or than it would be worth without the Government concession. It becomes a valuable property, less liable to depreciation than a similar establishment in England, and when there is one in the market, it is the subject of a very sharp competition.

The working details of the business of pharmacy under different conditions to those which obtain in this country, must always possess a certain amount of interest, and may generally be studied with advantage, but there are other and closely-allied subjects of more importance which demand our notice also; I allude to those laws by which the practice of pharmacy is regulated, and also to the education of the pharmacist. There are points here to which I invite your special attention. In North Germany every *candidate* for apprenticeship, before he is accepted by the pharmacist, must produce his certificate to show that he has been one year in the second class of the Gymnasium, and that he possesses those educational qualifications which entitle him to the privilege of having to serve for one year only in the army instead of for three years. The Gymnasium is the classical school of Germany,—it has six classes, the second being the highest but one. This qualification would comprise a knowledge of grammar and composition, Latin, French, history, the simple rules of arithmetic, vulgar and decimal fractions, the elements of physics and chemistry and some botany. It would be about equivalent to the Oxford and Cambridge Middle Class Examinations and those of the College of Preceptors, and until an education equal to this be insisted on by those who in this country take apprentices, it will be idle to talk of raising pharmacy in Great Britain to what should be its true position in public confidence and professional estimation. "A chain is only as strong as its weakest link," and this is the weak link in our educational arrangements. The Preliminary Examinations reveal a lamentable amount of deficient education, and result in much unhappiness and disappointment.

No amount of after cramming can compensate for the absence of that mental discipline which is the result of careful early education. This is a subject for the consideration of individual members, and the duties of the schoolmaster should not be thrown on the Pharmaceutical Society.

If pharmacy is to be elevated, our youth must have acquired *at school* such an education as will leave the *entire term* of their apprenticeship perfectly free for the acquisition of scientific knowledge and the technical details of the business, instead of wasting a large portion of it in acquiring the very rudiments of the Latin language, which properly belongs to the duties and obligations of school, and then to fail in the simplest English composition. This, or such as this, is required to place us in scientific attainments abreast of our brethren on the Continent, and the pharmacist who, *before* apprenticeship, insists on the youth possessing such an education as is implied here, will have done a splendid service to pharmacy, and have earned for himself the lasting gratitude of his brethren. We must ever remember that it is in the education of our youth that the safety of the public lies.

In Germany the apprentice is allowed his evenings for study, and his employer is bound to provide him with suitable books and to superintend his studies; he is also allowed time to attend lectures, if in a town where lectures are delivered, and for the first two years or thereabouts he is confined to the dispensing of *external* medicines. At the termination of his three years' apprenticeship, he has to pass an examination something equivalent to our *Minor*, before a board composed of the Government medical officer, a chemist and a pharmacist; if he fails, he is sent back for six months; if he succeeds, he commences his term of three years as an assistant; this also is compulsory, and, at its expiration, he goes to the university, usually Leipzig or Berlin, for three *semesters*, or sessions, equal to about one year and a half, where his work is practical and theoretical; after this, he has to undergo his final examination, which is equivalent to our Major. I have calculated the cost of these three *semesters* at the university for a German student, and think that with economy it may be done, including board and lodging, and the fees, for £80 English money. If successful, he is then qualified to conduct a pharmacy when he can get one, but must wait until a vacancy occurs.

How often is it remarked, and with truth, by business men, that assistants who present themselves with the most satisfactory testimonials and the highest scientific attainments—attainments which reflect the greatest credit on this school—are utterly wanting in the practical experience necessary for the details of business! So long as pharmacy is like Jacob's ladder, one end on earth although the other may be very high up, so long will the vulgar details of existence imperatively claim our attention. This state of things is provided against in Germany by the three years' practical work as an assistant, before the university duties are commenced and the Major examination can be passed.

There is yet another subject on which there has been some difference of opinion, viz. the age at which a young man should present himself for his Major examination. There is no stated age in Germany, but the curriculum of study provides for it. The student must *before* apprenticeship have acquired the necessary classical, mathematical, historical and scientific knowledge; and it is scarcely possible that he can have acquired it before the age of fifteen, it is usually sixteen, to which add three years' apprenticeship, and also three years as an assistant; and, this with one and a half at the university, will make him about twenty-two years of age before he can offer himself for the final examination.* I think

* It is expected that some important modifications will soon be introduced into the system of pharmaceutical education in Germany, and we purpose next week giving some details of the contemplated changes, which have been communicated by Dr. Schacht, of Berlin, who is a member of the Commission that has to deal with pharmaceutical affairs in Prussia.—ED. PHARM. JOURN.

the German student, on leaving the university, is more highly educated than the average of those who pass the Major in England, and I attribute this mainly to the early education he receives, an education on which it is easy to raise any required scientific superstructure.

I now approach some of those laws by which pharmacy is governed in North Germany. The question will very naturally occur to the English pharmacist, Is this Government concession and limitation of pharmacies an advantage to the public, or conducive to the best interests of pharmacy? The question is very difficult to answer, but some facts may be mentioned which have a direct bearing on the subject. In every place I visited, from Hamburg to Dresden, it was remarked how difficult it had become to obtain apprentices, although no premium was ever expected from them. The reason assigned was, that the high-class education required, and the severe examinations which follow, deter them from entering the business, while the prospect of possessing a business themselves is remote and uncertain. It follows that assistants also are scarce. As an instance, I had in my hands one number of the *Pharmaceutische Zeitung*, in which there were ten advertisements for apprentices, six for situations, and 124 for assistants. For these the prospect of business is remote and uncertain; they may have passed their Major examination, and shown themselves fitted for conducting a pharmacy, yet assistants they must remain until a vacancy occurs by death or retirement, and even then the purchase-money required is so large that comparatively few can ever hope to possess it.

Having qualified, what inducement is there for continuous study? None, but an inherent love of the science. Once established in business, competition is not feared; and that most natural incentive to progress is entirely wanting. Again as regards the "Arznei-taxe," if the taxed list of prices be quite proper for the wealthy, it must press very hard upon the mechanic. In England it is usual to study the means of the working classes, but in Germany medicines are regulated by one code of prices.

There seems to me a general lack of interest in pharmacy in towns like Hanover and Brunswick, and also in Dresden; there is a want of union among the principals, and there are no societies where apprentices and assistants have opportunities of study. In Great Britain there is a cry from different parts of the country, reaching the parent Society in Bloomsbury Square, asking for assistance in money, books, diagrams and apparatus. It may be difficult to satisfy those wants, but they indicate vitality and a healthy feeling. I have heard nothing of the kind in North Germany.

The data which I have here brought before you have been obtained with much care and labour, usually from two or more independent sources in every town or city; I believe them to be facts and not coloured. For the inferences I am alone responsible. I know, at the same time, that on this subject opinions in Germany are much divided; those who are now in business believe in the present condition of things, those who are not, and "their name is legion," think otherwise.

I take this opportunity of stating the pleasure it afforded me to hear how highly the Pharmaceutical Society of Great Britain is appreciated by the pharmacists of North Germany; but I cannot avoid the conclusion that pharmacy there is now suffering from over-legislation, that the limitation of establishments and Government protection is not conducive to its best interests, and that it has at the present time, looming before it, the most serious questions—questions which press for solution, and must one day be grappled with and solved; and I believe that it is not at the present time in a satisfactory and progressive condition.

Leaving Dresden, and with it Northern Germany on my way to Austria, I shouldered my knapsack, and crossing the Elbe, spent a few days in Saxon Switzerland, where, amidst the moss-grown and lichened rocks of that romantic spot, I forgot, for the time, that there existed such a science as pharmacy.*

DIGITALIS.†

BY J. MILNER FOTHERGILL, M.D.

(*Concluded from page 324.*)

Action on Frogs.—These have purposely been put last, on account of the large number of experiments to which they have been subjected by various writers. Frogs have been made much use of by experimenters, on account of their great susceptibility to medicines, and the ease with which experiments could be carried on. Dybkowsky and Pellikan abroad, and Hilton Fagge and Stevenson in England, experimented largely on them, with uniform results as regards the state of contraction of the heart observed. Dr. Fothergill found that when digitalis was administered by the mouth, or hypodermically, its effects were quickly apparent. First, the contractions became somewhat quicker, and the contraction more complete. Soon the peristaltic action became more marked, the systole being longer and more perfect. Then the distension became less complete, especially at the apex, which remained white and firmly contracted. The action of the ventricle became almost vermicular in its slowness, and the diastole was most imperfect, till the ventricle came ultimately to a standstill in firm contraction, the heart being much diminished in size,—and in size, shape and colour, much resembled an unripe apple-pip. The frogs did not seem much affected otherwise, the poison seeming to be confined, as regarded its action, purely to the heart. If released, they hopped about unconcernedly, nor did the removal of the contracted heart by scissors cause them any apparent inconvenience. They merely seemed to die ultimately from the arrested respiratory changes: a slow mode of death in cold-blooded animals. The results were uniform as regards the contracted condition of the ventricle. To other frogs were administered belladonna, caffein, strychnin and aconite. The first produced rather marked contraction; caffein somewhat less so. Strychnin produced no perceptible effect, contrary to anticipation. Aconite produced paralysis and arrest of the heart in diastole. A still more interesting series of experiments was performed. To some frogs, digitalis and aconite were administered, side by side, and the opposite actions contrasted. The experiment was then varied; and, after the action of each drug was well established, the other was administered—*i. e.*, after the effects of digitalis were well established, aconite was administered; and to others, after the action of aconite was well brought out, digitalis was given. Over the action of digitalis, aconite certainly had an influence, but it could scarcely be called a marked one, and did not ultimately arrest the contraction produced, even when pushed. On the contrary, the administration of digitalis was followed by the most marked

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* The author purposes dealing with the subject of Pharmacy in Austria in a future paper.

† Abstracted from the Hastings Prize Essay, for 1870, published in the *British Medical Journal*, Nos. 548 to 553.

results, when aconite had been given, and the ventricle had become gradually more and more distended, and its contractions more and more imperfect,—each contraction merely expelling a small quantity of blood off the top of the distended ventricle, the contractions becoming slower and slower, and less and less perfect, until a condition of advanced dilatation had been artificially produced; and even when the heart seemed to have given up all action, and remained in diastole, distended with blood and inert. When all action had apparently ceased, the first effect was to produce an imperfect contraction at long intervals; then the intervals became shorter and the contractions more complete, some irregularity both as to time and amount of contraction being observed. Slowly and gradually, however, the distended ventricle recovered itself under the action of digitalis, the contractions being more rhythmical and perfect, and the distension less and less pronounced, until a return to normal contraction and distension was brought about. If the administration of digitalis were then continued, the same appearances were brought out as when no aconite had been previously given. This interesting experiment was frequently performed before other medical observers, and can be readily repeated. In all the experiments the ventricle was the most affected; in the frog, where there is only one ventricle, the auricle could only remain distended behind it, incapable of getting rid of its contents into the firmly contracted ventricle in front, and of course it could not contract unless its contents could be disposed of: if the venous sinuses behind were pricked, as in the case of the minnows, the auricles soon became contracted. As regards the effects upon the rhythm, the general results may be stated broadly thus: at first there were occasional slow beats, interposed without any exact order; and then, as the effect became more marked, the slow beats preponderated, until the contractions were only occasional before complete cessation in systole. During an experiment on a dog by Brunton and Gamgee, a temporary murmur was observed, which they concluded was due, and apparently with good reason, to an irregular action of the musculi papillares, producing imperfect closure of the mitral valve.

In these experiments on the frog, sometimes the tincture of digitalis was used, and at other times the infusion. In some instances, a solution of digitalin was used, but its effect in producing increased contraction was certainly not so marked as when a preparation was used which contained the other principles. It is not intended that this statement should convey the impression that there exists any good reason for supposing that digitalin is not the active principle in digitalis; but such is the writer's experience.

Hilton Fagge and Stevenson found that, sometimes, the ventricle makes only one pulsation for two of the auricle, the number of its contractions being therefore lessened one-half (Transactions of the Royal Society, May 1865, Conclusion 3). Reid seems to think that sometimes more than one auricular systole is necessary to produce such ventricular distension as would excite contraction. This seems in accordance with reason and fact.

Antidotes.—In cases of poisoning where it is known that the symptoms arise from the use of digitalis, and not from attacks of cardiac syncope, the use of agents must be resorted to which are known to paralyse the heart,—for instance, aconite. Although in the experiment on the frog, the action of aconite on the heart after the poisonous effects of digitalis had been induced was far from being so marked as when digitalis was given in aconite-poisoning, aconite might prove of service as an antidote to digitalis. From the action of the Calabar bean, as described by Dr. T. R. Fraser, of Edinburgh, it is highly probable that it would act beneficially in the excessive action of digitalis. This leads the author to consider the question of agents of similar action.

Drugs of similar Power.—The whole question of agents acting upon the heart so as to increase its power of contraction is comparatively new. With the exception of digitalis we are, generally speaking, scarcely acquainted with their names. The agents are either entirely new, or nothing has hitherto been known of their secondary effect upon the heart. The list of them is a short one, and will not take up much space in the enumeration. Thus Dr. Clifford Allbutt has advocated the use of Virginian cherry-juice (*Prunus Virginiana*) in cardiac affections; Dr. John Harley has investigated the action of belladonna; Dr. Braidwood the action of dajasck, or arrow-poison of Borneo (*Tanghanina venenifera*); Drs. Hilton Fagge and Stevenson have investigated the action of the *Scilla maritima* and the *Helleborus viridis;* and Leven has investigated caffein and thein. Of these, the writer has only experimented on digitalis, belladonna, and caffein. There is thus plenty of opportunity for investigating further the action of these drugs, and adding to what we already know of their action; while there is a ground for hope that to this list may be added new agents more certain, more effective, and more manageable than those we as yet possess. Dr. Fothergill considers that by thus treating digitalis as a member of a class of agents, it will much facilitate the investigation into the usefulness, or uselessness, of a drug as a cardiac neurotic. It is obvious that other agents which increase the ventricular contraction and bring the heart to a standstill in systole, must necessarily possess a therapeutic value allied to that of digitalis. In prosecuting such an inquiry, it will be easy to ascertain to what extent the action is common to that of the whole class, or in what it is singular. This grouping of agents as to action will assist us in aggregating a number of agents with either a primary or secondary effect upon the heart; in time this will constitute a group, and in practice the remote effect of an agent upon the heart will be taken into consideration in the choice of therapeutic agents. It is only by the grouping of agents and then testing them by clinical experience and physiological experiment, observing the successes, the failures, and their causes, that we can expect to emerge from our present therapeutical chaos. Thus, under our old plan of empirical testing of agents, colchicum has six or eight times been removed in and out again of our Pharmacopœia. The same, to a less extent, has occurred to numerous other agents of no trifling activity. It is obvious that the use of these agents has been conducted on nothing approaching a law, else some definite conclusions one way or the other must have been arrived at. Without some definite idea of what it is we want exactly to attain, and by what action our agent is likely to achieve the desired result, we cannot be said to do anything more than—to use a vulgarism—"make shots." The experiments of Crum Brown and Frazer into the physiological and chemical agency of drugs, and Broadbent's valuable speculations on chemical tension, and the question of the retardation or aiding of oxidation as a mode of explaining the action of many agents, are steps in the right direction, the value of which we are scarcely yet in a position to correctly estimate.

The Use of Digitalis.—Like other vegetable substances, digitalis is prepared for use by either tincture, infusion, extract, or separation of the active principle digitalin. The extract is little used. The tincture is the most convenient form ordinarily, but throws down a dark green precipitate with iron, which detracts from its desirability. For general use, it can be given along with the ammonio-citrate of iron, or, still better, the potassio-tartrate. It is better kept in a dark cupboard or wrapped in a dark coloured paper, as light is supposed to act deleteriously upon it, weakening it and lowering its activity. The infusion is a good preparation for use along with potash or diuretics, and is conveniently added to vegetable infusions. Digitalin in solution may be the most elegant form, and perhaps may be found ultimately to be the most exact form for accurate administration; but in some experiments on frogs, a solution of digitalin did not produce such a decided effect as the tincture upon the ventricular contractions. It is possible that the other constituents, digitalose, digitalic acid, etc. may possess properties peculiar to themselves; and when the importance of a knowledge of the action of different agents on the heart-walls becomes fully recognized—for as yet we are only on the threshold of the inquiry—a careful investigation of them may not be barren in results. In the treatment of chronic conditions, when it is necessary to keep up the administration of digitalis until structural changes are produced, Dr. Fothergill considers that perhaps the powdered leaves are the most desirable form. In this form, digitalis can be given in pills with the dried sulphate of iron, carminatives, laxatives, or both, and in this form will keep some time, and can be given twice a day without causing the patients to revolt at its nauseous taste, or creating any aversion, on æsthetic principles, to its muddy-looking combination with iron. For long, a favourite form of pill with him for persistent use has been a combination of half a grain to a grain of powdered digitalis, with an equal quantity of the dried sulphate of iron in powder, and a morsel of cayenne, in extract of gentian, or aloes and myrrh pill, thus securing an action on the circulation, the addition of iron in a form which will act locally on the stomach, and thus act as an astringent in the gastric catarrh so common among sufferers from heart-disease; while the carminative action of the cayenne is useful, and also takes off the griping from the action of the laxative, when an action is also necessary, as is commonly the case, on the bowels.

In cases where there is a risk of digitalis disordering the stomach, it may be administered by absorption through the skin by means of poultices of the leaves or flannels soaked in the infusion, or a mixture of the tincture and water applied to the abdomen and thighs. Hypodermic injection is another mode of administering it, and Bouillaud pursued an endermic treatment by dusting a blister over the heart with from six to fifteen grains of powdered digitalis.

NICKEL PLATING AS APPLIED TO PHOTOGRAPHIC PURPOSES.

BY JOHN SPILLER, F.C.S.

About ten years ago, when visiting the bank-note printing establishment of Messrs. Bradbury and Wilkinson, of Fetter Lane, I was shown some nickel-coated plates from which the "nature printing" specimens had been prepared, and had an opportunity of seeing the electro-deposition of pure nickel upon copper and other metals practically carried out as one of the branches of their printing operations. This process was being applied conjointly with, or as a substitute for, the method of steel facing (*aciérage*) of which they are the patentees, and it struck me at once that the permanent quality of the nickel deposit so formed was capable of wider application, and might serve as a means of protecting steel objects from the rusting influence of damp air.

At my suggestion a few steel articles—particularly a dinner-knife, spatula, and split-ring—were coated with nickel, in order to test the degree of protection which such a process would offer when applied to swords, bayonets, helmets, breast-plates, spurs, harness chains, and steel accoutrements generally. The experiment proved perfectly successful, and without prejudice to the colour, and steps were then taken with the view of submitting the idea to the notice of the War Office authorities, particularly as the cost of applying such a process did not appear likely to stand in the way of its general adoption when the great saving of time in cleaning these articles was duly taken into account.

Beyond establishing the fact, no immediate result followed, and from that time to the present year the application of electro-deposited nickel has, so far as I am aware, been restricted to the specific purposes for which Messrs. Bradbury and Wilkinson have continued to apply it in their establishment. Within the last two or three years fresh attempts in my original direction have led to the employment of this process in America, where a patent was taken out for the application, and a company now working under a licence of the American patentees has recently commenced operations in London and Birmingham. I am indebted to the energetic manager of the Plating Company (Limited), Mr. Channer, of 34, Kirby Street, Hatton Garden, for the opportunity of inspecting a vast collection of objects to which the nickel-coating has been applied, and have been furnished likewise with small specimens of copper, brass, and steel coated with the metal in question, by which I am enabled to substantiate the statements made in their prospectus relative to the wonderful degree of protection afforded to the underlying metals by the superficial deposit of pure nickel. I have since had my regulation sword coated at their works, and find it now perfectly secured against rusting in wet weather, and so easily kept in condition that the blade and scabbard require only to be wiped with a washleather, instead of undergoing the tedious process of burnishing, to fit it for appearance on parade.

A small square bar of steel similarly coated has been repeatedly immersed in water for hours together without showing any signs of rusting, and I find it possible to bury it in flowers of sulphur for several days without tarnishing the lustre of the nickel surface. Neither has this latter severe test any effect upon the copper and brass bars upon which the nickel coating has been applied, and these metals may even be immersed in an aqueous solution of nitrate of silver without effecting the reduction of that metal. In one of the angles only, where the coating seems to be imperfect, was there any indication of silver reduction in the case of the brass tube, the steel bar being perfectly protected over the whole surface against the action of silver and copper solutions. Here, then, is a valuable property which I was not led to anticipate in the case of electro-deposited nickel, for I could not have predicted from my chemical knowledge that a metal of the zinc and iron group would be proof against the action of nitrate of silver; but the experiment proves it to be so, and we must regard pure nickel as belonging (from this point of view) to the class of noble metals, resisting, like gold and platinum, the attack of sulphur and of highly corrosive metallic solutions.

The nickel facing, when burnished, has a whiter colour than polished steel, although not equal to silver itself, its aspect being rather that of rolled platinum. A chemist to whom I showed the specimens pronounced them at once to be very similar to platinum in regard to colour, thus confirming my own impression on this head. It withstands the action of heat also remarkably well, for the fusion-point is very high, and oxidation occurs only at elevated temperatures. With the view of testing its general applicability to laboratory work, I am having a brass scale-pan coated with nickel, and will report later as to its success. For fine balance beams and weights, lens mountings, reflectors, laboratory microscopes, Sykes's hydrometers, still-worms, egg-beaters, camera fittings and a variety of apparatus used by the chemist and photographer, the nickel coating will probably find extensive application; and I have seen some oval picture-frames of very pretty effect made from stamped brass coated with nickel. It remains to be mentioned that burnished and matt surfaces of this metal may be used in combination for ornamental purposes.—*Photographic News.*

The Pharmaceutical Journal.

SATURDAY, NOVEMBER 4, 1871.

Communications for this Journal, and books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

AMERICAN COURTESIES TO ENGLISH PHARMACISTS.

As will be seen from the report on another page, the proceedings of the Evening Meeting on Wednesday last were considerably increased in interest by the presence of Mr. H. B. BRADY, who had just returned from a visit to America, where he had been present, in a semi-official character, as President-Elect of the British Pharmaceutical Conference, at the meeting of the American Pharmaceutical Association at St. Louis. Invited by the CHAIRMAN to furnish some particulars of his journey, Mr. BRADY complied by giving a short account, which cannot but be a source of gratification amongst all those who have the welfare of pharmacy at heart, although it is to be hoped that it will be supplemented by the half-promised fuller narrative when, to use his own words, "the events of the last two or three months have come to something like a reasonable focus in his brain." The influence of such kindness as that displayed by our American brethren towards Mr. BRADY, being, as it was, only a repetition of the goodwill experienced by Mr. HOWDEN, must be productive of great good in a national as well as in an individual sense; and pharmaceutists, surprised out of themselves to find that it only requires an ocean rolling between their places of business to enable them to discern so many good points in their brethren, will be better prepared to give and to receive acts of kindness from those with whom they have to enter into close competition in business.

Though Mr. BRADY's reception in the States was, to a great extent, the natural result of a high-class scientific reputation which superseded all need for introduction, we are sure that the hospitality displayed towards him by pharmaceutists will be esteemed by their English brethren as a compliment paid to the whole body in the person of a representative man, and should an opportunity occur, the kindness would, doubtless, be heartily reciprocated by them.

At the recent meeting at St. Louis it was determined that invitations should be issued to the pharmacists of all nations to meet the Association at Philadelphia in 1876, and we hope on that occasion England will be well represented, though it is in the power of few to leave their business for so long a time as such a visit would require. But to those who must needs be content with a few days' relaxation we would venture to say that an equal amount of gratification and profit is to be obtained at the meetings of their own countrymen in connection with the Society of which Mr. BRADY is so worthy a President.

On the occasion of a former meeting of the American Pharmaceutical Association we remember the question "Who is SAUNDERS?" having been asked with an evident feeling of cockney bewilderment, in reference to the statement that this gentleman had taken a very active part in the proceedings, and we are glad to find that Mr. BRADY's account of his pharmaceutical colleagues at St. Louis affords material for dispelling a mystery that we were informed neither the Pharmaceutical Register nor the Directory could solve.

THE CONSUMPTION OF CHLORAL HYDRATE.

WHAT becomes of all the chloral? a question recently asked by our contemporary the *Lancet*, and founded upon a statement made in a private letter, received by Dr. GEORGE HARLEY from Baron LIEBIG, has elicited several attempts to answer it. Baron LIEBIG had been told, by a chemical manufacturer, that he made half a ton of chloral hydrate weekly, and that the drug is used in such enormous quantities in Germany and England as to prohibit the belief that its employment is limited to the sphere of medicine alone, some persons affirming that it finds its way into beer.

The problem of the philosopher and the manufacturer in Germany has met with easy solution by certain journalists in England, and doubtless they think the matter is closed up. But there is a difficulty in congratulating them, inasmuch as they do not agree. The *Spectator*, advancing a few steps in the road wherein another weekly journal has found a certain kind of notoriety, pooh-poohs the beer theory. It says that taking chloral is the new and popular vice, particularly among women, and informs us that the drug is kept in thousands of dressing-cases, while those who begin its use often grow so addicted to it that they pass their lives in a sort of contented satisfaction.

Here the *Echo* steps in with the pertinent remark that what with alcohol, sherry, lavender drops, laudanum, pick-me-ups and now chloral, a lady's dressing-case must be something between a medicine chest and a dust-bin; while "A Druggist's Shopboy"—who, by the bye, with a shopboy's propensity to exaggeration when talking of his employers, increases the number of manufacturers producing half a ton weekly to twelve—furnishes a curious calculation that sixty grain-doses would be thus provided daily for 204,000 habitual chloral drunkards. But the *Echo* is equally dogmatic, and after a learned disquisition, in which we are informed that there is every reason to believe that chloral, like digitalis, is a "cumulative" drug, and that a course of small doses has as fatal an effect as one big dose, it decides that beer drinkers are the great consumers of chloral hydrate. It is explained that the property possessed by cocculus indicus, of inducing great thirst and making the victim lazy, and disposing him to linger where he may at the time be seated, is shared by chloral hydrate, whilst the latter has the extra recommendation of costing less. Should this explanation be true, there will be matter for the serious consideration of all beer drinkers—especially in view of the cumulative properties—and we may expect a repetition of the combined purgation and puff which was thrust upon the public when, a few years since, the consumption of strychnia and bitter ale was stated to be in relative proportions. But what ought to become of those persons who continually take large doses, such, for instance, as the gentleman who recently recorded in the *Lancet* that he had taken thirty-five grains nightly for eighteen months?

There are others, however, who have taken notice of the enormous development of chloral hydrate manufacture. In the Customs and Inland Revenue Act, passed at the end of the last session, there is a clause providing that upon the importation into Great Britain and Ireland of any article in the manufacture of which spirit shall be used, there shall be charged upon such article, in respect of the spirit so used, a duty equivalent to that which is chargeable upon the like quantity of spirit on its importation. This, in the case of chloral hydrate, amounts, we believe, to 1*s*. 3*d*. per lb. We doubt not that the Lords of Her Majesty's Treasury will participate in the "contented satisfaction" associated by the *Spectator* with the consumption of this drug.

We have already called attention to the possible risk attending the amateur administration of this useful remedy by publishing the remarks made by Dr. Richardson on the subject. Since that time we have had to record several cases of death resulting from its improper use. We take this opportunity of republishing from the *Lancet* the following letter from Dr. Andrew Dunlop, of Jersey:—

"As a belief in the perfect harmlessness of chloral seems to be still wide-spread, perhaps you will allow me to add my word of warning to those already given, and to call attention to some alarming symptoms I have seen produced by it. On four or five occasions, after giving twenty or thirty grains of chloral, I have found that the patient slept for about a quarter of an hour, and then awoke in a state of deadly faintness; the lips livid, the face pale, and the pulse almost imperceptible. There was a sense of intense exhaustion and impending death, mingled with an indescribable delirious feeling; this lasted for about five or ten minutes. Curiously enough, one patient, as he was rallying from this state said, 'Don't give me any more of that chloroform.' He had taken chloroform a day or two before, and the sensations produced by the chloral so closely resembled his feelings on that occasion, that he thought I had given him chloroform again. Another of these patients, in addition to the other symptoms, saw figures dancing wildly round the foot of her bed. This patient had mitral disease, and was the only one of the four or five who had heart affection. As has already been indicated in the *Lancet*, by Drs. Fuller and Crichton Browne, chloral has a depressing action on the heart, and should therefore be avoided in all cases where the activity of that organ is impaired.

"While it occasionally produces ill-effects, chloral also frequently disappoints us, especially when it is given to relieve pain, or when the patient has been accustomed to opium—by acting very inefficiently, or by producing no effects at all.

"For my own part, I have found it most serviceable in cases of simple insomnia, and in the sleeplessness of phthisis and some nervous disorders."

The Editor of the *American Journal of Pharmacy*, in reprinting Mr. Hanbury's interesting historical notes on galangal,* remarks that the root is little known in American pharmacy, and perhaps never employed in the regular practice of American physicians. But it is frequently sold in various parts of the country by pedlars and travelling "medicine men" as a cure-all, or as a cure for dyspepsia, diarrhœa, headache, or toothache. During the last few years samples have been repeatedly received from localities where it had been sold under the names of China, India and East India root. Under the latter name it was recently sold in the streets of Philadelphia at about twenty-five cents per ounce,—a moderate charge as compared with that exacted in some western districts, where fifty cents per ounce, or eight dollars per pound, has been the price paid for it.

The lectureship in Materia Medica and Therapeutics at Middlesex Hospital is now vacant.

An effort is being made at Bow to limit as far as practicable the hours of labour in the pharmaceutical establishments in that locality. A circular has been issued by Messrs. Barnes, Butcher, Dean and Garman, stating their intention, after Monday next, to close at nine o'clock every evening except Saturday, when the hour will be eleven, and requesting their customers to supply their wants before those times. We hope that these gentlemen will meet with the co-operation, not only of their customers, but also of their brother pharmaceutists.

Professor Huxley will deliver the second Lecture of the course on Elementary Physiology on Monday next, at 4 p.m., at the London Institution.

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* See *ante*, p. 248.

Transactions of the Pharmaceutical Society.

MEETING OF COUNCIL.

November 1st, 1871.

MR. A. F. HASELDEN, F.L.S., PRESIDENT, IN THE CHAIR.

MR. EDWARDS, VICE-PRESIDENT.

Present—Messrs. Atherton, Betty, Bottle, Carr, Frazer, Greenish, Hills, Mackay, Sandford, Savage, Shaw, Smith, Stoddart, Sutton, Williams and Woolley.

The minutes of the last meeting were read and confirmed.

The Report of the Finance Committee was presented, showing on the General Fund Account a balance in the Treasurer's hands of . . . . £1098. 10*s.* 4*d.*
And submitting for payment sundry accounts, amounting to . . . . . . £613. 19*s.* 5*d.*
On the Benevolent Fund Account a balance of . . . . £202. 1*s.* 11*d.*

Resolved—That the Report of the Finance Committee be received and adopted and payments made.

The Report of the House Committee was presented, received and adopted.

The Reports of the Library, Museum and Laboratory Committees of the 13th and 19th October, recommending additional cases for the museum and stoves for warming the laboratory were presented, received and adopted; and the Committee was instructed to carry out the work.

Moved by Mr. Smith, seconded by Mr. Bottle,—

Resolved—That the attention of the Library, Museum and Laboratory Committee be directed to the recovery or replacement of the books missing from the Library, and that a complete catalogue of the books in the Library being desirable and necessary, the Committee be requested to ascertain the cost of printing it, and report to the next meeting of Council.

Report of the Special Committee appointed on the 6th September to consider and report on Mr. Deane's letter in reference to the condition of the Museum, Library and Specimens for the use of the Board of Examiners in Scotland.

"It is the opinion of this Committee that it is the duty of the Pharmaceutical Society of Great Britain to provide better rooms in Edinburgh for carrying on in a satisfactory way the examinations, and for the general use of the Society in Scotland; also to augment the Library and Museum there. The Committee further think that a paid officer should be appointed to perform Secretarial and other duties for the Society, under the direction of the Honorary Secretary."

Moved by Mr. Carr, seconded by Mr. Greenish, and

Resolved—That the Report of the Committee be received.

Mr. BOTTLE asked that Mr. Deane's letter should be read, and the Secretary read it accordingly:—

"*Clapham, 4th September*, 1871.

"*To the President and Council of the Pharmaceutical Society.*

"Gentlemen,—Having recently visited Edinburgh, and having availed myself of the opportunity for visiting and inspecting the rooms occupied and used by the North British Branch of the Pharmaceutical Society for conducting the examinations and for other purposes, I was much impressed with the inefficiency of the arrangements, as evinced more especially in the extent of our library and museum. For any really practical and useful purpose of study, and more especially for the proper conduct of the examinations as by law now required of the examiners in Edinburgh, they are quite inadequate.

"At the present time we occupy two rooms at No. 16, Princes Street, situated along a narrow lobby and up two flights of stairs, which are available for one day only in the week; thus precluding the majority of the members and associates from making proper use of either books or specimens. No collection, however extensive, could avail much under such conditions. Although the rooms can only be claimed by the Society one day in each week throughout the year, yet arrangements are in existence by which volumes are given out or taken in at any hour throughout the entire week; but this does not meet all the requirements of the case.

"The library consists of about 300 volumes only; and the museum of drugs, chemicals, etc., excellent and carefully kept as they are, comprises but 450 specimens; a number far below what a museum for study should be, belonging to such a Society as the Pharmaceutical Society of Great Britain, if it is desirable, as I presume it is, to sustain a high status amongst our brethren in the North, as well as amongst the medical profession in general.

"As to the collection of specimens used for the purposes of examinations, they are so defective and poor, that I can only characterize them as simply disreputable and totally unfit for the end to be attained. In stating this, I cast no reflection on our northern colleagues; they have evidently done the best with their very limited means. They most anxiously desire to be placed in a better condition, but they and I justly feel that it is not a mere local question for themselves to rectify, but one vitally affecting the interests and reputation of our body from one end of the country to the other.

"Under the existing conditions, uniformity in our examinations cannot exist, and a temptation is held out to our young men in the North of England to go where they might fancy they were least likely to be puzzled by a multiplicity of specimens.

"It should matter little whether young men went north or south of the Tweed for examination, and would not, if the conditions were the same, for one set of examiners is as well qualified as the other. It is therefore highly important that the Council of the Society should at once take active steps to remedy this defective state of our library, museum, and examining arrangements in Edinburgh.

"The suggestions I would make on the subject are as follows:—

"In the first place, suitable apartments should be taken, and properly fitted up. A flat of four rooms in some suitable locality where the library and museum should be available daily between certain hours seems desirable.

"That all duplicate books which can be spared from the London library, which the Edinburgh library does not already possess, should be forwarded as soon as the Council in Edinburgh is prepared to receive them; and that a sum not less than £ nor exceeding £ should be at once voted for the purchase of suitable books for the northern branch of our Library.

"That all duplicate specimens of drugs and chemicals which can be spared from the London museum, and which the Edinburgh museum does not already possess, should be forwarded as soon as the Council in Edinburgh is ready to receive them; and that a sum not less than £ be voted for the purchase of desirable specimens and suitable vessels for their reception.

"That a suitable selection of drugs and chemicals be at once selected and forwarded for the use of the examiners, who have a cabinet and drawers, merely requiring a few trays, ready to receive them.

"As an old examiner, and as an old member of Council, having taken a deep interest in the welfare of the Society from its foundation, I venture to place this subject before you, believing it to be one of the greatest importance, about which no time should be lost and no reasonable expense spared. It is not a question of money, nor of the numbers passing their examinations here or there; but it is one of necessity affecting our character for consistency and good sense, and of justice to those young men who have to appear before the Examiners, whether in London or in Edinburgh.

"I am, gentlemen,
"Yours faithfully,
"Henry Deane."

Moved by Mr. Hills, seconded by Mr. Shaw,—

That the recommendations of the Special Committee on Mr. Deane's letter on the North British Branch of the Pharmaceutical Society in Scotland be adopted.

Mr. Hills thought that as gentlemen and honourable men, they were bound to uphold the position so long held by the North British Branch, and hitherto so zealously and so successfully carried out in Edinburgh, and which has always been acknowledged by the Council in London.

Mr. Shaw seconded the resolution. He remembered the numerous meetings that took place in Edinburgh in connection with the matter, and he knew the difficulty Mr. Bell had in arranging the matter satisfactorily to all parties. Everything went on well; and, in 1854, it was stated, in the Annual Report of the Council to the Society, that the Board were working well in Scotland. He thought it was very desirable, seeing that the matter of the examiners was left to Scotland, that the members there should name the gentlemen whom they wished to act as examiners, and that they should every year have a communication made to them by circular, stating that a meeting would be held in Edinburgh for the purpose, and also the business to be transacted at that meeting.

Mr. Savage hoped they should elicit from Mr. Mackay whether any arrangement had been determined upon by the Local Committee, because it was very important that some arrangement should be made. They were at present paying for very inefficient accommodation a very large sum.

Mr. Woolley considered the resolution rather bare and bald. He quite agreed with the principle that the North British Branch should be conducted in a way that would reflect credit on the main Association, but the resolution committed them entirely into the hands of the North British Committee. He should like to know what sum was to be expended.

The President said no sum of money exceeding a certain amount could be expended without the sanction of the Council.

Mr. Mackay said it was now admitted that, as a part and parcel of the Pharmaceutical Society of Great Britain, the members in Scotland should be in a definite position. For a time they had very good rooms in Edinburgh, but those rooms had been required by the landlord for other purposes, and then the best was done that could be under the circumstances. They got two rooms in Princes Street, one on one floor and one on another, a state of matters causing very great inconvenience and discomfort in carrying on the examinations. With regard to Mr. Woolley's observation, he would say that not only they would not expend large sums of money, but they would only expend them under the supervision of the Council in London. It must also be remembered that although a sum of £50 was granted from time to time for the current year's expenses, those expenses had previously to the receipt of the money been partly incurred and paid. And he might further remark that in reference to the notion which had obtained as to large sums of money having been annually expended in carrying on the affairs of the North British Branch of the Society in Edinburgh, the fact was that the average annual expenditure from 1851 to the present time had only been about £62. They were, however, in the hands of the Council, and if it was said, "Go on as you have been going on," they were ready to do so.

Mr. Sandford was glad to find there was no occasion to say a word in support of the North British Branch. It seemed to be the wish of all that the affairs of the Society should be creditably conducted in Edinburgh, and at present there was not sufficient accommodation for the purpose. A complaint had been made by some gentlemen at the table that Mr. Hills' motion was not sufficiently definite, and he therefore suggested the addition of the following words:—"and that the President and Vice-President be requested to put themselves in communication with the Council of the North British Branch to ascertain what fresh arrangements are required, and at what cost they could be carried out."

Mr. Williams thought they ought to make definite laws for the management of the North British Branch.

Mr. Woolley rose to order.

The President ruled that Mr. Williams was not quite in order.

Mr. Williams desired to suggest that they should spend £20 in specimens to be sent down at once, and a committee should be appointed to draw up bye-laws and regulations for the North British Branch.

Mr. Betty thought the question was whether they should recognize the North British Branch as essentially an examining body, or whether they should consider that any educational office should be mixed up with it.

The President said the question before them was simply whether they would supply the examining Board in Scotland with proper materials and suitable premises to carry on the examinations.

Mr. Mackay said that from first to last they had never spent one single farthing of the Society's money in education, and that from 1851 to December, 1864, the Society had not paid the examiners. Courses of lectures had been from time to time delivered, but this had been done entirely at the expense of the students themselves.

The motion was then put, with the addition of the words suggested by Mr. Sandford, as follows, and carried unanimously.

That the recommendations of the Special Committee on Mr. Deane's letter on the North British Branch of the Pharmaceutical Society in Scotland be adopted, and that the President and Vice-President be requested to put themselves in communication with the Council of the North British Branch, to ascertain what fresh arrangements are required, and at what cost they could be carried out.

Moved by Mr. Stoddart, seconded by Mr. Sutton,—

That the Report of the Benevolent Fund Committee be received and adopted, and, on the suggestion of the President, that a pamphlet be prepared and published, setting forth the objects of the Fund with the names of the subscribers, donors, etc.

Moved by Mr. Savage, seconded by Mr. Edwards,—

Resolved—That John Watkins and Sarah Wilson be declared elected annuitants on the Benevolent Fund.

Resolved—That the Report and recommendations of the Parliamentary Committee be received and adopted.

Resolved—That the Registrar be authorized and is hereby instructed to remove from the Register the name of Charles Morrish.

On the Report of the Parliamentary Committee certain infringements of the provisions of the Pharmacy Act, 1868, were brought under the notice of the Council, and the Society's solicitor was instructed to take the necessary proceedings.

Resolved—That the Report and recommendations of the Provincial Education Committee be received and adopted.

A letter was read from the Honorary Secretary of the Leeds Chemists' Association, thanking the Council for their donation of £10 towards the library, and also for the monthly number of the PHARMACEUTICAL JOURNAL.

Resolved—That Alfred Franklin and John E. Griffith be appointed Local Secretaries to the Society at Fareham and Bangor respectively.

COLLECTOR FOR 1872.

Mr. Lancelot Steele Hughes was reappointed Collector for the ensuing year.

REPORTS OF THE BOARDS OF EXAMINERS.

October, 1871.

ENGLAND AND WALES.

Examination.	Candidates examined.	Candidates passed.	Candidates failed.
Major	7	5	2
Minor	36	17	19
Modified	34	23	11
Preliminary	222	140	82
	299	185	114

SCOTLAND.

Examination.	Candidates examined.	Candidates passed.	Candidates failed.
Major	1	1	0
Minor	11	7	4
Modified	4	3	1
Preliminary	19	18	1
	35	29	6

Resolved—That the following having been duly registered as Pharmaceutical Chemists, be respectively granted a diploma stamped with the seal of the Society:—

Browne, Joseph Alleyne...... London.
Gibson, Adam .... Dunfermline.
Gill, Joseph William .... Pendleton.
Maddock, William Thomas .. London.
Marks, Benjamin .... Plymouth.
Woolley, Harold .... Manchester.

Resolved—That the following registered Chemists and Druggists in business before the 31st July, 1868, be elected Members of the Society:—

Hudson, Robert Spear........ West Bromwich.
Pershouse, Edward .... West Bromwich.
Smith, Edgar Rayner .... Stafford.

Resolved—That the following having passed the Minor Examination, be elected Associates of the Society:—

Brown, Richard Fearon ...... London.
Caswell, Thomas George .... Dudley.
Gardner, James Richard...... Devonport.
Jameson, William Edward.... Bristol.
Marshall, Alfred .... Hornsey.
Redfern, John .... Oxford.
Tamplin, Charles Edward .. Kingston-on-Thames.
Williamson, Joseph Burrell .. Edinburgh.

EXAMINATION IN LONDON.

October 27th, 1871.

Present—Messrs. Allchin, Barnes, Bird, Carteighe, Cracknell, Davenport, Edwards, Gale, Garle, Haselden and Ince.

MODIFIED EXAMINATION.

Thirty-four candidates were examined; *eleven* failed, the following *twenty-three* passed, and were declared duly qualified to be registered as

CHEMISTS AND DRUGGISTS.

Ashton, Alfred .... Kennington.
Bailey, Edward Smith........ Brighton.
Carman, John .... Chester.
Cavell, John .... Long Sutton.
Dubois, Bernhard William.... Brixton.
Griffits, John Alonza .... Wantage.
Harrison, Thomas Evison .... Lincoln.
Hickman, Frederick .... Southampton.
Howe, Joseph Mason .... Dublin.
Huxtable, James .... London.
Owen, William.............. Pwllheli.
Parkin, Thomas .... Hereford.
Sansom, Henry.............. Hitchin.
Smith, James Malcolm ...... Doncaster.
Stevenson, Richard Walter.... Derby.
Taylor, Alfred .... Kendal.
Tijou, Tom .... Kettering.
Vickers, Thomas .... Beverley.
Waller, Robert .... Doncaster.
Womack, Thomas............ Barnsley.
Woolrich, Francis............ Uttoxeter.
Wright, Arthur .... Nottingham.
Wrighton, Thomas H. Garland. Birmingham.

PRELIMINARY EXAMINATION.

Certificates were received from the undermentioned in lieu of this examination:—

Miller, Ernest John.......... Melbourne, Royston.
Plowman, Sydney .... Boston.

EXAMINATIONS IN EDINBURGH.

October 17th, 1871.

Present—Messrs. Aitken, Buchanan, Gilmour, Kemp, Noble and Young.

MAJOR EXAMINATION.

The following gentleman was examined, and was declared duly qualified to be registered as a

PHARMACEUTICAL CHEMIST.

*Gibson, Adam .... Dunfermline.

MINOR EXAMINATION.

Eleven candidates were examined; *four* failed, the following *seven* passed, and were declared duly qualified to be registered as

CHEMISTS AND DRUGGISTS.

*Green, Thomas.............. Belfast.
*Mellor, Thomas .... Bury.
Anderson, Alexander .... Elgin.
Williamson, Joseph Burrell .. Edinburgh.
Hinksman, John .... Edinburgh.
Edward, William Wales...... Aberdeen.
Linklater, James .... Edinburgh.

The above names are arranged in order of merit.

PRELIMINARY EXAMINATION.

Nineteen candidates were examined; *one* failed, the following *eighteen* passed, and were declared duly qualified to be registered as

APPRENTICES OR STUDENTS.

Mathie, William .... Edinburgh.
King, George .... Elgin.
Thomson, Robert .... Stirling.
Grant, R. J. .... Elgin.
Daniel, James .... Stonehaven.

* Passed with honours.

Equal.	Gilmour, James	Edinburgh.
	Reid, James	Edinburgh.
	Davidson, James	Falkirk.
	Blanshard, Richard Lacy	Edinburgh.
	Gray, James	Edinburgh.
	Tweedie, Alexander	Edinburgh.
	Macintosh, John	Elgin.
	Ellis, Thomas Russell	Dunfermline.
Equal.	Gibson, Aikman Graham	Edinburgh.
	Ogilvie, John Hovel	Montrose.
Equal.	Dick, Robert G.	Edinburgh.
	MacGregor, Donald	Edinburgh.
	Stuart, Thomas Peter Anderson	Dumfries.

The above names are arranged in order of merit.

MODIFIED EXAMINATION.

Four candidates were examined; *one* failed, the following *three* passed, and were declared duly qualified to be registered as

CHEMISTS AND DRUGGISTS.

Dickinson, Joshua Steel	Newcastle-on-Tyne.
Sinclair, George Fisher	Liverpool.
Wright, John Armstrong	Macclesfield.

PHARMACEUTICAL MEETING.

Wednesday, November 1st, 1871.

MR. A. F. HASELDEN, F.L.S., PRESIDENT, IN THE CHAIR.

The following Donations to the Library were announced:—

Calendar of the Royal College of Surgeons, of England, 1871,—University College, London, Calendar, Session 1871–72,—Transactions of the Clinical Society of London, Vol. IV.,—Statistical Tables of the Patients under Treatment in the Wards of St. Bartholomew's Hospital during 1870,—La Viande des Animaux malades au point de vue de l'Alimentation publique, par M. T. Hetet: from the "Société d'Acclimatation."

The thanks of the Meeting having been accorded to the several Donors, the PRESIDENT then called upon Mr. J. B. Barnes to read a paper on "A New Excipient for Pills," which will be found printed at p. 361.

At the conclusion of the paper,

The PRESIDENT said that this was a very appropriate pharmaceutical subject, and one upon which he imagined they must all have some notion, if not much experience. He very much disliked ever having to find fault from that chair, but he had told his friend Mr. Barnes that he demurred to the practice of putting these medicines into pills. Pills might be very convenient at times, but as a general rule he thought they should endeavour, if possible, to put these remedies in some other shape, especially the hydrate of chloral. He considered it very objectionable to put hydrate of chloral into pills, which might be swallowed almost *ad libitum*, and they scarcely knew what the consequences might be. With respect to sulphur, he thought there could be no great objection to the pill system. Having looked into the specimens of pills before them, he certainly must say that they were very ingeniously and cleverly put together; and if at any time pills of that kind should be required, there could not possibly be anything better than those which Mr. Barnes had placed upon the table. They should at all times give encouragement to gentlemen who brought forward these modified, or what they conceived to be improved, conditions for making medicines, although, as one of the old school, he objected to pills when he could give the medicine in the shape of draughts. He should be very glad to hear expressions of opinions from gentlemen in the room who had had more experience in this matter than he professed to have.

Professor ATTFIELD would like to ask Mr. Barnes, by way of introducing the discussion, whether he had made any experiments as to the relative rate of solubility of these pills. He remembered that some time ago Mr. Morson brought before their notice some so-called soluble cream of tartar which had solidified, and which subsequently, he thought, was found to be not so readily miscible with water as the ordinary more fluid preparation. It was possible that the tartar in these pills might be in a similar condition. At all events it was important to know at what rate pills dissolved.

Mr. BARNES replied that he found the pills dissolved in a very short time when placed in tepid water, perhaps, on the average, in about ten minutes.

Mr. LINFORD thought this question rather brought up the idea whether the reason for putting these medicines into pills was that their action might be more gentle or more modified on the system. He did not know whether members had experimented on the difference to be obtained with such substances as scammony resin, or jalap, in this direction. Their duty was to prepare medicines ordered by medical men, but in that preparation they ought to look somewhat to the subsequent action upon the system, and it was a question whether the real end and purpose of putting these things into pills was not that, by their being gradually dissolved, their action might be correspondingly modified.

Mr. J. E. HOWARD, F.L.S., then read a paper on "Cinchona-trees grown in India," which will be found printed at p. 361.

The PRESIDENT said that this was a very important communication, and one in which they all, no doubt, took great interest. It was possible that some of the gentlemen present might be able to offer some further remarks upon the subject. There was only one point that struck him as being a mercantile question of some importance, and that was why the Government should have encouraged the growth of the *succirubra* barks in preference to the *Calisaya* barks, seeing that the latter produced a larger amount of quinine—so much used in this country—than the other. He had been told by a commercial gentleman who dealt largely in these articles that it appeared to be a mistake on the part of the Government that they had undertaken to grow, and had grown, the *succirubra* barks instead of the *Calisaya* barks. He personally was quite inexperienced in the growing of these barks, but still it struck him as a curious fact that the Government should have grown the Succirubras, which were seldom used nowadays. Occasionally, it was true, a physician ordered *succirubra* bark in an infusion or a decoction, but the general thing was *Calisaya* bark, both for quinine and in nearly all the preparations they used in pharmacy. Perhaps some gentleman could enlighten them upon the subject. Professor Bentley was present, and probably he would kindly say something on the point to which he had referred.

Professor BENTLEY said that, having been called upon, he would express the pleasure he felt in hearing the paper with which they had been favoured, for they always looked to Mr. Howard for any information upon the subject of barks, which he had certainly made peculiarly his own, not only in this country, but in all parts of the world. He (Professor Bentley) should not have risen on this occasion if he had not been appealed to by the President. If he understood properly, Mr. Howard spoke particularly of the great development in the cultivation of the *Cinchona succirubra* in comparison with *Cinchona officinalis*, and he also thought Mr. Howard had said that there was a larger development of the bark of the *officinalis* than of the *succirubra;* but he did not understand that

Mr. Howard wished to draw any practical result from that, or imply that there was any particular reason for growing *succirubra* in preference to *officinalis*. He should like to know whether the results obtained were founded upon a simple examination of one or two plants, or whether they were arrived at by the examination of a number of plants, because every one who knew anything about the development of plants would agree with him, that two plants selected promiscuously would not yield any special result which could in any way be depended upon. There was another question in which he felt particularly interested. Some years ago Mr. Howard favoured them with an examination of the root-bark of certain plants of *Cinchona calisaya*, and there was great difference of opinion in regard to the matter; Mr. Howard showing that the root-bark was very much inferior in every respect to the stem-bark. But this result was afterwards called in question, or rather, certain other investigators came to a different conclusion. If he rightly understood Mr. Howard's paper that evening, it was to this effect, that no special examination was made of the root-bark, because it was too thin. If, however, he had made any such examination, it would be very interesting to know the comparative value of the root-bark and the stem-bark, not only as bearing upon the particular views which Mr. Howard had always held, but as bearing on those different alkaloids or different parts of the bark which were of great importance to those who took an interest in physiological botany.

Mr. Howard remarked that, in reference to the different species of Cinchona, he had always urged upon the Government the securing, in the first place, of all the species they could get from South America, and giving them all a fair trial under different circumstances. One species would develop much more rapidly in bog earth perhaps, while another would develope in loam. *Succirubra* would develope well in loam. Of course the climate had great influence on these trees, which were peculiarly susceptible of influence from light and climate in various ways. His object had therefore been that the Government should not confine their attention to *Cinchona succirubra*, but that they should devote it to other species in proportion as they were found to be valuable. The object of his paper was, partly, to enforce that view of the subject; and he showed that the *succirubra*, though so rapid in its development, was not so good as the other. He had not had an opportunity of examining the *Calisaya* upon so large a scale, but it was a better tree, although very delicate in its predilections; and he scarcely knew what to say about the success of, that species. He had seen specimens from Darjeeling which looked exceedingly good, although they did not bear out the full idea he had formed from the appearance. He did not know why. With reference to Professor Bentley's question, he remarked that he had not had any very great experience in the barking of the roots; and, therefore, what he had said about root barks must be taken as founded on a limited experience. When the roots run under moss, he had no doubt the bark on them would be very rich; but it was very different otherwise, for when the roots penetrated deeply into the ground it was thin and worthless. Mr. M'Ivor succeeded in getting the greatest products from roots covered with moss, and he (Mr. Howard) had no doubt Dr. De Vrij was right in that respect, and to him he readily yielded the palm.

Mr. Brady said he would propose a vote of thanks to Mr. Howard for his excellent paper, in order that he might, by a sort of side wind, have the opportunity of saying two or three words upon the subject which had been introduced to their notice. He apprehended there was no one present who had a right to speak critically concerning cinchona barks or their products after Mr. Howard had spoken. Some years ago he had an opportunity, partly through the kindness of Mr. Howard, of following certain of that gentleman's researches in connection with the microscopical structure of cinchona barks, and since that time he had accepted with implicit faith everything that Mr. Howard said in connection with them. He had been asked by the editors of the Pharmaceutical Journal to review Dr. Berg's 'Anatomischer Atlas zur pharmazeutischen Waarenkunde,' and he had then been led to examine critically the microscopical structure of a considerable number of the varieties of barks found in commerce. It was well known to them that the late Dr. Berg, of Berlin, had opposed Mr. Howard's views relative to the condition in which the alkaloids occurred in these barks. Dr. Berg's researches were followed by Delondre, by Phoebus and others, with some confirmation; but he was bound to confess that, having investigated the subject with all the care that he could, he came to the conclusion that Mr. Howard was entirely in the right. It was only due to Mr. Howard, who was kind enough to supply him with part of the specimens which had come under his examination, to make this acknowledgment; and, to put himself in order, he would now move that their cordial thanks be given to Mr. Howard for this and his other contributions to the history of cinchona barks.

The President said it was unusual to put a vote of thanks in the course of the proceedings, but on the present occasion he felt great pleasure in being called upon to put such a resolution, because he felt, as he had no doubt they all did, that they were greatly indebted to Mr. Howard for everything he brought before them in connection with cinchona barks.

The resolution having been cordially agreed to,

Mr. Howard briefly acknowledged the compliment, and took the opportunity of saying that his views on the points alluded to had been confirmed latterly by Mr. Broughton in India and M. Carles in Paris.

Pharmacy in America.

The President mentioned that, according to the programme of the evening's proceedings, Mr. Greenish would read a paper upon "Pharmacy in North Germany;" but previously to doing so, perhaps they would permit him (the President) to mention that they had present that evening a gentleman who lived at a great distance from the metropolis, and whom, consequently, they did not often see amongst them. He alluded to Mr. Brady, who had just returned from America, where he had seen and heard a great deal in connection with pharmacy; and he should feel much obliged to that gentleman if he would give them that evening some account of his journey and reception on the other side of the Atlantic.

Mr. Brady said that he would not question the right of the President to change the ordinary course of business by calling upon an inconspicuous pharmacist to give his experience on some entirely foreign subject, but he really scarcely knew what to say, or what was expected of him. It was true that he had been to America and only recently returned, and that his object in going there was, in part, to attend the meeting of the American Pharmaceutical Association, a body which, as they knew, resembled in many respects the British Pharmaceutical Conference rather than the Pharmaceutical Society of Great Britain. He did not know how he could muster the presumption, with his friend Mr. Howden in the same room, to offer any observations about American pharmacy. Was it not all written in the chronicles of their Journal? Did not Mr. Howden read in that room a most elaborate discourse on the condition of pharmacy in America, which, if he recollected rightly, was considered so important that a second meeting was called to discuss it? He had no idea half an hour ago that he was going to be called upon to make any statement with regard to his American visit; indeed, he thought that, having travelled all night, without the advantage of a "sleeping-car," he should have been allowed to go quietly to bed. And now he had been called upon to speak of pharmacy in America. Had they any idea what pharmacy in America was? Pharmacy in England was represented by a district some 600 miles from end to end; but to speak in any general terms of pharmacy in the great continent of America would, unless one had very full time for consideration, a very long paper to do it in, and a very patient meeting to read it to, be simply an absurdity. And yet pharmacy in America was very similar to pharmacy in England. Take it all in all, he did not find in the few weeks he spent in the United States, any very marvellous difference between the pharmacy or pharmacists of the two countries. It had been told to one or two of the American pharmacists that he, in a semi-official capacity, purposed to visit the United States and to attend the meeting of the American Pharmaceutical Association in St. Louis. Almost before his baggage had passed the Customs House, he was saluted by a pharmacist of New York, who had come down to the landing stage to meet him, and to see that he was comfortably provided for. And from that moment till the time of his departure he never ceased to experience their kindness and their thoughtfulness. That was the best testimony he could give to pharmacy in America. But here they were met to consider pharmacy in a somewhat different aspect from its relation to hospitality, and hence came his embarrassment. He scarcely knew, unless they would tell him, upon what salient points of pharmacy he was to speak. Mr. Howden had told them, in far better language than he could command, what pharmacy was as a business throughout the States; and he (Mr. Brady) feared that if he went into matters of pharmaceutical science without deliberation, he should only come to grief. Whilst he was in America he saw something of pharmacy in, perhaps, the six largest cities of the Union,—in New York, Brooklyn, Philadelphia, Boston, Baltimore, St. Louis, and Chicago; and he did not find amongst the leading pharmacists, amongst whom he had the pleasure chiefly of moving, any great difference from the same class of men in half-a-dozen of the largest towns in England and Scotland. There were some differences, but these were in matters of detail, depending on the somewhat altered conditions of life. He must, therefore, if he were to say anything, talk about the meeting of the Pharmaceutical Association in St. Louis, because, in that respect he had his one advantage over Mr. Howden. At the meeting at St. Louis he found assembled the leading pharmaceutists of America, men whom they all knew so well by name,—Professors Proctor, Parrish, Maisch, Ebert, Bedford, and the rest; and was delighted to find one representative of Great Britain besides himself, Mr. Saunders, of London, Ontario,—a better man to represent the Dominion of Canada in the Pharmaceutical Convention of America there could not be. The Convention at St. Louis did not differ so very much from one of those Conferences which many present had the pleasure to attend from year to year in Great Britain. Papers were read, discussions indulged in, a large amount of social entertainment took place, in fact, it was just one of those occasions that seemed calculated to make pharmaceutists think a great deal better of each other; it was a gathering eminently qualified to make head against the tendency that trade had to make one forget professional etiquette. He did not wish to make comparisons, because the American Pharmaceutical Association did not represent exactly the British Pharmaceutical Conference. The American Association represented the United States as a whole; therefore, if they compared the results shown at one of these conventions with the work done in England during the year, they must take the work of the Pharmaceutical Society and the Pharmaceutical Conference jointly as representing Great Britain. And really he was very glad to find that there was some mitigating circumstance of that sort, because the amount of good, solid earnest investigation, the results of which were brought forward at the four days' meeting in St. Louis would, he confessed, have made him feel just a little doubtful in making a comparison between that meeting and a meeting of the British Pharmaceutical Conference. He would mention specially the amount of valuable research that was brought forward in their "Reports," such as, for instance, that on the Progress of Pharmacy, or the Report on the Drug Trade, or that on Adulterations and Sophistications which were brought forward at the meeting, and he did not know that in England they could show anything parallel to them. He regretted to have to say so, but it would not be right towards this Society, nor just to them, to withhold it. There were some points—and upon these special points he did not intend to speak—in which he rather preferred English ways to American. He went to America to see, to listen, and to learn; and he trusted that, if he had learned aught, when the events of the last two or three months had come to something like a reasonable focus in his brain, he might be able to speak better about them. But, at present, he could think of little except the kindness, the consideration, the constant welcome he received, the inquiries after pharmacists in England, the delight evinced in hearing of any success that had come to pharmacy in this country, and of the brotherly feeling displayed in every possible way, and on every occasion, whilst he was amongst their friends in America.

The President remarked that, after what they had heard, he was sure they would not find fault with him for having suggested that Mr. Brady should address them that evening.

Mr. Thomas Greenish, F.C.S., then read a paper on "Pharmacy in North Germany and Austria," which will be found printed at p. 363.

The discussion on Mr. Greenish's paper was deferred to the next meeting; and, in addition to this discussion, the President announced that papers would be read on "The Substitution of Proportional Numbers for Specified Weights and Measures in the Description of Processes in the Pharmacopœia," by Professor Redwood, and on a "Method for the Estimation of Morphia in Opium," by Mr. John T. Miller.

The meeting then adjourned to Wednesday, December 6th.

Provincial Transactions.

HULL CHEMISTS' ASSOCIATION.

The Third Annual Meeting of this Association was held at the Cross Keys Hotel on the 19th of October. The Secretary having read the report and the balance sheet for the past year, the adoption of the same was moved by the President (Mr. Baynes), and seconded by the Vice-President (Mr. Smith).

The election of officers for the ensuing year was then proceeded with, when Mr. A. Pickering was elected President, Mr. H. Smith, Vice-President, Mr. C. B. Bell, Hon. Sec. and Treasurer, and Messrs. Stanning, Baynes, Earle and Myers, on the Committee.

Cordial votes of thanks were accorded to the retiring officers for their services during the past year, which were respectively acknowledged.

The chemical and materia medica session will commence on Thursday evening, the 26th of October, at the Society's room in the Church Institute: lecturer, W. A. Rudd, Esq., M.R.C.S.

LEEDS CHEMISTS' ASSOCIATION.

The Annual Meeting of this Society was held in the library on Wednesday, October 25th, 1871; the President, Mr. Smeeton, in the chair.

The minutes of the last meeting having been read and confirmed, Messrs. T. M. Mitchell, J. R. Richardson and Crampton were elected associates.

Mr. E. Thompson, Vice-President, read the report as follows:—

Your Committee have to report that during the past session papers have been read as follows:—The President's Address,—History of a Fungus, by Mr. James Abbott,—On Dispensing, or who ought to do it, by Mr. J. L. Roberts,—On the Preparation of Vin. Ferri, by Mr. James Abbott,—On Sp. Ammoniæ Co., by Mr. F. Reynolds. These papers were very interesting and instructive, and afforded excellent opportunities for discussion.

The fourth meeting of the session was occupied in considering the proposed regulations for the storage of poisons, introduced again by the Council of the Pharmaceutical Society, and your Committee invited all the chemists and druggists in business in this town, thus giving them an opportunity of discussing the question. Whilst regretting the meagre response to this invitation, your Committee feel confident that the zeal and energy with which the few present opposed the attempt to make these regulations compulsory, was heartily appreciated by the trade. The feeling of chemists throughout the country coincided so thoroughly with this opinion that the Council of the Pharmaceutical Society withdrew from the attempt to pass compulsory regulations upon the storing of poisons. Soon after this, Dr. Simon introduced into Parliament a Pharmacy Bill, the essential objects of which were to enforce, under penalties, the storing of poisons and to compel the use of a special poison bottle. This measure roused an opposition from the whole body of chemists throughout England and Scotland, such as has never been elicited by any other question. In the organization needful to represent this feeling the chemists of Leeds took their share with the greatest unanimity of feeling, and employed their party influence with an effect that gave them the greatest encouragement. The Committee trust that the energies of the members may in future be used more profitably than in thus defending their body from uncalled-for and mischievous interference, but should the emergency again arise, the Committee are confident that the feelings of the chemists of Leeds will be expressed with similar earnestness.

Financially, the past session has been a success, the introduction of cheap postage and the collection of subscriptions by Mr. Roberts and some of the Committee, having tended to the interests of the Society. The amount saved in the cost of a room for the monthly meetings is not quite so satisfactory, as showing the limited attendance. It is hoped the necessity of being firmly cemented together, as proved during the struggle against the proposed Pharmacy Bill, will be the means of causing a better attendance at these meetings for the future.

In consequence of private engagements, Mr. Roberts, who kindly offered his services as Secretary last year, has intimated that he cannot continue the office another year. Your Committee acknowledge the zeal and earnestness with which Mr. Roberts has conducted the business of the Society.

Your Committee have reason to hope that Mr. Yewdall, who has so efficiently performed the duty of Secretary almost uninterruptedly since the commencement of the Society, may be induced again to accept the office which ill-health alone compelled him to resign.

The following donations to the Library and Museum have been made during the past year:—The Pharmaceutical Journal, monthly: from the Council of the Pharmaceutical Society,—Specimens of the Organic Constituents of the British Pharmacopœia: from Messrs. Southall, Son and Dymond, Birmingham,—A Glass-case to hold Materia Medica Specimens: from Mr. Reynolds. The following periodicals have been regularly supplied to the Library:—The *Chemist and Druggist*, *Chemical News*, *Nature*, and *Science Gossip*.

During the past year an additional Book-case has been erected, and your Committee have to acknowledge a special donation of ten pounds from the Council of the Pharmaceutical Society, to be expended in the purchase of books. These books are now upon the table, and will be considered a valuable addition to our already carefully selected Library.

Your Committee arranged with Mr. Abbott to deliver a course of twenty lectures upon botany in the Library, the attendance being very satisfactory. Chemistry classes have been held in the Mechanics' Institution by Mr. George Ward, F.C.S., and at the Young Men's Christian Institute by Mr. Jeffreson, F.C.S. Associates of the Society have the privilege of attending these lectures at the lowest fees.

Your Committee believe that the objects of the Society have been thoroughly maintained, and trust its usefulness will be the means of bringing additional members and associates into our ranks.

The Treasurer's account was also presented, and showed a balance of £7. 6*s.* 7½*d.* in favour of the Society.

Mr. R. M. Atkinson proposed the adoption of the Report, and regretted the meagre attendance. He thought that too much had been done for the associates and too little for the members; and he hoped the Committee would endeavour to make the meetings attractive to the members as well as associates. He thought an effort should be made to induce the retail chemists to close earlier, and if such a desirable course could be adopted, he had no doubt the meetings would be better attended.

Mr. James Abbott seconded the motion, and re-echoed Mr. Atkinson's remarks respecting the attendance. He hoped the present session would be an improvement upon the last in this respect.

The motion was carried unanimously.

The election of officers for the ensuing year was then proceeded with, and the following declared elected:— *President:* Mr. E. Brown. *Treasurer:* Mr. J. Land. *Curator:* Mr. E. S. Payne. *Librarian:* Mr. T. Wilson. *Honorary Secretary:* Mr. E. Yewdall. *Committee:* Messrs. Wm. Smeeton, J. Day, F. Reynolds, T. B. Stead, J. Beedle, E. Atkinson. *Auditors:* Messrs. George Seley and J. Longfield.

In vacating the chair, Mr. Smeeton acknowledged the kindness shown by all connected with the Society during the time he had held office as President. He recommended that this Society, and all other kindred institutions, should offer greater facilities for young men than at present. Why should not associates of this Society be able to go before the examiners and pass their examinations creditably, without going to Bloomsbury Square? They had great facilities at present, and he had no doubt the Committee would endeavour to provide for any deficiency that was found to exist.

Mr. E. Brown, having taken the chair, thanked the members for intrusting him with their confidence by electing him to the office of President. He assured them that he had little time at disposal for such a responsible office; and had he not been satisfied those who were elected to work with him would render great assistance, he should have shrunk from the duty. He thought that they were doing much to assist young men to pass the examinations. They had in Mr. Megilley's class a means whereby youths could be prepared for the Preliminary Examinations, and in Mr. Abbott's botany class the associates had an excellent opportunity of becoming acquainted with this science. He had great pleasure in proposing, "That the best thanks of the Society be given to the retiring officers."

This resolution was seconded by Mr. Anderson (associate), and carried unanimously.

Mr. Smeeton briefly acknowledged the compliment on behalf of those who had been associated with him during the past year.

Mr. J. Day proposed, "That the best thanks of the

Society be given to the Council of the Pharmaceutical Society for the special grant of ten pounds, and also for the PHARMACEUTICAL JOURNAL (monthly) to the library, which was seconded by MR. E. THOMPSON, who took occasion to remark that he could not quite endorse the opinions which had been expressed by previous speakers with respect to the education of the young men. In the well-appointed laboratories of the Mechanics' Institution and Young Men's Christian Institute, so ably conducted by two members of our Society, he thought the young men connected with the trade had excellent opportunities afforded for making themselves acquainted with theoretical and practical chemistry,—such facilities, indeed, as we could not offer except at a great outlay of capital, which would not be remunerative. It would be quite in accordance with the objects of our Society to continue the lectures on botany.

MR. RHODES moved, and MR. YEWDALL seconded, a vote of thanks to Mr. Reynolds, F.C.S., for the gift of a glass case to hold materia medica specimens, which was carried unanimously.

In conclusion, MR. HIGHMORE (associate) urged the Committee to endeavour to obtain shorter hours of business.

MIDLAND COUNTIES CHEMISTS' ASSOCIATION.

The Monthly Evening Meeting of this Association was held on Thursday evening, the 26th of October; the President, MR. GEORGE DYMOND, occupied the chair. There was a large attendance, the reading-room being quite full.

In introducing the paper of the evening, by Mr. William Southall, the PRESIDENT remarked that the subject was one which could not fail to interest those who were present who had yet to submit to the ordeal of examination. So far, however, from regarding a preparation for the examinations of the Pharmaceutical Society as an oppressive burden, he thought that a just view of the advantages of study in its effects upon the mental powers, and of the benefits to be gained in the acquisition of knowledge, should stimulate the student, whose life would thus be raised above the mere drudgery of the shop and ennobled by high and worthy aims, whilst an additional motive might well prompt his endeavours in the reflection that his studies had for their ultimate object the mitigation of human suffering.

[We purpose printing Mr. Southall's paper *in extenso* in next week's issue.—ED. PHARM. JOURN.]

VACANCIES AND APPOINTMENTS IN CONNECTION WITH PHARMACY.

The Editor will be glad to receive early notice of any vacancies of pharmaceutical offices connected with public institutions, and likewise of appointments that are made, —in order that they may be published regularly in the Journal.

APPOINTMENTS.

Mr. James Richard Gardner, A.P.S., has been appointed Assistant Dispenser at the Royal Naval Hospital, Plymouth, *vice* Mr. Benjamin Marks, Pharmaceutical Chemist, appointed Dispenser and Medical Storekeeper at the Royal Naval Hospital, Chatham.

The following journals have been received:—The 'British Medical Journal,' Oct. 28; the 'Medical Times and Gazette,' Oct. 28; the 'Lancet,' Oct. 28; the 'Medical Press and Circular,' Nov. 1; 'Nature,' Oct. 30; the 'Chemical News,' Oct. 28; 'English Mechanic,' Oct. 27; 'Gardeners' Chronicle,' Oct. 28; the 'Grocer,' Oct. 28; the 'Journal of the Society of Arts,' Oct. 28; the 'British Journal of Dental Science' for November; the 'American Chemist' for October; the 'Journal de Pharmacie et de Chimie' for September; 'Zeitschrift des allgemeinen österreichischen Apotheker-Vereines,' October 20; 'Neues Repertorium für Pharmacie,' Sept. 9; the 'Chloralum Review' for November; 'Evans, Lescher and Evans' Monthly Price Current.'

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

PROVINCIAL EDUCATION.

Sir,—A few facts may possibly assist the successful theorizing of some of your contributors in reference to Provincial Education; I regret that those I have to communicate are painful ones, since they relate but to failure and disappointment.

In the autumn of 1868, when the requirements of the Pharmacy Act were fresh in all minds, the Manchester Chemists' Association established classes in chemistry, materia medica and Latin; 62, 58 and 49 entries were respectively made in these, and a good average attendance was obtained; encouraged by such a ready response, we applied to Owens College for co-operation, and a special course of instruction for pharmaceutical students was arranged. Our lecturers were, on Chemistry, Mr. Schorlemmer, F.R.S.; on Botany, Professor Williamson, F.R.S.; on Materia Medica, Mr. Somers (now and for many years past lecturer on the same subject in the Manchester School of Medicine), and on Latin, Professor Wilkins, M.A. The fee was 15*s.* per course of twenty-seven lectures, with a considerable reduction in the case of those who attended several classes. The ardour of our students had, however, cooled, and comparatively small classes were formed. The following session renewed efforts were made by our Association, a special course on pharmacy was added, an accomplished local pharmacist, Mr. Louis Siebold, being appointed lecturer; nevertheless, our classes dwindled, and this session we have been obliged to close those on pharmacy and materia medica, because the minimum number of entries (10) could not be obtained. The chemistry, botany and Latin classes continue working, being open to other than pharmaceutical students. Here is another "mournful sentence" for Mr. Ince. Can he point out who is to blame? Our lecturers were men of undoubted ability, and enthusiastic teachers; we were connected with one of the most eminent science schools of the kingdom; and our prizes were distributed by the Lord Bishop of Manchester! What more could our students desire?

For myself, I believe the causes of our failure to be many, but chiefly, I fear, the disinclination of young men to enter upon the serious study of the various subjects in our curriculum,—a putting off of the evil day, in the hope that something may turn up to relieve them from the necessity of meeting it, and a trust in the vaunted powers of "rapid preparation" men to assist them at the eleventh hour if need be. Some of them have discovered that mere attendance at lectures does not qualify them for the examinations; and as they have not been accustomed to regard the acquirement of knowledge for its own sake as desirable, but only as a means to an end, that end being the examinations, they are dissatisfied with what appears to them the indirectness of the means, complaining that the Latin taught is not "pharmaceutical" Latin, nor the chemistry "pharmaceutical" chemistry, etc. But can we expect young pharmacists to be wiser than young doctors, or other young men? Cramming is one of the evils of our day, and it will test the skill of our examiners to find out where it has been resorted to, that they may do the candidates the kindness of sending them down. Professor Huxley recently said in Manchester that he had had the satisfaction of plucking sixty out of seventy papers from one school where he knew cramming was practised. Let our own examiners follow this good example, and we shall soon have less of it, and more healthy study amongst our assistants and apprentices. Some excuse must be made for those who were engaged in the business before 1868, and were taken unawares by the Pharmacy Act. For them the Minor might, perhaps, be a little relaxed; but those who have deliberately joined our ranks since that date should feel it an honour that so much is expected of them. That some of the responsibility of our failure rests with the masters I doubt not,—the relation of master and apprentice is scarcely yet adapted to the new pharmaceutical era. The importance of getting well-educated apprentices has been frequently alluded to; equally important is it to the progress of pharmacy that the apprentice gets a good master, one who, though he may not, for one or many reasons, personally undertake the teaching of all that his apprentice has to learn, shall at least afford him opportunities for study, and encourage him by a kindly interest in his work at a time when sympathy is so powerful an influence for good.

It is but poor consolation to find from the reports of some other local Associations that we in Manchester are not alone in our disappointment. We are discouraged, but not without hope. We feel assured that by avoiding anything like "special preparation" classes we have done rightly, and we now await a possible kindling of the desire for knowledge which is something far different from the mere wish to get through examinations.

Market Place, Manchester. F. BADEN BENGER.

Sir,—Although Mr. Mason in his letter on provincial education, which appeared in last week's Journal, expresses his concurrence with Mr. Smith's first and third propositions, his objection to the third would nullify the entire plan, for in that proposition is enunciated the principle upon which the details of the scheme rest, and it appears to me that, as far as it goes, the principle is perfectly just. It maintains, as I understand it, that as it is compulsory for every member of the trade to pass the Minor before opening a business, so it is a necessity to provide means for him to do this.

But I apprehend there would be no necessity for the local associations, as educating bodies, to limit their teaching to Minor subjects, only whatever was done further it could not be expected would be supported to such an extent by grants from the Pharmaceutical Society.

Mr. Mason seems alarmed lest, having passed the Minor, the apprentices should be contented to rest on their laurels, and it does certainly appear that there are some grounds for his apprehension. But the line of action which he indicates when he says that the course of teaching should be without reference to any examination, would not have so good a chance of success as would a course of preparation for the Minor with the teachers endeavouring to interest their pupils in the subjects. This might lead to their pursuing study for the very love of it. Besides this, Mr. Mason must forget that the success, and, indeed, the existence, of provincial associations depends upon the attendance of apprentices; and if these latter cannot find in the course of study provided for them a direct bearing upon the Minor, they will terminate their connection with the Association, and fall back upon an actual cram at home, thereby bringing to pass the very evil he would prevent, as well as leading to the breaking up of the Association.

Norwich, October 25th, 1871. E. NUTTALL.

THE PRELIMINARY EXAMINATION.

Sir,—On looking over the Journal of Saturday last, 21st inst., I noticed the large amount of failures in the Preliminary Examinations, the number of which is sufficient to astound the most unthoughtful of our learned body; but more particularly is the fact conspicuous in the glaring result amongst the candidates examined in the largest towns, and I am led to ask, "How can these things be?"

I will take, for instance, the undermentioned cities and towns, viz.:—

	Candidates examined.	Candidates passed.	Candidates failed.
London . . .	30	9	21
Manchester . .	9	3	6
Birmingham . .	2	0	2
Derby	4	2	2
Peterborough .	4	0	4
Swansea . . .	5	0	5
Taunton . . .	4	0	4
Aberdare . . .	3	0	3
Aberdeen . . .	5	1	4
Carmarthen . .	3	0	3
Chester . . .	3	0	3
Wolverhampton	2	0	2
Total . .	74	15	59

I find, upon consideration, that twelve cities and towns have contributed fifty-nine out of eighty-two failures. The above twelve may be branded, without any illwill whatever, with the significant words, "Weighed in the balance and found wanting." I would ask all connected with the Society the why and the wherefore of these lamentable statistics. How many of the candidates examined in London and Manchester reside in those two places? for I cannot conceive of the majority, being engaged in business in those two places,—having the privilege of such abundant facilities of education, enjoying the advantage of every necessary work to enable them to cultivate their minds sufficiently to acquit themselves honourably in much more advanced examinations,—coming so far short as to be plucked in an ordeal which every ordinary schoolboy might go through with ease. I would also ask, How many of the number have attended morning, noon, or evening classes?

In conclusion, I would advise my brethren in the large towns not to be so continually sending their darts at us poor country druggists, and at our manner of conducting the honourable profession in which we are engaged, but to look at home, to guard the flock over which they are placed; not only to provide food for their young, but to see to it that they eat and digest it with an earnestness of will beyond all doubt. By so doing, such calamities as the one in question will be averted. "SPES."

Barnsley, October 25th, 1871.

IMPROVED TINCTURE PRESS.

Sir,—My press is not quite understood; perhaps I am at fault for not explaining that the double power is obtained, not merely because it has two screws (for each has the double power to a limited extent), but because they convert the cross-beam into a lever in the second position. Your young readers will better comprehend it by this line A ———— C
B
(or *vide* any work on mechanics), the prop, or fulcrum A, being represented by the end of the cross-beam secured at rest by the nut; the weight B by the centre of the block, and the power C by the other end where the power is applied (these positions being reversed as each screw is used alternately); consequently as the line A C is + A B, so is power applied at C + what such power would be if applied direct at B, *i. e.* in this case double. I might have described the theoretical power of each screw as doubled by the leverage of the cross-beam; the result would have been the same, but as two screws must be used, I thought it simpler to describe it as so much for each. Now we will suppose *two* persons employed in screwing my press, as your correspondent suggests, what power would then be obtained? Exactly the same, not one additional pound, either theoretical or practical, as the two persons could but act as power and fulcrum to each other. I am surprised that so important a part of the principle as the leverage of the cross-beam should have escaped the notice of any one so well up in mechanics as your correspondent Mr. Brown appears to be, and equally so at his misunderstanding what I stated about the size of the screw affecting the power. Mr. Brown says, "no increase or diminution of the *circumference* of the screw will affect it;" granted, but I never used any such expression. I objected to the *bulk* of the screw generally, large screws being manufactured with a proportionately larger thread than small ones, although I see no reason why a fine thread should not be cut on a large bolt; but as they are not so manufactured, my objection is well founded. I should also wish to ask him if he has ever seen a sheet of block tin before it has been beaten into shape, which sometimes approaches a hemispherical form. To bear this its strength and substance must be something considerable; in my opinion, a small cylinder of it riveted, as I suggest, would be up to any pressure required in the retail laboratory, but would not bear what might be applied by such a press as mine. What that pressure really is I regret not being able to inform your correspondents, having no means of testing it; but theoretically it works out, as I have stated, to about three times as much as several of your correspondents agree in assigning to the press in general use. Allow me to remind your readers that my simple little press is not in a position to bear the severe tests to which some wish to subject it. As already stated, it was rudely constructed in the cheapest manner, merely as a pattern or working model, to experiment upon to discover the faults to be corrected in one of superior workmanship.

Now my press has only a pair of iron screws; the nuts were correctly made to my model, but unfortunately the smith only welded the spiked ends on instead of forging it from one piece, consequently both handles broke off from one of the nuts. The smith having emigrated, and no other in the neighbourhood having exactly the same pattern, I have had the nut imbedded in a wooden handle, and as one of the others seemed inclined to follow its example, I have been obliged to use the press very cautiously; even under these disadvantages it has met the requirements of my business, but it was hardly fair to subject it to this severe test.

A neighbouring chemist brought me a small cylinder containing the marc of forty ounces of tincture of orange-peel, from which he stated he had pressed off thirty-nine ounces, which I consider a very successful result by a single screw press, but he brought it to me to see if I could get any more out of it by my press. I transferred it to my cylinder, and even in the crippled state of my press soon produced a couple of drachms more, when the other handle, breaking off, compelled me to discontinue the experiment.

Several minor points of improvement suggest themselves for consideration before any of your readers attempt the construction of such a powerful press as I advised in my letter in the PHARM. JOURNAL, Oct. 21. For instance, the cylinder should be made of tolerably stout sheet-iron tinned, the female screw must be of great strength and beautifully cut. I should recommend a piece of one inch square iron bar, with a hole punched in the centre to receive a piece of steel to be welded in, and the screw thread cut in it. The ends must be hammered out, not welded on. Such a fine screw must be carefully preserved from injury by contact with the touch-plate. A flange filed (or rather turned) at the base of the nut, and fitting into the hole in the plate, would secure the screw from any contact with it. (If any of your readers fail to quite understand me, I will send them a model in cork or wood by post.) The top of the press block should be slightly convex, to ensure the pressure being in the centre, also to aid the leverage of the crossbeam, and some other points not affecting the general principle of the implement, the excellence of which I am sure the majority of your readers will approve. The superior method of applying the power so as to pull the screw instead of pushing it—discarding the cumbersome iron frame—great increase of power, moderate expense, etc., are all advantages too important to be overlooked.

I quite agree with the excellent suggestion of your correspondent to increase the depth of the cross-beam. I purposely sketched it slighter than the model, which I thought too thick, and intended planing down, to increase its elasticity, but I now think it unsafe to reduce its strength. Might I ask some of your readers with a better knowledge of mechanics than myself to favour me with their opinion on the proposed spring? It is quite imaginary, and would not directly increase the power, but it might enable it to be applied with greater ease, and by its automatic action diminish labour. Also to point out (not by taking exception to a term, but *bonâ fide*) any errors they may discover in what I have stated throughout this controversy, except the vexed question of power; as my calculations have all been expressed in the simplest terms, the errors will be easily detected.

October 30*th*, 1871. C. A. STAPLES.

Sir,—Will you kindly allow me a small space in the Journal to make a few remarks in favour of Mr. Staples' Tincture Press?

It is now several years since I left Mr. Staples' employ; and since that time I have occupied several situations both in the suburbs of London and in first-class provincial towns, and I have never met with a tincture press that so well answers the purpose of a retail druggist as the one described by Mr. Staples (PHARM. JOURN. September 9th).

One of the principal objections to other presses that I have used is, that they are too heavy and cumbersome; now Mr. Staples' press, on the other hand (as he mentions in his letter, PHARM. JOURN. October 14th), is portable and light. And, again, another improvement is the double screws, which enable one to so materially increase the pressure on the marc. I well remember (although it is so long ago since I used the double-handled press) how often I have taken out the residue after completing the expression, and noticed with surprise how perfectly every drop of spirit seemed to have been pressed out; so much so, indeed, that one would scarcely believe, on breaking up the dry residue, that it had ever contained foreign moisture in the shape of spirit.

I mention this simple fact, because it does apply to Mr. Staples' press, and it does not apply to other presses that I have used.

In conclusion, I would remark that if Mr. Umney had endeavoured to make a few practical suggestions for improving upon Mr. Staples' principle, instead of making it such a *sine quâ non* to prove the theoretical pressure, he would have more probably obtained the thanks of the trade in general.

W. WATTS, A.P.S. by Exam.

Campden, October 24*th*, 1871.

THE LIBRARY AND MUSEUM.

Sir,—Through the medium of your Journal, I beg to suggest what I think many, including myself, would find of great advantage, namely, the opening of the Library and Museum of the Pharmaceutical Society, say, for only two evenings a week, until 9 or 10 o'clock, instead of closing at 5 o'clock, as at present; thus giving many, who have one night a week for recreation, the benefit of that Institution. I hope this may not be overlooked.

16, *Cambridge Street*, A CHEMIST'S ASSISTANT.
Hyde Park Square, Oct. 18*th*, 1871.

EVANS AND SONS' MATERIA MEDICA CHEST.

Sir,—Will you allow me, through the medium of your columns, to thank Messrs. Evans and Sons, of Liverpool, for the five-guinea materia medica chest which they have presented to the Tyneside Chemists' Assistants' Association.

Much as may have been written with regard to the usefulness of this collection, too much can hardly be said in favour of it. It seems to me as complete as is possible, and the arrangement as perfect as so large a number of specimens in so small a comparative space will allow.

ALFRED BRADY, *Hon. Sec.*

29, *Mosley Street, Newcastle-on-Tyne, October* 21*st*, 1871.

"*Chemicus*" is thanked for his letter criticizing the doctrine of "skin tanning," but as we have already said, the discussion of this subject would be more appropriate in a medical journal.

W. S. Goyne.—The manufacture of acid chromate of potash is described in most chemical works.

B. Keene.—*Tamus communis.*

G. B.—We are unacquainted with the plant.

"*Peltatum.*"—The subject of your letter was fully discussed both in our columns and at the Council table of the Society for some years before and up to the time of the passing of the Pharmacy Act, 1868. It was then considered that, having due regard to the various interests affected, the titles mentioned in that and the first Pharmacy Act were the best that could be continued. We regard the question as having been settled. It would serve no good purpose to reopen it.

G. A.—The Secretary will communicate with Mr. Drewe on the subject of your communication.

"*Gelatine.*"—*J. C. K.* fully endorses Mr. Hustwick's remarks respecting the gelatinizing of tinct. kino. He has made large quantities without having found it to change, a result which he attributes to his having used the granular form or "gruffs" of the gum.

J. Bairnsfather (Kentucky) is thanked for the newspaper cutting forwarded by him. We think, however, that such a romantic story would be out of place in the PHARMACEUTICAL JOURNAL.

X. Y.—A student may enter the laboratory for a shorter period than a month, but the lowest fee is £2. 2*s*.

Dispensing Charges.—We have received a letter from "*A Youngster in the Trade, but a Lover of Fair Play,*" in which the writer expresses his indignation at the conduct of those who vend a six-ounce mixture for ninepence, or submit to dictation from their customers as to the price that should be charged. Lamentable as such conduct may be, we are afraid that the punishment for it which our correspondent proposes, that they should "be served as soldiers are when they desert or do anything very bad, viz. kicked out of the army and better men taken in their place, with better principle," is one that could not be carried out profitably in the present state of the English law.

W. S. N.—(1.) We think our correspondent was indiscreet in asking his customer the question. No pharmacist would make such a charge as he mentions. (2.) Having poured the tinctures into the bottle, let them completely moisten its sides, then mix and add the oils, and shake well; and lastly, add the cinnamon water, again shaking.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. J. Bush, Mr. J. T. Miller, "Juvenis," "Chemicus," "Quærens."

THE PRELIMINARY AND MINOR EXAMINATIONS.*

BY WILLIAM SOUTHALL.

As the studies of most of those now present have for their secondary, if not primary, object, the acquirement of sufficient knowledge to enable them to pass the examinations at Bloomsbury Square, and as I have the honour to be a member of the Board of Examiners, it was very natural that you should ask me to open the session by a paper on the subject. I have therefore hastily thrown together, as well as time would permit, a few practical hints that may be useful in your work of preparation.

Let me impress upon you that the object of the examination is not to force you to cram your heads with ill-digested knowledge that may or may not be ready when wanted, and will be pretty certain to evaporate quickly after the examination is over, but it is intended to ascertain if you are sufficiently informed on certain subjects to be qualified to perform certain duties. It is obvious that the great aim of study is to gain knowledge, which is power; the examination is a means to this end, not the end itself. One man may have an excellent memory, and trust to it too much, not taking the trouble to understand what he learns, and consequently his store will be of but little use to him; whilst another who has carefully sought out the bearings of his progress, although he may not have got through quite so much, will have obtained a mastery of his subject that will stand him in good service, not only at the examination-table, but for the purposes of his profession.

With the exception of Latin, the standard of knowledge required for the Preliminary Examination is one that ought to be possessed by every boy of the middle class before he leaves school; and, as regards Latin, it is now well known that a knowledge of it is required by those who enter the business, and, therefore, it becomes a parent's duty to see that his son has the opportunity of learning it. The education given at the British School here, is amply sufficient for the requirements of the examination in English grammar, composition and arithmetic, but then there is no Latin. At many of the grammar schools Latin is taught to the prejudice of English; whilst many of the private schools have the reputation of giving but a poor education. I suppose that each of these causes contributes to swell the hitherto large number of failures to pass, which must be annoying both to parents and pupils. The kindest and most judicious plan would be, for every druggist when he takes an apprentice, to require that he should first pass the Preliminary, as he would do so better when fresh from school; of course there are many cases in which this would not be practicable, but, as a general rule, the earlier the education of a boy is directed to the course he is likely to follow in life, the better it is for him. With regard to older men who have not had an early education in Latin, they will find it more advantageous to turn their attention to the two pharmaceutical books than to Cæsar, as much of the phraseology in these must be already familiar to them, and the number of Latin words in them is much less than in the latter; but whether they study Cæsar or not, they should attend the Latin classes now open to them.

We now come to the Minor Examination. The first subject in the list to be found in the printed regulations, is Prescriptions—reading prescriptions. If the student is engaged in a dispensing business, he has already in the course of his duties to translate prescriptions daily, but his knowledge requires extension. There are printed books, such as 'Selecta e Præscriptis' to study; there are also, in many large towns, volumes of autograph prescriptions which may be referred to, and these are especially useful. The Society owes to Mr. Ince's labours a splendid collection of such; and it is our own fault, as chemists of Birmingham, that hitherto we have had no portion of it, as until lately nothing has been done here to aid pharmaceutical education. Such being the case, I am glad to hear that steps are being taken by some of our younger members to make a collection, but in the meantime the volumes of copies which exist in most businesses of any standing are not to be despised. The collection of prescriptions in London is, I believe, available to students under certain regulations. As far as I have seen the prescriptions to be found in the examiners' volumes, those written by English physicians are not at all more difficult than the average generally met with in business; but when an examiner is told the same day that *undecimam* means nine, ten and eleven (or eleventh), or a candidate does not know what *urgente dolore* means, or says that the last word means solemn or dolorous, it is obvious that his knowledge of Latin is rather deficient. The man, too, who says that *manus* means body, or *sternum*, stern, would find still more difficulty in coming to a right conclusion as to the part of the body intended, if he met with "*Hypochondrio dextro*" in the prescriptions of a well-known Birmingham physician. A candidate may say when he meets with an unusual word, that if at home he would look for it in a dictionary, which is a reasonable remark; but dictionaries often give two or three meanings, and it requires some insight to choose the right one,—as in case of a mixture ordered to be taken, *spiritûs difficultate*,—and this can only be acquired by study or practice; moreover, words much abbreviated are hard to find. This brings us to the task of reading abbreviated words in full. To an assistant in good practice this is often more difficult than translating, unless he has a good knowledge of Latin, as most physicians abbreviate their words more or less, and thus he seldom sees them in their proper form. I would recommend the student to make a practice of writing out a prescription or two in full every day, taking advice from a pharmaceutical Latin grammar or other guide to begin with, when he will soon get into the right way, and the practice once gained will be easily followed. A little book, called Britten's 'Dispenser's Vademecum,' is a useful compendium of pharmaceutical Latin, and is arranged alphabetically. Practical Dispensing comes next on the list—to weigh, measure and compound medicines.

Misce S. A. was once a much more common affix to a prescription than it has become of late, but the art is, or ought to be, none the less understood. Nothing but practice and good instruction will make a good dispenser, but surely the importance of the office is worth the pains. Let us examine a few points in which a right or a wrong mode of procedure is evidenced. Firstly, in weighing. One man picks up his scales as if they burned his fingers, and they wobble about (excuse the word) in a most perplexing

* Read at a meeting of the Midland Counties Chemists' Association, Oct. 26th, 1871.

manner. I have often shown a young man the proper way of holding them, but this you will see is not an examiner's business, and ought to have been explained by some kind soul long before. Or, perhaps, another may have a piece of elastic paper on the counter under one of the scale pans, and wonder that the balance rises first high then low without any change of weight in either scale. Again, one holds his measure so that requiring half an ounce, he gets either three drachms or five, according as it is tilted backwards or forwards. So in making pills, one man will triturate in a mortar with care and precision all the ingredients, putting in first those that require most care in division, whilst another will throw them all into a mortar together, just as they come, coarse and fine; whilst as an extreme case, I may mention that I have seen a man satisfy himself with cracking crystals of sulphate of copper by means of a spatula until they were a little less than pins' heads, and then mixing and dividing them into 12 pills, all on a slab. The same with mixtures: if all the articles are hurried into a bottle "anyhow," the result is often most unsatisfactory, some mixtures having a totally different appearance if the order of mixing is transposed—to say nothing of powders that agglomerate. Then again, fractional parts of a grain puzzle some dispensers very much, but this will hardly be the case when the Preliminary has had its full effect; and that it is necessary to understand fractions, the prescription below that was dispensed a few days back, shows plainly.* The instructor of apprentices is often to blame for the way in which his pupils dispense. This will show itself in their weighing out a white powder on a dirty prescription, instead of using a clean paper, or in their using a two-drachm box to hold a dozen pills, or other manifestation of a niggardly economy that defeats itself, as more time is wasted in writing the label, for which there is not room, than would pay for a larger-sized box. Again, some are apparently taught to divide powders with a spatula, at which a few show considerable skill, but supposing the wrong quantity of any article be taken, what is to check the error, as they have not always an examiner overlooking them. A patient would probably be surprised, if one day he received a box of pills, and a few days afterwards one of powders from the same prescription, two powders for a dose, and yet this is an error that, unaccountably to me, I have so frequently noticed that I mention it; indeed, I have seen blue pill carefully rubbed to as near a powder as possible, and divided into papers, the prescription in the case being perfectly plain to read.

The prescriptions in use for dispensing at Bloomsbury Square are of necessity comparatively simple and easily dispensed, so that a fairly good dispenser has no need to be nervous; but if he be, it is easy to judge between nervousness and incapacity. I have alluded to the translation of directions for use, in my remarks on reading prescriptions, but in addition to those, it is well to observe that a label should be in elegant English as well as being a correct translation, as if it is so expressed that it can scarcely be understood it is but little better than if incorrect, as for example, "two pills to be taken every four hours, three times;" instead of "for three doses," and so on.

* Ext. belladonnæ gr. $\frac{1}{6}$, ext. stramonii gr. $\frac{1}{5}$, ext. cannabis ind. gr. $\frac{1}{3}$, ext. opii gr. $\frac{1}{2}$, ext. hyoscyami gr. $\frac{2}{3}$, ext. aconiti gr. $\frac{1}{3}$, ext. conii gr. j, P. glycyrrh. q. s.: ft. pil. mitte vj.

I have dwelt at some length on practical dispensing, on which, indeed, much more might be said, but it becomes the province of the teacher to give minute directions. These few general hints, however, may be useful to some; and in conclusion I would remark how essential are care and neatness, as some men scatter and throw about, in making pills and powders especially, almost as much as they use.

Next comes Pharmacy. This refers to the knowledge of what we term pharmaceutical preparations as distinct from chemical: firstly, as to ability to recognize them when seen and handled; secondly, as to knowledge of their composition and preparation. This latter knowledge can only be obtained practically by making them or by study of the British Pharmacopœia. It is most important that every pharmacist should know what he is using. If a customer comes in and asks him what compound rhubarb pill or compound tincture of cardamoms contains, or wants to know what confection of senna is made of, he ought to be able to give a correct answer. Likewise, if a surgeon asks how much ext. cannab. ind. is contained in a drachm of the tincture, it looks well not to have to consult the Pharmacopœia. He also should be able to recognize tinct. valer. and tinct. lupuli respectively, but for fear he might not succeed it would be well beforehand for him to put specimens of these and other preparations, tinctures especially, into ounce bottles and get some one to number them, keeping a key to the numbers; and thus he would exercise his nose—a most useful organ to a pharmacist—in detecting differences of odour, and his eyes in distinguishing shades of colour. It is well, however, that he should get good test samples, as bad ones would only serve to embarrass him. Squire's 'Companion' is a useful book in describing the appearance of preparations, and also in stating their strengths and doses.

Materia Medica.—Here again study from the articles themselves is required. The directions in the regulations are so clear that I cannot add much. It is important to have a good work on materia medica. Pereira is expensive but excellent; Royle and also Garrod are cheaper and are very useful books. For the student in the country or in a small business, where preparations are procured from the wholesale druggist, it is necessary that the student should take further steps to acquire a better acquaintance with the articles of the materia medica than the contents of the shop afford him. This may be obtained wherever there is a museum or from one of the collections of materia medica specimens that are to be purchased, with which many local societies are furnished, and they also give useful information in connection; but it is absolutely necessary that the student should, by some means, obtain access to specimens.

Botany.—I have given my views more at length on the study of botany in the PHARMACEUTICAL JOURNAL; but I would repeat, that it is far the best plan to commence with some elementary work, taking, at the same time, living plants themselves, common ones will do, and examining them in connection with your reading, getting the aid of a good pocket lens. Such a book as Oliver's 'Elementary Botany' leads the way in a most instructive and interesting manner to some knowledge of the structure, external organs and physiology of plants; and then, when his interest is awakened, the student will turn to 'Bentley' as a text book to perfect his necessary knowledge of details with much more pleasure than would otherwise have probably been the case. A mere book knowledge of botany partakes too much of the nature of a cram; and it is easy to tell whether a student has studied from nature or not. A student will learn (out of a book) the names of the different varieties of leaves; but if he is shown a lanceolate leaf he will probably say it is ovate, and other things in the same way, unless he has also studied from nature. It is to be hoped that next year the indigenous medical plants, and some others that are easily cultivated, will be grown at the Botanical Gardens, and that students will have liberty to go there, as such opportunities for study are very important, and will prevent the sad confusion that too often exists in the student's mind respecting the identity of English medicinal plants.

Next and last comes the great subject of Chemistry. We take our popular name of Chemists from our supposed acquaintance with this science; but chemistry has developed so wonderfully of late years, that it is but a very limited branch of its professors that pharmaceutical chemists represent. Still we ought to have a moderate knowledge both of theoretical and of practical chemistry, and many excellent chemists have sprung from our ranks. When young hopeful is brought by his father to the druggist, the latter is informed that the young gentleman has evidenced, by his fondness for experiments, his fitness for the profession; and it is to give this energy scope that he is placed behind the counter. Alas! it too often happens that the man of drugs looks blandly on his expectant pupil, but gives him little time to pursue his researches; or the latter, when he has time and opportunity afforded him, satisfies himself with burning his fingers and clothes, or making explosions and stinks. Now, however, that the examinations are compulsory, there is a great awakening to the necessity of early study; and to this the number of students who have entered their names for our lectures testifies. There is no royal road to chemistry; the turn for experiments is the first round of the chemical ladder, and the secret of the ascent is by perseverance and patient study, under proper guidance, to keep still getting higher. Let your motto be "Per aspera ad ardua tendo." Lectures on chemistry, as well as on botany, are of the greatest assistance, and should be attended if possible. An attendance at the working classes on chemistry is also a great help to those who have the opportunity. The regulations explain clearly the outline of the examination, so that I need not dilate upon it. Dr. Attfield's work on chemistry is most useful to pharmaceutical students, but it is well to take two works on the subject, as the student has then the benefit of different minds, and it is also well that the pharmaceutical bias should not be too strong.

I have now given a running commentary on the published regulations of the Board of Examiners, and, in conclusion, would remark that the use of the best books available on the different subjects is most advantageous to the student. To one who has studied observantly, a short synopsis is useful for occasional reference, but to any one who uses it as a "cram," it is apt to prove a delusion and a snare. There are few of us but forget much of what we learn; we are much less likely to do so, if we study thoroughly as far as we go. I have heard it said by or of such-and-such a student, that he answered almost every question, and was surprised that he had failed; and so probably he did, but his answers were perhaps almost all wrong. I think such men must have tried the ready method of cram, and experienced, to their cost, that it was a failure, as one who has really studied is generally more cautious in his answers, and has his understanding to guide him as well as his memory. I have taken the liberty to allude to some mistakes that candidates have made, but have no recollection who made them; indeed, the identity of the candidates is generally unknown to the examiners. The most painful part of an examination day, both to examiners and examined, is to hear of the failures, whilst the pleasantest to the examiners is the signing of a good crop of certificates. Examiners and examined have always been, and, I suppose, always will be considered to be natural enemies, so I will enliven the end of my paper by giving you a grotesque picture of his tormentors, written by a student who afterwards rose to high eminence in the field of scientific natural history, the late Edward Forbes.

"I followed him instinctively, and saw
A sight which sickens me to recollect.
There, in a lofty and a lengthy hall,
Around a table covered with green baize,
Sat the Examinators,—animals
Of wondrous shapes, with horns and bills, and claws
And hoofs, and asses' ears and grinding teeth
Wherewith to torment and to terrify
The luckless student who, unknowing what
A horrid fate awaited him, came there
In Sunday clothes to seek for a degree."

VESICATING INSECTS.

BY M. C. COOKE, M.A.

(Continued from page 322.)

Violet Blister Fly, *Lytta violacea*, Br. and Ratz.—Brandt and Ratzeb. ii. t. xviii. f. 10. *Lytta gigas mas*, Buchn. Repert. xxvi. t. i. f. 6.

Found in Central India.

This species is described by Brandt and Ratzeburg as follows:—

"Lytta violacea.—Head rather large, strongly rotundate-quadrate, the posterior margin nearly straight above, the lateral margins arcuate, blackish-violet, finely and somewhat uniformly punctate, shining; forehead very slightly convex; crown convex in the middle above the forehead, and above the crown a fine longitudinal impression. Antennæ filiform at the tip, nearly smooth; the first joint clavate, moderately swollen at the apex; the second joint nearly orbicular, about one-third the length of the first; the third joint cylindrical, longer than the first. The thorax above elongate-quadrate, gradually narrowed in front, and with the reflexed portion shining, smooth, with scattered impressed points; in the middle with a small furrow which unites with a triangular impression in front of the posterior margin; lateral margins slightly prominent. Scutellum triangular, very small. Breast with fine scattered black hairs arising from punctate impressions, otherwise smooth, shining, uniform blackish-violet. Legs moderate, violet, with fine black hairs. Elytra widened behind, dull blackish-violet, very finely granulate-punctate, and clothed with depressed, under a lens very conspicuous, hairs, posteriorly somewhat widened. Length 6–8‴. Breadth 2½‴."

According to the Pharmacopœia of India, this is one of the species employed there as a vesicant. It is also cited by Pereira.

Blue Blister Fly, *Lytta cærulea*, Leuckart.—Geiger's Mag. Pharm. xi. 2. 1825, p. 132.

Inhabits Bengal.

We have been unsuccessful in all attempts to meet with the portion of the magazine which contains the description of this insect in any London library. The British Museum collection does not contain any specimen referred to this name. According to Leuckart, it is a pharmaceutical species.

Large Blister Fly, *Lytta gigas*, Fabr.; dark violet-blue; breast reddish-brown.—Fabr. Sys. ii. p. 77; Brandt and Ratzeb. ii. t. xviii. f. 14, 15. *Cantharis gigas*, Oliv. Ent. iii. t. 1. f. 9. *a. b. c.*

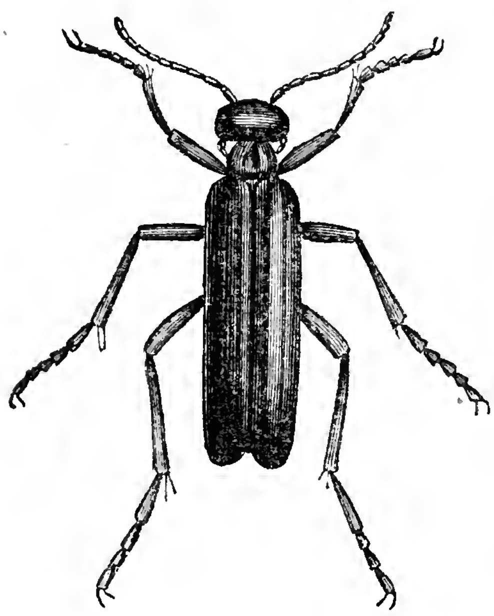

Fig. 7.—*Lytta gigas.*

Double the size of *C. vesicatoria*. Antennæ filiform, bluish-black. Body of a greenish-blue beneath, with violet reflections. Head large and inclined. Thorax attenuated anteriorly. Elytra minutely punctulate, with three elevated lines. Upper surface of the body of a bluish-black, with a large reddish-brown spot on the breast. Feet long and black.

Native of Senegal, on different plants.

According to the Pharmacopœia of India, it is found also in Central India. It is included in Pereira's 'Materia Medica' as a vesicant in use.

Sumatra Blister Fly, *Lytta ruficeps*, Illig.; black; head rufous; antennæ black; elytra obtusely acuminate.—Illig. in Wiedem. Arch. i. p. 140; Brandt and Ratzeb. ii. t. xviii. f. 7; Waterh. Trans. Ent. Soc. 1871, p. 405.

Inhabits Sumatra and Java.

Totally black, except the head, which is reddish-yellow. The clypeus is yellowish, with a transverse black band. The labrum has a notch in the front margin which is yellowish; the other parts of the mouth are more or less fuscous. The head is polished, sparingly but distinctly punctured. The thorax is subquadrate, slightly broader in front than behind, abruptly contracted and rounded in front; the fore part is slightly impressed on each side, the whole surface is thickly and distinctly punctured; the disk has a lightly-impressed longitudinal line, which runs into a deep fovea at the posterior margin. The elytra are parallel, not narrower at the base than at the apex, where they diverge, and are each rounded. The antennæ are four-fifths the length of the elytra, filiform; the second joint two-thirds the length of the first, the third a little longer than the first, the fourth two-thirds the length of the third; the remaining joints gradually increasing in length, and tapering. Legs simple. Tarsi beneath spongy, fuscous. The metasternum and abdomen clothed with short grey-black pubescence.

The male is rather more slender than the female. The antennæ are longer (very nearly as long as the elytra), the second to eighth joints furnished with long hair on the lower (or inner) side; the anterior tibiæ are furnished with long black hairs; the inner side of the femora and tibiæ clothed with golden pubescence. Length 6½–10½ lines.

Good specimens of this insect appear, in some lights, to have a reddish-brown pubescence, but a slight alteration of the position makes it appear greyish.—*C. O. W.*

This insect is stated, on the authority of Brandt and Ratzeburg, and others, to be employed as a vesicant in Asiatic countries.

(*To be continued.*)

PREPARATION OF DILUTED PHOSPHORIC ACID.

BY E. B. SHUTTLEWORTH.

The officinal process of the British Pharmacopœia for diluted phosphoric acid is a troublesome and dangerous one. The use of closed glass vessels, when operating on an explosive substance like phosphorus, is attended with considerable risk, not only to the apparatus, but the person and property of the operator. The apparatus is unnecessarily complicated, involving the employment of a retort and Liebig's condenser, while the advantage gained on the score of economy of acid is so trivial as to be practically unworthy of consideration.

A much better process is that of the United States Pharmacopœia. In this the diluted nitric acid is placed in a porcelain capsule; the phosphorus is added, and the whole covered by an inverted glass funnel of such dimensions that its rim rests on the inside of the capsule, near the surface of the liquid. A gentle heat is applied, and, if necessary, the action moderated by the addition of a little distilled water, which can be readily applied without in any way disturbing the operation. After the phosphorus has disappeared, the funnel is removed, and the concentration of the acid is effected in the same vessel by a further application of heat.

As far as the apparatus is concerned, it will readily be seen that the latter process is much more simple; the danger of explosion and fracture is almost impossible; most of the nitric acid is condensed, and trickles down the funnel into the capsule, while the manipulation is easier, and the operation can be carried to completion in the vessel in which it was commenced.

In both processes, however, the nitric acid is used in a very dilute form. According to the experience of the writer, this occasions a waste of time, and is attended with no advantage. The action of the dilute acid on the phosphorus is very feeble, and, in operating on larger quantities,—say ten pounds of phosphorus,—eight or ten days are required for the solution. The acid need not be weaker than that of sp. gr. 1·24. At this strength there is no danger of explosion, or a too rapid action. After many and cautious trials, he has now no hesitation in operating on the above-named quantity of phosphorus, with a carboy of acid of the strength named; and by so doing the solution may be effected in from fifteen to twenty hours. Nothing at all approaching to an explosion has ever occurred, but the precaution is always taken to have a quantity of distilled water near at hand, so that it can be at once added if, by the concentration of the acid, the action becomes at all violent.

In driving off the excess of nitric acid, after the phosphorus has been dissolved, a considerable degree of heat will be required, and the greatest care should be taken that the acid has become quite cool before adding the water for dilution. If this is neglected, and the water is added to the hot acid, an explosion is inevitable, owing to the rapid change of the water into the gaseous form. Indeed, it would be much less dangerous to pour water into a ladleful of melted lead.

For this, as well as all other operations in which solutions of acid or alkali are employed, the use of enamelled iron vessels must be avoided; nothing but porcelain, or at least Wedgwood, should be used. In this connection, the writer would protest against the use of enamelled vessels for any of the purposes of pharmacy in which an acid or alkali-proof material is required. He has never yet met with a vessel of this kind that was at all reliable, being either of a material readily acted on, or pierced with minute holes, exposing the underlying iron, and consequently contaminating everything with that metal. —*Canadian Pharm. Journ., August*, 1871.

THE PRINCIPLES OF GAS ILLUMINATION.

(*Continued from page* 326.)

The draught, or in-flow of air upon a flame of a given size depends greatly upon *the velocity with which the gas issues from the burner*. With argands there is a special means of regulating the air-supply (viz. the chimney); but with all burners, whether argands or naked burners, the velocity with which the gas issues has an important influence upon the air-supply; and in the case of naked burners (batwings and fishtails) this velocity of issue is, speaking roundly, the *sole* regulator of the air-supply.

Every flame, by its heat, produces an upward current which draws in upon its sides the surrounding air; but (the heat of the flame remaining the same) the greater the ascending velocity of the gas the greater is the draught made by the flame, and the more air is drawn in upon it. A gas-flame rises into the air like a rapid stream entering or passing through a quiescent pool,—producing eddies, setting in motion and drawing in upon its side, in currents, the surrounding water. The more rapid the entering stream the greater the currents and eddies, the watery draughts, so to speak, which it makes in the pool; and these inflowing currents not only play upon the sides, but tend to mingle with the stream itself. Thus there are two constant and unavoidable causes of draught or air-supply to a gas-flame. Firstly, the ascending power or velocity of issue which gas possesses, even when unignited, owing to its being lighter than the air; secondly, and chiefly, the fact that it is a *flame*, a source of heat, producing a partial vacuum which the surrounding air flows in to fill up.

But with the gas-flame there is a special source of disturbance, and that is the pressure under which it issues from the burner. The increased velocity thus given to the gas augments the draught upon the flame to an extent that is not counterbalanced by the quantity of gas consumed, the discharge of gas from the burner increasing only in the ratio of the square root of the pressure. In this way the gas-flame is brought into contact with more air than it is able to bear without loss of illuminating power. Other points to be observed are that the supply of gas to all parts of the flame should be equal, and in an even and steady current, without any twist.

The investigation as to the effect of the air-supply on the illuminating power yielded some interesting results. The size or height of gas-flames is notably diminished by increasing the draught or air supply. With an argand burner this draught can be regulated by means of the chimney, and the apertures at the bottom of the burner. Take Sugg's London Argand No. 1, consuming five feet an hour of sixteen-candle gas. Without the chimney, we get a waving yellow flame about eight inches in height, and ocasionally smoking. The gas, in fact, extends itself upwards until, by the size of the flame, it comes in contact with the air to the requisite extent to produce entire, or almost entire, combustion. Put on a chimney, of the most suitable kind for this quantity and quality of gas, and the height of the flame is at once *reduced by one-half*, nevertheless the illuminating power of the flame is *increased by one-half!* If, as is held by some, a slow rate of combustion were the best means of developing the illuminating power of gas, the tall flame which rises from an argand without the chimney ought to give the maximum of light. But the fact is otherwise; for, when the chimney is placed on the burner, and the combustion of the gas proceeds much more rapidly than before, the illuminating power of the flame is largely increased. The explanation of this evidently is, that the brilliancy of the flame, owing to the intensity of the combustion, is so much increased as to far more than compensate the diminution in the size of the flame. Instead of a tall dull yellow flame about eight inches in height, we have a flame less than four inches high of brilliant white, which gives much more light. The cause of the shortening of the flame is the more rapid combustion of the gas, owing to the increased draught or air-supply produced by the use of the chimney. Hence it is manifest that rapidity of combustion, so far from occasioning a loss of light, may—and in this case does—greatly increase the illuminating power of burning gas. But if we still further increase the draught by using taller chimneys, we obtain opposite results; a further diminution occurs in the size of the flame, which is not compensated by the increase of its brilliancy. The explanation of these opposite results throws an important light upon the real cause of the startling diversity of illuminating power obtained from gas when consumed in different burners and under different conditions.

As is well known, the Bunsen burner, in which air is made to mingle with the gas before the point of ignition, gives a pale blue or violet flame which is almost lightless. But in proportion as the mingling of the air with the gas is diminished, by closing some of the holes in the stem of the burner, the flame becomes white and light-giving. A commingling of air with gas enormously diminishes, and may entirely destroy, the light-giving power of gas. But in what manner is this effect produced?

First, take the case of a Bunsen burner. The air which mingles with the gas before the point of ignition, and which (so to speak) is burnt along with it, contains 73 per cent. of nitrogen, which is a non-luminous, indeed, incombustible body; and the result is, that the gas-flame being diluted with this incombustible body, cannot possibly attain the temperature which it would possess if burnt by itself,—part of the heat of the burning gas being taken away in heating the intermingled nitrogen. But oxygen when in excess plays a similar part; for that portion of the oxygen of the air which is not needed to produce the combustion of the gas cannot burn, and simply dilutes the gas with a non-luminous body, which abstracts a portion of the heat generated by the burning gas. Hence, the flame of a Bunsen burner is, or may be, diluted by two non-luminous bodies—namely, by the whole of the nitrogen of the air admitted into the stem of the burner, and also by that portion of the oxygen of the air which is not needed to produce combustion of the gas, yet which, under the influence of "pressure" and draught, may commingle with the flame, not only of the Bunsen, but of every kind of burner. The consequence is, that the two non-luminous (and in this case incombustible) diluents—the nitrogen and the excess of oxygen—mingling in the flame, are heated by abstracting heat from the burning gas; so that it seems obvious that the gas-flame cannot acquire the high temperature which it would otherwise possess.

The flame of the Bunsen burner has hitherto been regarded as the hottest of all gas-flames. But this, the referees say, is not correct: for, in repeated experiments, a platinum wire has melted in the blue part of batwing and fishtail flames, whereas the same wire did not melt in any part of the Bunsen flame. The special advantage of the Bunsen burner is that it gives a smokeless flame, and also that, by the intermixture of air, the gas is consumed within the smallest possible space; and *cæteris paribus*, the smaller the flame in which a given quantity of gas is consumed, the hotter will be the flame, more gas being burnt in the same space. At the same time, as already said, it seems obvious that owing to the intermixture of air with the gas, the flame of the Bunsen burner cannot possess as high a temperature as would be the case if an equal quantity of gas could be burnt pure in an equally small flame. The Bunsen burner consumes the gas in the smallest possible space, thereby concentrating the heat developed by the burning gas; but, on the other hand, the intermixture of air appears in some respects to alter unfavourably the conditions of combustion.

In all flames like those of gas, of a candle, or a match of wood or paper, a portion of the flame is blue. And this blue portion is always at the bottom of the flame. Any one who examines a burning candle will also observe that there is a peculiar band of very bright blue forming the outermost rim of this lower part of the flame. And if a burning spill of wood or a paper-match be examined, it will be seen that this bright-blue part of the flame is strongest (not only at the bottom but also) at the point nearest to the unignited part of the match; *i. e.* at the point where the substance first takes fire. Doubtless the blue and almost lightless part of all flames is produced from the combustion of hydrogen (which ignites more quickly than the carbon), and the bright-blue rim edging this under part of the flame is due to carbonic oxide. By repeated experiments, also, it was found that the blue part contains within it the hottest point of the flame.

The upper white portion of gas-flames may be said, speaking roundly, to be the only portion of the flame which gives light. How is it composed? The fact of gas-flames smoking shows that some portion of gas may pass through the whole of the flame without being perfectly consumed; and the upper portion of the flame manifestly consists of gaseous atoms which have passed through the lower blue portion of the flame unignited, or else which acquire an increased temperature as they ascend. As the illuminating power of gas is due to the incandescence of carbon, it appears evident that, while the free hydrogen burns in the under part of the flame, the hydrocarbons burn chiefly in the upper part: and the intensity of their combustion is aided by the great heat generated by what may be called the furnace of hydrogen below.

There is a striking difference of appearance between gas-flames and what may be called *natural* flames; *e. g.* of burning coal or of a candle. The latter flames are more solid,—they have less blue and more white than gas-flames. This is owing, in the first place, to there being more carbon in these natural flames than in gas. Take the case of a candle, or of the flames from coal burning in a grate. In both of these cases the whole of the light-giving vapours are consumed in the flame; whereas in gas, a large portion of the light-giving vapours of coal are lost, being withdrawn by the condensing apparatus in the gas-works. It is only the *permanent* vapours of coal that constitute gas,—*i. e.*, one which does not condense under ordinary circumstances. But a large proportion of the illuminating elements of burning substances condense readily, and therefore cannot be used as gas. In an oil-lamp or a candle, the *whole* of the illuminating vapours of the oil and the tallow go to form the flame; but in gas a large portion of the illuminating constituents of the coal is withdrawn by condensation in the form of tar, naphtha, etc.; for, as these vapours condense at the ordinary temperature of the air, they would, if left in the gas, become solids as soon as they cooled, and thereby choke the pipes. This is one cause of the difference between natural flames and gas-flames: the former are produced by the whole illuminating vapours of the burning substances, whereas in gas all the non-permanent vapours are withdrawn, and the light is due only to the permanent vapours yielded by the coal.

The effect of the temperature of gas on its illuminating power, and how it affects the development of that illuminating power in burners, is a question that has been little investigated; but, in the main, it has been held that the warmer the gas supplied to the burner, the greater will be the amount of light obtained compared to the quantity of gas consumed. Some experiments on this subject were made last year, in the laboratory of the University of Munich, in which the burner was attached to a U-tube, immersed alternately in a freezing mixture and in a liquid at a high temperature.

(*To be continued.*)

NITRITE OF AMYL.

Some time since, we gave an abstract of a paper from the *Medical Times and Gazette* which contains some particulars as to the therapeutic uses of the new remedy, nitrite of amyl.* In the *Practitioner* for October, Dr. Talfourd Jones, Physician to the Brecknock County and Borough General Infirmary, furnishes some other interesting information concerning its mode of application and its effect in some cases in which he has used it with considerable success.

Dr. Jones states that he has now given it experimentally to some fifty friends and patients, and he has found that its inhalation invariably causes increased frequency of the cardiac pulsation, accompanied by flushing of the face, warmth of head, face and neck, and perspiration—the warmth and perspiration often being general. A pulse of twenty in the quarter-minute will often rise in ten or fifteen seconds to forty. It sometimes causes a little breathlessness, or now and then giddiness, and in some a feeling of intoxication.

It may be administered by inhalation, by the mouth or by subcutaneous injection. Dr. Jones considers the best and safest way to be by inhalation. He usually pours five drops upon a piece of lint the size of a crown-piece or larger, and holds it close to the nostrils for ten or twenty seconds, or until an acceleration of the pulse is felt or the face begins to redden. Another plan is to drop the nitrite on to a pocket-handkerchief, and then hold it to the nose just like chloroform, or it may be inhaled directly from the bottle. He has never seen any bad effect result from its use, but he considers it to be an important point that it should be administered with great judgment and caution to aged persons or those who are the subjects of arterial degeneration.

Dr. Jones considers that it acts by relaxing muscular spasm, and he mentions several cases of spasmodic asthma, angina pectoris, colic, etc., in which it gave immediate relief. In the case of a young man suffering from an-

* Pharm. Journ. 3rd Ser. Vol. I. p. 209.

gina pectoris, it is stated that the patient carries the drug about with him and smells directly from the bottle whenever he feels an attack coming on. Since the 26th of last January this person has used more than thirty ounces of the nitrite, for which large quantity he accounts in the following way. He pours about half a teaspoonful into a small stoppered bottle, which he constantly keeps in his pocket. After he has used it for one or two attacks he finds that it gets "flat," and fails to produce such good results as fresh amyl; so he throws it away and replenishes from his stock bottle. This result is corroborated by Dr. Jones.

THE PREPARATION AND PROPERTIES OF THE VARIOUS KINDS OF CHINESE TEAS.

BY F. PORTER SMITH, M.B. LOND.

It is proposed to review the various stages and processes of growth and manufacture of tea, as supplied by China to the civilized world, with reference to the medicinal and dietetic properties of the various forms of this "necessary of life." It is to the credit of the Celestials that, whilst they do not live under the strict rule of Islam, they have elected to confine themselves chiefly to the use of a drink which has commended itself to all sorts and conditions of men. In no other country is such a store of wealth drawn from the very leaves of trees as in China, where the mulberry-leaf furnishes silk for clothing, and the tea-leaf material for satisfying hunger and thirst.

The tea-plant of China, the *Thea Cantoniensis* or *Thea viridis* of botanists, is not the same as that used in very remote periods by the people of the classical period. They probably used the leaf of the chicory, as well as those of other plants still used in various parts of the country, such as the willow, the holly, the *Sageretia theezans*, and other plants.

Since the seventh century of the Christian era the growth of the tea-shrub has been sufficiently extensive to invite taxation by the Emperor, though to a much less extent than cereal crops, the chief dependence of the people of the "Middle Kingdom," the name by which China is known to its own people. The tea-shrub is met with in Hupeh province as a small, stunted evergreen bush, varying from one to three feet in height, and covered with a precarious growth of young shoots, bearing shining, ovate-pointed and irregularly serrated leaves. It is grown on the hill-sides or terraces of such districts as have a red and rapidly disintegrating sandstone soil, where rice could not well be raised, from the difficulty of irrigation. The shrubs are renewed from young seedlings, after some ten years or so, according to the enterprise of the peasant grower. Formerly the bushes were renewed every five years, but the extraordinary and insatiable demand for tea has led to the exhaustion of the plants, as anything in the shape of tea is bought by the speculative and indiscreet foreign trader. The seeds are often abortive, from the damage done to the tree by the remorseless stripping of the leaves. The seeds require some peculiar treatment, such as the soaking in a prepared liquid, or in an artificial mould made of exhausted oilcake. Several seeds are placed together to ensure the growth of a single seedling. The seeds yield a fixed oil, which is said to never turn rancid. The tea oil known to foreign residents in China is the product of the seeds of the *Camellia oleifera*, a plant called by the same name (*Ch'a*) as the tea-shrub. The various kinds of tea—namely, green, black, red, and brick tea—are all produced by the same kind of shrub, which shows some slight tendency to variation in some such simple characteristics as the length of the leaf, etc. The leaves are picked at three or four periods of the year, commencing with the latter part of April. The bushes are finally clipped to make some of the brick tea, and to encourage the growth of young shoots in the coming spring. The raw leaves are dried in the sun by spreading on mats, and the shrivelled product pressed and rolled by men, who stand in tubs, kneading the leaves into a ball with their naked feet. This operation gives the twist to the leaf, and removes superfluous watery juices. The tea is seldom dried by fire by the small tea-growers, unless the weather be wet and the tea liable to mould from the want of sunheat. It is stored in bags long enough to collect a quantity, and is then "fired" by placing it in thinnish layers on the convex diaphragm of a large hopper or basket, shaped like a dice-box, with both ends open, which is put over a charcoal fire. The leaf is exposed to this heat (which never exceeds 212°, and is moderated by placing a thick layer of wood ashes over the fire) for about two hours, being stirred up several times, so as to heat the whole of it gradually and thoroughly. Processes of sifting, winnowing, mixing, and picking follow, and a final "firing," to get rid of moisture acquired during the manufacture, fits it for packing in chests. The stalks are usually rejected, as foreign tea-buyers do not like them. They contain all the properties of the leaf, and are largely consumed by the Chinese. The tea ought to undergo no change in the chests, which are carefully closed by soldering. The flowers of the *Aglaia odorata*, the *Jasminum Sambac*, the *Chloranthus*, and perhaps other plants, such as the *Gardenia*, are used to scent the tea. Dried leaves of the *Salix alba* are used to adulterate tea sometimes, but in the interior of the country such practices are commendably rare. Black tea forms the bulk of the produce, and is preferred by the Chinese for ordinary drinking. Red tea is made from the same kind of tea-shrub, and is of a brownish-black, rather than a red, colour. The infusion is certainly of a deep-red colour, and this may be the origin of the name *Hung-ch'a*, or "red tea," a name given to it by the Chinese. Green tea is made in Hupeh to some extent by picking at the very beginning of the season the fine hairy summits of the youngest branches of the shrubs. Brick tea is made from the clippings of the tea-bushes, the dust of black tea, and from any other description of leaf. Odd stories about blood and other substances being mixed with the tea-leaf and dust are perfectly unfounded. There are "large green bricks" of the coarsest sort, "small green bricks" made of a better kind of tea-leaf, and "small black bricks" made from good tea-dust. The shape of the tea which is used as a means of barter by the Mongol tribes is more like that of a tile than a brick. In making brick tea the leaves and dust are steamed, pressed in moulds of a uniform size, and carefully dried without access of the sun, or any other direct source of heat.

This tea goes to the Siberian, Buriat, Tungous, Kirghis, and Mongol tribes, who chop it up with salt and butter, or koumiss, after exhaustion of the leaf in the ordinary way. The people of Thibet wisely add a little carbonate of soda to the water used in brewing their tea from slices of the bricks.

If two or three leaves be picked from a tea-shrub and chewed in the mouth, very little in the way of marked impression is made upon the sense of taste. A grassy, slightly bitter, but scarcely astringent flavour is brought out in the mouth. The peasants picking the leaf or passing through the tea shrubberies are seldom seen to gather the leaf and partake of it, as schoolboys do of bramble leaves in English lanes.

Prepared tea-leaf is, in fact, a very different thing from the raw, growing leaf of the shrub. Chinese tea consumed in the country, and prepared by a single "firing," after drying in the sun, is also a very different article from the Congou tea prepared for the English market. On this account, Chinese statements and experience are of no great use in determining the effects of tea as consumed in western countries. Russian tea, which undergoes no special preparation for the short overland journey which it has to make, is more like the Chinese native tea in flavour. Foreign new tea—that is, tea prepared and still in China—is a very different article from the tea when placed in the teapots of English villagers, after being conveyed in an iron ship through the tropics, in large quantities of some ninety or more pounds weight. Tea is described in the Chinese pharmacology as cooling, peptic, exhilarating, rousing, both laxative and astringent, diuretic, emmenagogue, and in large concentrated doses as an emetic. It is used as a wash for sore eyes, ulcers, and wounds of all kinds. It is understood by Chinese physicians that the excessive use of tea renders people thin, anæmic, and weak-sighted.

Tea is taken by Chinese scholars and labourers to stave off the cravings of hunger until a convenient season arrives. Much of the so-called tea taken by the common people in China is nothing but very warm water. Hot water is often taken by them in large quantities when threatened with colds, fevers, and other acute or chronic diseases, apart from considerations of economy. They regard it as antidotal, corrective, solvent, demulcent, diluent, lenitive, stimulant, deobstruent, diaphoretic, diuretic, and lithontriptic in its effects. Such a dose is much more sensible than the inevitable "sixpenn'orth of the best French brandy" which the English rustic gulps down in the emergency of pain or some other symptom. Experience has taught the Chinese that weak tea is much better than cold and impure drinking-water. They are exceedingly particular as to the water used in tea-making. They prefer the comparatively soft water of their large muddy rivers, so often swollen by rain and the melting of snow. They object to tea made from lake water, as they consider it unwholesome and having a tendency to render the mind dull and slow.

(*To be continued.*)

THE CARBON CLOSET SYSTEM.*

By Edward C. C. Stanford, F.C.S.

This method of excretal removal is a modification of the Earth Closet System, in which some form of carbon is substituted for earth. The main objections to the application of the earth closet to large towns are,—the large amount of earth required, and the difficulty in obtaining the necessary supply.

By the use of charcoal the amount of deodorizer required is reduced to less than a fourth as compared with earth, and by carbonizing the manure removed, a constant supply is secured.

It is urged that the sewage difficulty may be enormously lessened, if not completely done away with, by treating the excreta of towns as we treat the ashes, removing each separately, and keeping all out of the public sewers. The quantity per head to be removed per annum may be fairly estimated at eight cwt., of which about seven cwt. represents urine alone. The amount of carbon required to perfectly absorb the whole of this quantity is less than eight cwt., so that in an ordinary household of ten persons, the total annual quantity required cannot exceed four tons, and the whole removal will probably, owing to the drying action of the charcoal, be about five to six tons.

The same household would use about twenty tons of coals, and probably send away four tons of ashes; much of this coal would have to be carried into the bedrooms. The charcoal method is so perfectly inoffensive that commodes may be placed, if desired, in every bedroom, without the least fear of odour or of danger to health. In this respect no water-closet can compete with it. The carbon closets are also arranged to be quite automatic, and require no attendance from within. The charcoal is introduced through an aperture in the roof into a reservoir at the top of the house; a closet on each floor draws on this source of supply, and the whole of the product is discharged in a dry deodorized state into a cemented vault in the basement story of the house.

The chamber urine is emptied into a small earthenware urinal on each floor, and from this a lead pipe conducts it direct to the vault, where it is absorbed by the charcoal from the closets.

The reservoir need only be replenished, and the vault emptied, once a year. The manure removed can scarcely be distinguished from cinders by an ordinary observer, and it is equally inoffensive.

The value of the material removed is about 1*s.* per cwt., or 8*s.* per head per annum. The household has the charcoal and the material removed without cost. A Company called "The Nitro-Carbon Manure Company (Limited)" has been formed in Glasgow (Office, 154, West Regent Street), to collect and treat the manure, and supply the charcoal. The manure is removed to the works and carbonized in revolving retorts driven by a steam-engine; the whole of the material is then converted into charcoal: and gas liquor, tar, and gas are distilled off and collected in suitable condensers. The charcoal increases at each reburning by the amount yielded by the excreta itself, a portion is returned to go on charging the closets, and the balance is available as manure. The charcoal produced is an animal charcoal resembling that made from bones, and contains all the phosphate and potash and soda salts of the excreta. The gas liquor furnishes ammonia derived from the animal portion of the food, and acetic acid derived from the vegetable portion. The tar and gas are used for heating purposes at the works. A new closet has been specially patented for the use of charcoal by Messrs. Pollock and Pollock, of Leeds, and may be obtained of the Carbon Closet Company, 46, Haymount Street, Leeds. This closet, which is figured in the *Engineer* of August 5th, 1871, and which may be seen at 154, West Regent Street, is expressly constructed for the use of powdered charcoal; it delivers a minimum but accurately measured quantity, and places it exactly where it is required. When these come more into use, the amount of charcoal used will be much less than that alluded to in this notice, the quantity will, it is expected, be nearly one-half the amount stated.

For large public works the carbon closet is invaluable; it is the only method of removal which the clumsiest of workmen cannot make offensive. The straw and waste with which the pipes of all workmen's water-closets are so constantly stopped do no harm here, and are all converted into charcoal on reburning. The principal shipbuilders on the Clyde are so impressed with these advantages, that they are pulling down large and expensive erections for water-closets to substitute carbon closets. Urinals on this system are constructed simply of vertical slabs six feet high and two feet wide, set in the form of a W on a large stone flag over a tank of charcoal; an occasional wash with a mop dipped in dilute hydrochloric acid, will make the slabs instantly and perfectly clean. The acid is cheap, and it cannot injure either the urinal or the charcoal. The process will be found fully described in the following papers by the same author:—

"A Chemist's View of the Sewage Question."—*Chemical News*, 1869.

"A Chemical Method of Treating the Excreta of Towns."—*Chemical News*, 1869.

"The Sewage Question."—*Chemical News*, 1871.

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* Abstract of a Paper read before the Mechanical Section of the British Association. Edinburgh, 1871.

The Pharmaceutical Journal.

SATURDAY, NOVEMBER 11, 1871.

Communications for this Journal, and books for review, etc., should be addressed to the Editor, 17, *Bloomsbury Square.*
Instructions from Members and Associates respecting the transmission of the Journal should be sent to Elias Bremridge, *Secretary,* 17, *Bloomsbury Square, W.C.*
Advertisements to Messrs. Churchill, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

APPRENTICESHIP AND THE PRELIMINARY EXAMINATION.

In the discussion concerning the obligations of the Pharmaceutical Society in respect to provincial education, which is now being carried on with fresh vigour in our columns, one point has been urged that is worthy of the serious consideration of all pharmaceutists who contemplate taking apprentices, namely, that on receiving apprentices they should make it an indispensable condition that the pupils should have previously passed the Preliminary Examination.

At the meeting of the British Pharmaceutical Conference at Liverpool in 1870, the Registrar of the Pharmaceutical Society stated as the result of his experience that most of the failures to pass the Minor Examination arose from deficient elementary education, and he recommended that masters should require every youth to pass the Preliminary Examination before he commenced his apprenticeship. This view was concurred in by most of the speakers; and as the occasion was one on which the subject of the facilities for pharmaceutical education in the provinces was brought forward for discussion at the special invitation of the Council of the Pharmaceutical Society, we think the opinions then expressed should have great influence. The proposition has been advocated at various times in the columns of this Journal, and it was also the basis of a paper on the apprenticeship question read at the Edinburgh Conference by Mr. S. R. Atkins, as pointed out by that gentleman in his letter this week.

It is evident that pharmaceutists have no special obligations towards securing the education of those with whom they have not yet entered into business relations. There is a tendency in some of our correspondents to hold the body to some extent responsible for the large proportion of failures at the Preliminary Examinations; and reflections are made upon certain towns that are supposed to have failed in their duties. But this is only true to a limited extent,—to the extent of the proportion of candidates who have entered the business before passing their examination. The fact that thirty-seven per cent. of candidates failed to pass a test that might justly be demanded from a lad who had received a fair education may be, and undoubtedly is, an indication of the great absence of sound teaching in this country, but we do not see that it involves any reflections upon pharmaceutists except as members of the commonwealth.

Were this policy generally followed by employers throughout the country, not only would the work to be done in providing means for education be greatly limited, but the supply of men who, supposing them to have had ordinary opportunities, have proved their unwillingness or incapacity to learn, would be stopped at its source, and a more successful result secured. Although it is pleasant to remember the unselfish and disinterested nature of all the educational efforts of the Pharmaceutical Society since its foundation, it will not be out of place to remind employers that apprentices secured under the conditions suggested are more likely to turn out valuable servants than those from whom no such examination is demanded.

We take this opportunity of stating that there is no desire on the part of the Council of the Pharmaceutical Society, in the case of the Preliminary Examination, to re-examine a candidate who has already proved his qualifications. Certificates of having passed the Local Examination of the Universities of Oxford, Cambridge or Durham, the examination of the College of Preceptors, or that of any legally constituted examining body previously approved by the Council, provided Latin and arithmetic be included in the subjects, are accepted in lieu of this examination.

A fortnight since we called attention to a notice of motion by Mr. Gay, at the meeting of the Council of the Royal College of Surgeons. This week we are informed by a correspondent that, at a recent Preliminary Examination of medical students in Glasgow, only twenty-eight passed out of fifty-six; and, moreover, that only eight of the whole number went up then for the first time. We mention these facts, not as matters for congratulation, but as showing that the Pharmaceutical Society is not singular in its experience.

SIR ROBERT CHRISTISON, BART.

Rarely has a better merited compliment been bestowed than that of the baronetcy just conferred upon this distinguished pharmaceutist and physician. Our readers are so familiar with the peculiar services rendered to toxicology and materia medica by Sir Robert Christison that we may absolve ourselves from any detailed reference to them here. But as a citizen, and above all as an academic functionary, Sir Robert has claims to respect and gratitude which ought to be known beyond the immediate locality in which they were earned.

Probably there is no man in Edinburgh who has done more for the reputation of the city and the efficiency of the University than he. The high professional tone he has kept up in the Senatus has been paralleled by the enlightened and active public spirit he has manifested in the promotion of municipal interest. If there is anything that can add to the gratification with which we announce the honour just bestowed upon Sir ROBERT, it is the reflection that he has received it, not at the conclusion of his career, but at a time when he is still full of that intellectual and physical energy which may be expected in the future to equal, if not excel, its achievements in the past.

PHARMACEUTICAL GRIEVANCES IN THE UNITED STATES.

ON several occasions during the last twelve months we have recorded attempts, more or less successful, that have been made in various States of the American Union to obtain the enactment of laws for the regulation of the practice of pharmacy. Doubtless part of the legislation proposed has been very crude, but the way in which the "Drug Clerk Bill," recently passed by the legislature of New York,* is being carried out, will probably cause a temporary cessation in some of the efforts to obtain State recognition, and lead to a careful revisal of proposed Bills previous to bringing them before the respective legislatures.

One serious ground of objection to the New York Act, by the druggists of that city, is, that the examining board have decided not to admit the diplomas of American or foreign schools of pharmacy as evidence of qualification, and that all candidates shall undergo an examination in chemistry, poisons and their antidotes, practical pharmacy, officinal botany, the adulteration of drugs and prescriptions. Another objection is, to the fee of thirty dollars demanded, which is roundly denounced as extortionate, and an opinion has been expressed by some New York druggists that the law was concocted and forced upon them, not with the view of benefiting society, but to afford emolument to a few political partisans. Consequently an "Apothecaries' Union" has been formed, having for its object to test whether a law which ignores diplomas granted by the New York and other chartered colleges, and in effect "legislates men out of the business they have followed for years under solemn legal sanctions, charters, and guarantees," is constitutional.

In England, while most people rejoice when they hear of an increase in the revenue, the collector of revenue is certainly not very popular, and few persons covet his frequent interference with their business. Thus pharmacists in this country will be able to sympathize with their American brethren, who seem just now to attract more than a fair share of his attention. We learn from the *American Journal of Pharmacy* that, until recently, imported perfumery in small packages, as originally put up by the makers, could be sold unstamped, but it has now been notified that it may only be so sold while in the original or unbroken packages, as entered at the Custom House. This regulation will, in practice, nearly abolish the sale of small original packages, as each bottle will have to be stamped before sale by the importer of the larger parcel.

Again, a few months since the revenue assessors visited a number of pharmacists in Philadelphia, and induced the proprietors to stamp their shop-bottles, from which perfumery and toilet articles were retailed, equivalent to the stamp duty of the retail value of their contents. The revenue commissioner, however, has since decided that the law does not authorize this practice, but that it "requires the stamp to be affixed to the bottle, or other enclosure, in which the article is sold or delivered, even though the bottle or enclosure may be furnished by the purchaser." As the law also requires perfumery to be stamped in proportion to the full retail value of the vessel and its contents, a rather ludicrous result would follow the presentation by a luxurious customer of a valuable fancy bottle to be filled with a few cents' worth of perfume.

* Vol. i. pp. 773, 890.

WE are requested by the REGISTRAR to state that the letter from "SPES," which appeared in our last issue, and which referred to the number of failures at certain places in the last Preliminary Examination, contains some inaccuracies. "SPES" appears to have fallen into the error of supposing that the published "List of *Towns at which Examinations were held*, with the Numbers of Candidates annexed" (p. 329), also represented the places at which the *candidates resided*, and, comparing it with the list of names and residences of those who passed (p. 328), he thus arrived at conclusions which are incorrect. For instance, at Swansea, five candidates presented themselves for examination, none of whom resided in that town, although it happened to be the nearest centre for them. All of these passed, but as their addresses in the list do not appear as "Swansea," "SPES" gives them as failures. We append "SPES'" list corrected by the REGISTRAR:—

	Candidates examined.	Candidates passed.	Candidates failed.
London	30	17	13
Manchester	9	6	3
Birmingham	2	0	2
Derby	4	4	0
Peterborough	4	0	4
Swansea	5	5	0
Taunton	4	1	3
Aberdare	3	2	1
Aberdeen	5	2	3
Carmarthen	3	1	2
Chester	3	0	3
Wolverhampton	2	0	2
	74	38	36

AT the recent meeting of the American Pharmaceutical Association, the following gentlemen were elected Honorary Members:—Professors REDWOOD and ATTFIELD, of London; HENRY B. BRADY, Esq., of Newcastle-on-Tyne; M. LÉON SOUBEIRAN, of Sèvres; MM. AUGUSTIN DELONDRE and A. CHEVALLIER, of Paris; Professor A. DUFLOS, of Breslau; Professor H. LUDWIG, of Jena; and Herr ANTON V. WALDHEIM, of Vienna.

Transactions of the Pharmaceutical Society.

The following donation has been presented to the Museum:—a finely crystallized specimen of Bromide of Potassium, by Messrs. Hopkin and Williams.

Provincial Transactions.

THE NORTHAMPTON CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

A Meeting was convened by the assistants of this town on the 26th ult., for the purpose of forming the above association, the object being for mutual improvement and advancement in pharmaceutical knowledge of themselves and the apprentices. Mr. MASTERS was called to the chair, and, after a few preliminary remarks on some of the advantages hoped to be gained, introduced E. F. Law, Esq., J.P. (a gentleman well known throughout the town for his scientific knowledge), who attended by special request of the preliminary committee, and gave an instructive address, which was well calculated, from the variety of interesting points in science touched upon, to stimulate and encourage those present in the diligent pursuit of knowledge, and the determination to overcome all obstacles in their path. The speaker was very earnest in pointing out the mistake persons made in attempting to overthrow religion by the aid of science, and impressing his hearers with the importance of not being content to know what nature's laws were, but why they were. As a beautiful example of the wisdom and prevision of Providence, he mentioned the peculiarity of water expanding after it has passed a certain degree of cold; and held that Professor Tyndall, in his treatise on heat, was incorrect in stating that an iron bottle was broken by the same rule when molten bismuth was poured in and allowed to cool; he contended that the subjects were not analogous. The speaker concluded his eloquent and appropriate address by wishing every success to the association.

A vote of thanks having been proposed to Mr. Law by Mr. HESTER, and seconded by Mr. LESTER, was carried with acclamation. The meeting was adjourned until Monday, Oct. 30th.

On the latter occasion the following officers were elected for the twelve months, commencing Oct. 1st last:—Mr. Masters, President; Mr. Tigar, Secretary and Treasurer; and a Committee consisting of four assistants and one apprentice was then formed, namely, the President (Mr. Masters), Messrs. Tigar, Druce and Stedman as the former, and Mr. Cross as the latter. They were instructed to prepare a code of rules, and arrange the evenings, etc., for the holding of classes or other meetings most suitable to the general assistance and advancement of members preparing for the several examinations.

At a subsequent meeting of the Committee a code of rules was agreed upon, and a subscription fixed at five shillings annually. It was determined to hold classes on Monday, Wednesday and Thursday evenings. On Monday, from half-past eight to half-past nine, chemistry (following Attfield's 'Manual of Chemistry'), taken by Mr. Tigar; from half-past nine to half-past ten, pharmacy, etc., by Messrs. Tutton and Lester. On Wednesdays, the same time, the first hour, botany, by Mr. Druce; the second hour, materia medica, by Mr. Ashby. On Thursdays, an hour will be given by a competent person to those preparing for the Preliminary examination. The President, by virtue of his office, to superintend all the above classes.

Through the kindness of one of the masters, a room in his own establishment is being prepared for the use of the association at his own cost. This was not the only kind offer of a room, but, being the first, was accepted. As soon as the room is finished, which will be in about ten days, the above classes will at once commence.

GLASGOW CHEMISTS AND DRUGGISTS' ASSOCIATION.

The usual fortnightly Meeting of this Association was held in the West Hall, Anderson's University, 204, George Street, on Wednesday evening, 1st inst.; Mr. THOMAS DAVISON, President, presiding. The meeting having been duly constituted, the following donations were announced, viz.:—Annual Subscriptions of one guinea from Messrs. W. and R. Hatrick and Company, and 10*s*. from Dr. A. M. Robertson. A letter was read from Daniel Frazer, Esq., offering five pounds to start a fund for the purpose of establishing a museum and library, which was left to the Council to consider and report upon. The PHARMACEUTICAL JOURNAL and *Chemists and Druggists' Advocate* were also laid on the table, and specimens of a poison bottle from Messrs. Hargreaves and Co., of Manchester.

D. Campbell Black, Esq., M.D., and E. C. C. Stanford, Esq., Ph.C., F.C.S., were elected honorary members, and Messrs. Townshend, M'Laren, M'Leod, John Young, A. M'Kay, D. J. Strang and Brady, were elected members.

"The best means of promoting the Education of the Pharmaceutical Student in Glasgow" was then discussed; the PRESIDENT opening the discussion by referring to the paper by Mr. Edward Smith, lately published in the PHARMACEUTICAL JOURNAL, on "Provincial Education." He quite agreed with the first two propositions, that all apprentices should pass their Preliminary examination before they became connected with the business, and thought that it could hardly be expected that they should provide classes for students who had passed their Minor; those he thought were in a position to help themselves. He then referred to some of the necessities of Glasgow, urging those requiring education to encourage the efforts already being put forward by the Association, and he had no doubt all would be benefited.

Mr. PATERSON followed, and after speaking in high terms of the address delivered on the previous night by Mr. Stanford, he spoke of early-closing, expressing it as his opinion, that until they had a more general shortening of the hours of labour, but little progress could be made in education.

Mr. KINNINMONT then addressed the meeting. He said it would no doubt ultimately be the case that apprentices would be required to pass the Preliminary before connecting themselves with the business, but they were in a transition state at present, and even those classes on chemistry and botany got up by the Association were merely a step to raise them to their proper position. He thought the time must come when it will be part of the agreement between employer and *employé* that time shall be allowed to attend classes, not supplementary classes in the evening, however, but the regular University classes during the day. He thought chemistry, botany, materia medica, and the toxicology of medical jurisprudence, should be the classes taken up by pharmaceutical students. As regards the classical education, there were so many opportunities in the city of getting it independent of the Association, he did not think it would be any advantage for the Association to inaugurate such.

Mr. HOWIE, of Edinburgh, was then called upon, and made a few remarks with regard to opportunities for pharmaceutical education in that city. He believed that some of the firms there had some such arrangement entered into as that referred to by Mr. Kinninmont, viz. students attending the regular University classes during the day, and that in these cases the University authorities had reduced the fee about one-third to students in pharmacy.

The discussion was continued by the SECRETARY, Messrs. BRODIE, CLARK, YOUNG, etc., at the close of which it was left to the Council to consider the propriety of drawing up a memorial for presentation to the London Council with regard to the question of grants of money from the Society to Provincial Associations for educational purposes.

Mr. J. L. M'Millan, seconded by Mr. Clark, moved that the name of the Association be altered to the "Glasgow Pharmaceutical Association."

Mr. Paterson moved the previous question, which was seconded by Mr. Brodie, and carried by a large majority.

Mr. Fenwick moved "That the Council take steps to obtain a grant of money from the Council of the Pharmaceutical Society," which was seconded by Mr. M'Millan.

Mr. Fairlie objected to the proposal, for several reasons. First, the largest sum of money that had yet been given was £10, a sum which would be of little service to them for the purpose to which they would be bound to apply it to. Secondly, their own resources had not yet been exhausted. Third, he believed that there was a possibility of some new arrangement being entered into by the London Council with respect to Provincial Associations; and for his own part he would like to see some closer bond of union between the parent society and provincial associations. He had always thought it would be a benefit both to the provinces and the trade generally, if Provincial Associations were affiliated to the Pharmaceutical Society in some such way as that propounded by Mr. Smith, and until such was wrought out, he would like the Society's funds to accumulate a little more. Fourth, their application at present might interfere in some way with the Scottish Branch of the Society at Edinburgh getting her due, which is at present much in need of assistance in more ways than one. And lastly, he believed they would hold a more independent position, and thus be able to keep a watch over the funds, in case of any indiscriminate distribution of them.

Mr. Kinninmont seconded Mr. Fairlie's amendment. He did not altogether agree with Mr. Smith in his idea of the Society sending out lecturers as examiners. He thought the benefits would hardly repay the expense. As regards the application for a grant, he objected to it on some of the grounds stated by Mr. Fairlie, but he also thought as an individual he could hardly ask for any assistance to the Association. All the money the Society made off him was somewhere about 1*s.* 6*d.* a year, after deducting the price of the Journal, postage etc., from his annual subscription; and until very recently Glasgow had not done much to benefit the Society generally. He had always thought, however (though he had not been successful in getting many to agree with him), that the Council might adopt some scheme of subsidizing the class fees of students attending the University only if they passed their examination. With reference to a library and museum, he thought that a consulting library should be the mode in which it might be adopted, and it should consist of books too expensive for individuals to purchase for themselves, and which most people would not read through, and being at hand for reference when any particular information was required. He therefore advised that the motion be withdrawn, which Mr. Fenwick did with consent of his seconder, reserving his right to bring it up at some future time.

MANCHESTER CHEMISTS AND DRUGGISTS' ASSOCIATION.

An ordinary Monthly Meeting was held in the Memorial Hall on Friday evening, November 3rd; Mr. J. T. Slugg, F.R.A.S., Vice-President, in the chair.

Mr. W. Wilkinson read the following paper on "Some of the Difficulties of Dispensing":—

We often meet with prescriptions which there is considerable difficulty in dispensing satisfactorily; and when I was asked to prepare a paper for this evening, it occurred to me that an account of some of these difficulties, with the method adopted to overcome them (where I knew it), was a subject on which an hour's discussion would not be altogether wasted. Of course I expect there are a good many here who know as much about the matter as I do, and perhaps more; but then my paper is not so much intended for them as for the younger members of our Association, to whom possibly a few hints on these matters may be useful, whilst I in return expect to hear something that may be useful to me.

Well, then, the difficulties we meet with in dispensing, or perhaps I should rather say in compounding, chiefly occur in mixtures, pills and ointments, and I propose to give some instances in each class, with the manner in which I have overcome them, when I have been able to do so.

With mixtures the trouble generally arises either from decomposition of some ingredient, or from non-amalgamation of the component parts, both these cases frequently arising from want of attention to the proper order of mixing: the latter are commonly of an emulsive character, consisting either of an alkali and oil with water or mucilage, and oil with water and other ingredients.

Here is one which I dare say many of you know pretty well:—

Pot. Carb. ℈ij
Aq. ℥viss.
Solve et adde—
Syr. Tolut. ℥ss
Ol. Amygd. ℥j.

That mixes pretty well if these directions are followed, but it does better if the salt of tartar is dissolved in an ounce or two of water, the syrup and oil added and well shaken, then the rest of the water.

Here is one with mucilage,—

Ol. Ricini ʒij
Sacchari ʒij
Mucil. Acac. ʒij
Aquæ ℥vj
Ol. Menth. Pip. gtt. ij.

This is best mixed in a mortar; rub the oil of peppermint with the sugar, add the mucilage and a little water, then the oil, and when these are well mixed, the remainder of the water gradually; you will then have a nice milky-looking mixture, without any globules of oil floating about. Always take care that the mucilage and oil are well mixed in this kind of mixture before the water is added, or you will have drops of oil floating about; and should any tincture or spirit form part of the ingredients, mix it with a little of the water, and let it be added last, or you may possibly find the mixture "come unmixed," for gum is precipitated from its solution by spirit; and do not forget that the oil is to be added to the mucilage, *not* the mucilage to the oil.

Here is a mixture of a different kind,—

Tr. Benz. Co. ʒij
Mucil. ℥ss
Liq. Morph. ʒj
Aq. ℥ij.

Now in this case, if you add water to the tincture, the benzoin is all precipitated and rises to the surface and it is impossible to mix it, but just shake the tincture well with the mucilage, then add the water and you are all right.

Here is another,—

Bals. Cop. ℥ss
Liq. Pot. ʒij
Sp. Lav. ʒiij
Sp. Nitr. ʒiv
Mucil. ℥ij.

The best way of managing this is to reverse the usual order of things, mix the liq. pot. with the spirits, add the balsam, shake together, then add the mucilage; so that you see chemical theory and dispensing practice do not always agree.

Mixtures with tragacanth powder or mucilage used to be very troublesome to me until I learnt how to manage them; this is another instance of an entire upset of orthodox dispensing practice.

The good old plan of using a mortar when powders form part of a mixture does not answer here, as every one who has tried it knows very well; but let the tinctures or spirits, if there are any, be put into the bottle first, the tragacanth powder added, all shaken together, then the water added, and your mixture is made without any trouble. If there should be no spirit of any kind in the mixture, half fill the bottle with water, add the tragacanth powder as the B. P. directs and you have no difficulty.

Then, again, vegetable powders, such as rhubarb or ipecacuanha, and compound powders, as Gregory, do not mix readily with water: well, in all these cases, the plan is to mix them first with any tincture or spirit there may be, and then there is no difficulty if there be no spirit. Mucilage or syrup is better than water. Bicarbonate of potash, or soda with citric acid, are often ordered together in mixtures, and the effervescence sometimes gives a good deal of trouble; but use an ounce or two of boiling water to dissolve the salts, the effervescence passes off directly, and you can finish your mixture at once.

The other day I had a mixture in which ʒij potass. cit. and ʒj ferri et quin. cit. were ordered with other ingredients; the potash happened to be alkaline and precipitated the quinine, which it ought not to have done, for the mixture should have been clear. It required about 15 grs. acid cit. to dissolve the quinine. Possibly some of you may have met with a similar mixture.

I once had a prescription which I had to make several times, but never succeeded in getting to mix, although I tried a different way each time. It was this,—

Glycerini ℥i
Mist. Acac. ℥ss.
Ol. Amygd. ℥j.
Syr. Aurant. ℥ss.
Liq. Calcis Sac. ʒss.
Aq. ad ℥viij.

And whichever way I mixed it, the liq. calc. and oil seemed to form a kind of insoluble soap, which separated immediately.

Now, with regard to pills. You all know the trouble they give sometimes; either they are too hard or too soft, or they will not mix, or they crumble to pieces in rolling out, or go contrary in some way or other, and are very difficult to manage satisfactorily. Some of the most troublesome masses to deal with are those containing essential oil,—peppermint, to my thinking, being parcularly cantankerous, more especially when ext. rhei is present. P. capsic. is another very unsociable article, and very often makes the mass crumble to pieces; but get a prescription with ol. menth. pip., capsic. and ext. rhei, and then you have a treat; indeed, it is hardly possible to give any general rule in these cases, for a good deal depends on the nature of the other ingredients; but if you find the mass crumbling or splitting to pieces on rolling out, it wants something to soften it a little in most cases.

Some time ago there was considerable discussion in the Pharmaceutical Journal as to the best mode of making creasote into pills, some recommending bees'-wax, and others something else. I find the best way is to rub the creasote, say 10 or 15 drops, with 10 grs. P. sap. cast., add the same quantity of light calcined magnesia, then sufficient liquorice powder. This forms a mass, which is sufficiently cohesive, and does not make the pills too large.

Ext. rhei is a particularly nasty article in pills, for it is generally either as soft as treacle or as tough as leather; but it seems an especial favourite with some of our Manchester prescribers. The way to overcome this difficulty is to powder the extract, and add to it a sufficient quantity of P. rhei to make up the weight lost in drying (which also prevents the powdered extract from running together again), and with a few drops of decoction of aloes the pills are made without any trouble.

Camphor is sometimes very troublesome in pills, especially if there be much of it; it seems to make the pills go hard and crumble in pieces; the best way to prevent this is to get the mass worked and rolled out as quickly as possible. Here is an example,—

Camph.,
Ext. Cinchon.,
Zinc Valer. āā ℈j.

This, if done quickly, and the ext. bark is tolerably soft, makes up without much trouble; but if left at all, it becomes quite hard, and requires a considerable quantity of mucilage to make it up.

When a pill mass is not much too soft a little P. tragac. is generally the best addition; but in cases where a large quantity of soft extract is ordered, this plan will not do. The only thing then is to leave out a portion of the extract, and use some dry powder in its place; for instance, we have often 2 or 3 grs. ext. hyosc. ordered with the same of blue pill. Nobody can make those into a satisfactory pill, supposing the extract to be in its usual state; but take about two parts of extract and one of P. hyosc., you then get a nice firm pill of the proper size. The same with ext. gent. and sulph. ferri, of which here is an example,—

Ferri Sulph. 12.
Ext. Gent. 48.
Ol. Cin. 12.

I should just like to see the prescriber make that into pills without any alteration. The only way to make it into a decent pill is to leave out about half the essential oil, and use nearly as much powdered gentian as extract.

I shall not detain you long with ointments, but there are two or three cases I will just mention. When you have an extract, such as belladonna, to mix with lard or any other fat, if you attempt to mix them together direct, there is considerable difficulty in getting a smooth ointment; but if you soften the extract first with a little hot water and rub it smooth, then add the lard, or whatever it may be, you have no trouble.

Glycerine is now frequently prescribed in ointments, and is difficult to mix. Well, supposing it be ordered with ung. zinci, as is often the case, do not use ready-made zinc ointment, but weigh the proper quantity of oxide, rub the glycerine with it, and then add the lard, you have then a good smooth ointment which does not separate; of course, the same plan can be adopted with any other powder. If there be no powder melt the ointment, but do not let it get too hot, and beat the glycerine in and stir till cold, it then mixes much better; but still, if there be a large proportion of glycerine, it will separate after a time.

Many other instances might be given, but the above are a few that I have met with in my own dispensing, and I have confined my remarks to them, hoping to hear during the evening something of the experience of others.

During the discussion which followed the reading of the paper, Mr. Siebold advocated the use of powdered gum instead of mist. acaciæ, which was so liable to decomposition. Mr. Siebold also suggested the addition of a small quantity of hyposulphite of soda to ung. potassii iodidi, to prevent its becoming discoloured; and alluding to the difficulty which dispensers felt in amalgamating watery extracts with fat, he said some lard manufacturers were evidently possessed of the secret, as some specimens of bladder-lard he had examined yielded, when melted, only 75 per cent. of lard.

Mr. Bostock observed that some lard manufacturers used considerably more pearlash than could possibly be needed for cleaning their vessels, and he understood it was sometimes added to whiten inferior lard.

Mr. Benger said the addition of a small quantity of alkali also rendered the lard capable of taking up more water. Commercial lard was very seldom fit for pharmaceutical purposes.

Some discussion followed on the best method of preparing pure lard, some gentlemen recommending that the "flare" be bruised in a mortar and washed in a stream of water, whilst others advised that it be melted at a low temperature (water bath) whilst very fresh, and without water.

A vote of thanks to Mr. Wilkinson closed the proceedings.

The next monthly meeting will be held on Friday evening, Dec. 1st. Tea at 7.30. Professor Williamson, F.R.S., will deliver a lecture on "The Natural History of the Minerals used in Medicine."

BRISTOL PHARMACEUTICAL ASSOCIATION.

The following are the arrangements for the monthly meetings of this Association, session 1871–72, which will be held at the Museum and Library, top of Park Street:—

1871—December 8—Lecture by Mr. Stoddart; 1872, January 12—Papers and Discussions; February 9—Lecture by Mr. Collens, Birmingham; March 8—Lecture by Mr. Warner, Bishopston; April 5—Lecture by Dr. Tilden, London; May 10—Lecture by Mr. W. Lant Carpenter, Clifton.

Proceedings of Scientific Societies.

BRITISH PHARMACEUTICAL CONFERENCE.

Meeting of Executive Committee, November 1st, 1871.

A resolution was carried unanimously to the effect that at all future Annual Meetings of the Conference the hire of rooms, the cost of printing programmes, and incidental expenses incurred by the Executive Committee, be paid by the Conference, and not by the Local Committee.

The secretaries reported that the whole of the manuscripts of the Year-Book of Pharmacy for 1871 and the Transactions of the Conference at Edinburgh were in the hands of the printer, and that the volume would be sent (by post only) to members in December. The London Secretary was directed to make the usual application to members for unpaid subscriptions, 1871–72, due in advance last July.

A notice to this effect will be found in the advertisement columns.

Mr. John Moss, F.C.S., was elected Assistant-Secretary.

The following were duly elected members:—

Appleby, Edward J.; Bevan, Martin L.; Blain, Arbuthnot H.; Booth, Richard; Bowling, J. H.; Clarke, Ingham; Croyden, C.; Dickie, James; Davies, J. R.; Davies, T.; Deering, Alfred; Field, James John, F.C.S.; Frazer, W., M.D.; Gill, J. W.; Green, G. E.; Grove, Harry; Hallawell, J.; Hilder, R. T., M.D.: Jones, C.; Ogilvie, George P.; Passmore, Francis; Pattinson, R. J.; Pinkerton, W.; Roper, H. E.; Rowell, Robert Henry; Simpson, R.; Snell, Charles Henry; Stooke, Arthur; Taylor, Richard; Tozier, William, L.A.H.I.; Wright, John A.

CHEMICAL SOCIETY.

November 2, 1871; Dr. Frankland, President, in the chair.

After the usual business of the Society had been transacted, a paper on "A Process for the Estimation of Fluorine," by A. Liversedge, A.R.S.M., was read. It consists essentially in distilling the fluoride with concentrated sulphuric acid and silica, passing the silicic fluoride which is evolved into ammonia, and then determining it as silico-fluoride of potassium. An interesting paper was then read by Mr. W. H. Perkin, F.R.S., on "Anthraflavic Acid," a yellow crystalline substance which accompanies artificially prepared alizarine, and with which the author finds it to be isomeric. The barium compound crystallizes from water in reddish-brown needles, which contain a considerable amount of water of crystallization. There was also a paper on "The Distillation of Wood," by Mr. Watson Smith.

SOCIETY OF ARTS.

Dyes and Dye-Stuffs other than Aniline.*

BY DR. CRACE-CALVERT, F.R.S.

Lecture I.

Red Colouring Substances.—Madder.

This well-known tinctorial substance may still be considered as the most important of all the dye-stuffs employed by calico printers, owing to the brilliancy of the colours, their permanence under the action of light and soap, and the wear and tear which fabrics so dyed can sustain, as well as on account of the variety of shade and colour that can be obtained,—one dyeing operation being sufficient to produce pinks, reds, purples, violets, puce, and black; and, notwithstanding the competition that madder colours have met with of late years from aniline dyes, I believe the quantity of madder consumed in England is quite as great at the present day as ever it was.

The employment of madder-root as a dye dates from the most ancient times, as is proved by the Egyptians using madder-dyed fabrics to wrap round their mummies. The Greeks and Romans were acquainted with it under the names of *Erythrodanon* and *Rubia*, and their modes of fixing it on cotton fabrics were the same as those now now employed, namely, aluminous salts for producing reds, and salts of iron for purples and blacks.

The plant which produces madder is an herbaceous one, and is called *Rubia tinctorum.* It bears a yellow flower, and a dark red berry fruit. The red colouring matter exists almost entirely in the cortical part of the root, little or no colour being found either in the epidermis or in the ligneous or centre part of the root. M. Decaisne and M. Edouard Koechlin have shown that the colouring matter in the fresh root is yellow, and becomes red under the oxidizing influence of the atmosphere. The same process goes on, to a certain extent, in the roots of the plant when they are allowed to remain several years in the ground, especially in chalk formations. In France, the roots are allowed to remain in the ground two or three years; in Turkey and the East, from five to seven. In the latter countries and in Naples, they are dried in the open air, but in Holland and France stoves are employed for this purpose. Naples and Turkey madders are imported in the root, and are known in commerce as Naples and Turkey roots, while those from France and Holland are ground, and sold under the name of French and Dutch madder.

* Cantor Lecture, delivered Tuesday, Feb. 7. Reprinted from the *Journal of the Society of Arts.*

One hundred parts of fresh root yield on perfect desiccation twenty parts of dried substance. The roots as imported always contain sixteen or eighteen per cent. of water; the fresh roots, therefore, give 24 or 25 per cent. of commercial madder. Dutch and Alsacian madder, after being ground, is stored in large casks, and kept for two or three years, when the colouring matter is developed, and its tinctorial power is much increased; if, however, it is kept five or six years, further changes ensue, and its value seriously decreases. French Avignon madder can be employed at once, although the quality is much improved by keeping it one or two years. The best Avignon madders are grown on lime formations. The roots that have a red colour are called *palus*, and those that are pink *rosées*,—the former being considered the finest. The value of these madders is in ratio to the fineness of their powder, the finer powder containing the most colouring matter.

The nature of the chemical changes occurring in madder during the time it is stored, and which so much improves its commercial value, was entirely unknown until the elaborate and interesting researches of Dr. E. Schunck, F.R.S., published in the year 1851. He succeeded in isolating a peculiar ferment called *Erythrozym*, which possesses the property of decomposing a substance called by him *Rubian*. Rubian may be considered as a glucoside (this name being given by chemists to compounds of sugar with other organic principles), and is decomposed by erythrozym into a peculiar sugar and *Alizarine*. Whether there are in the rubia-root several glucosides which unfold themselves respectively into sugar and one of the colour-giving principles, or there is only one glucoside, and its colour-giving principle as it is liberated gets successively oxidized into alizarine, purpurine, etc., is not yet satisfactorily determined. Still, this valuable discovery of Dr. Schunck has thrown much light on the subject, and has led to several important commercial improvements, to which I shall call your attention as I proceed. One hundred parts of dried madder-root consist of—

Soluble in cold water	55 parts.
Soluble in boiling water, and which contains the greater part of the colour-giving principles	3 "
Soluble in alcohol	1·5 "
Fibrous matter	40·5 "

I shall make no remark on the gum, mucilage, pectine, pectic acid, and pectates which the rubia-root contains, but state that the water extract contains also the yellow colouring-matter discovered by Kuhlmann in 1824, and called by him *Xanthine;* but this colour has never received any commercial application, from its want of brilliancy. Water also dissolves another colouring principle called *Chlorogenine*, which is decomposed by weak acids into sugar and a brownish-green matter. Both these colouring substances are sources of annoyance to the calico-printer, as they render very difficult the obtaining of pure whites in printed goods, and they dim the brilliancy of the shades produced by the combination of alizarine and purpurine with the mordants. Further, the cold water dissolves the sugar contained in the root, and on the Continent it is transformed into alcohol. The yield of alcohol varies with the nature of the root, and ranges between 7 and 10 lb. per cwt. of root. This fact shows that there is from 10 to 15 per cent. of sugar in the root.

Messrs. Julian and Roquet have based on the above facts a commercial process for preparing a purified madder, which they call *fleurs de garance*, of which several million pounds are now manufactured in France per annum. It not only yields brighter colours than the original madder, but, as it does not soil the white parts of prints, its use saves the printer much soap and labour. To prepare the *fleurs de garance*, the madder is mixed with eight or ten parts of water, and left for three or four days at a temperature of 75° to 80° F., when fermentation ensues, transforming the sugar of the root into alcohol, which is collected. The madder, deprived of all soluble substances, is dried, and ready for use. A hundred parts of madder yield from 55 to 60 per cent. of *fleurs de garance*. I may state, *en passant*, that the injury which Dutch and Alsace madders sustain when kept too long in casks is doubtless owing to the fact that, after the erythrozymic fermentation is completed, an alcoholic and lactic one sets in, which acts injuriously on the colour-giving principles.

I now proceed to lay before you the outlines of two interesting processes for extracting commercially the two useful colour-giving principles, *Alizarine* and *Purpurine*.

The first is due to M. Leitenberger, and is based on the fact that purpurine is soluble in water at 130° F., whilst alizarine only dissolves at 170° F. He mixes madder with water, and heats the whole gradually, by means of a jet of steam, to 130°, at which temperature it is maintained for some time. The liquor is then run off and filtered. To the clear solution, lime, or, still better, baryta, is added, when a lake precipitates. This is washed and mixed with hydrochloric acid. The purpurine thus liberated is thrown on a filter, washed, and is ready for use. The madder remaining from the above operation is dried and heated in close vessels with wood spirit, which dissolves the alizarine. This extract, thus obtained, after being concentrated by distillation, is ready for use. A hundred parts of root yield from two to three per cent. of purpurine, and four or four and a half per cent. of alizarine.

The second process, that of Professor Émile Kopp, is based on another discovery of Dr. Schunck, namely, that weak acids acts upon rubian in the same manner as erythrozym, unfolding it into sugar and alizarine. M. Kopp found, some years since, that sulphurous acid dissolved the glucosides of purpurine and alizarine, and applied this observation as follows:—600 lb. of Alsace madder are macerated for twelve or fifteen hours with 800 gallons of a weak solution of sulphurous acid, to which is added one-thousandth part of hydrochloric acid, to neutralize the earthy carbonates existing in the root. This operation is repeated three times. To the liquors, three per cent. of sulphuric acid are added, and the whole heated to a temperature not exceeding 140° F., when red-coloured flakes separate and gradually deposit, which, when washed and dried, are commercial purpurine. The liquor is then carried to the boil for a couple of hours, and allowed to cool, when a dark green powder is found deposited in the vessels, which, when washed and dried, is commercial alizarine.

This process has been carried out by Messrs. Schaaffer and Lauth for many years, and no doubt yields a larger amount of colour-giving principle than M. Leitenberger's method, the glucosides being doubtless more completely decomposed by the acids than by water alone. It has the further advantage of obtaining the colouring matters free at once, which have only to be washed to be ready for use.

The dyeing power of the alizarine thus obtained is equal to forty times its weight of madder, or ten times that of garancine. These colouring substances, except green alizarine, are not substituted for madder in the dyebeck, but are printed on the cloth and steamed, as will be described further on.

M. Kopp found that his green alizarine is a mixture of alizarine with chlorogenine; and that this latter body can be separated by treating the mixture with a light oil of tar, having a boiling-point of 300° which dissolves the chlorogenine. Alizarine is employed in the production of rich purples, whilst purpurine is used for reds and pinks.

Before describing pure alizarine and purpurine, I may state as a fact very interesting, although of no commercial value, that if superheated steam be passed over a preparation of a madder known as garancine, pure alizarine is volatilized, and may be easily collected.

Pure crystallized alizarine was discovered, in 1824, by MM. Robiquet and Colin, by treating madder with strong sulphuric acid, when they produced a black mass, which they called "charbon de garance," and which, on being heated at a moderate temperature, yielded crystals of alizarine.

In 1851, Dr. Schunck succeeded in isolating from madder a substance to which he gave the name of *rubian*. This he effected by filtering a hot decoction of madder on pure animal black, which is washed with cold water to remove chlorogenine. The washed charcoal is boiled repeatedly with alcohol, and the alcohol solution evaporated to dryness. The dry mass is dissolved in water, and acetate of lead added, which gives rise to a precipitate. This precipitate, when acted on by sulphuretted hydrogen, gives pure rubian in solution. When rubian is acted on, either by erythrozym or weak acids, it is decomposed, yielding, according to Dr. Schunck's paper, alizarine and water; according to M. Schützenberger, alizarine and glucose, or grape-sugar.

(*To be continued.*)

MEETINGS FOR THE ENSUING WEEK.

MONDAY Nov. 13. ......*Medical Society*, at 9 P.M.
London Institution, at 4 P.M.—"Nervous Matter: its Structure and Properties." By Professor Huxley. (Educational Course.)

WEDNESDAY Nov. 15. ...*Society of Arts*, at 8 P.M.—Opening Address by Lord Henry G. Lennox, Chairman of the Council, and Distribution of Medals.

THURSDAY Nov. 16. ......*Chemical Society*, at 8 P.M.
London Institution, 7.30 P.M.—"The Influence of Geological Phenomena on the Social Life of the People." By Harry G. Seeley, F.G.S.

Parliamentary and Law Proceedings.

ADULTERATION OF BREAD IN MELBOURNE, AND THE SCIENTIFIC EVIDENCE THEREON.

We have been favoured by a Melbourne correspondent with the subjoined report of an appeal case before the Judge of a County Court by a baker convicted of adulterating his bread, which may prove interesting to English readers. The whole of the bakers in Melbourne had had their bread seized by the police, and in every instance the Government analytical chemist found alum present. The bakers, as a rule, denied the practice, and protested against the correctness of the analysis.

William Johnson, Government analytical chemist, was sworn, and deposed that he examined a loaf of bread from Mr. Black's establishment, handed to him by the police.

How much alum did you find?

Alum itself is not *usually* found in bread, because in the process of baking alum gets decomposed. When it is mixed with bread, it is not possible to dissolve it out with water, and the only way is to ignite the bread, and recover it in the form of alumina, which is the base of alum. It was alumina I recovered from this bread, and I recovered a quantity equal to four grains of alum to the pound of bread. This was the smallest quantity in any of the eighteen loaves handed to me by the police. I only operated on four ounces of this loaf. In those four ounces I found three-tenths of a grain of phosphate of alumina, which equals four grains of alum.

Cross-examined by Mr. Billing as follows:—

When did you cut those four ounces out?—The next day after receiving the loaf.

How long did your analysing operations occupy you after that?—About six weeks. I was very busy, and could not devote my whole attention to it.

Where did you keep this piece of bread?—In my private room, locked up. It was wrapped in the same piece of paper the loaf came in. It was not possible for dust to get on it.

When did you burn it?—Not for some little time.

How did you proceed?—I first digested a small slice of the loaf in water mixed with logwood.

As a chemist, can you say that an infusion of logwood is considered a safe test?—No; but it will always indicate alum when it is present.

If there were other woods in the infusion as well as logwood, would not the same violet colour be produced?—Yes, as logwood would continue to act in the same way in the presence of other woods. But I may say that this was only a preliminary test, and that I abandoned it as not being satisfactory. For instance, there were some samples of bread that logwood did not affect, and I thought there was no alum in them; but they turned out the worst when I applied the next test.

You do not, then, consider logwood a safe test?—No.

You have changed your views on this since you gave evidence a week ago at the District Court?—Yes. I said it was a useful test then.

Did you not say it was an infallible test?—I might have done so, but do not think I did.

Does common salt contain alumina?—I will not swear it does not, as salt is of various qualities.

Well, then, take table salt or Liverpool fine salt.—That is quite pure. There is no alumina in it.

Do you know Hassall's work on 'Adulteration of Food'?—Yes; it is a good authority.

Do you differ from this passage, where it states that salt contains minute quantities of alumina?—No.

In the passage, he says that in two samples of salt there was alumina amounting to 0·05 and 0·06. What does that mean?—It means that in the first there was one-twentieth of a grain of alumina in one hundred grains of the salt.

How much alum would this be equal to?—One-ninth of a grain of alumina equals one grain of alum, or about this.

Taking the figures in Dr. Hassall's book as correct, how much alum would there be in a quarter-ounce of salt?—About nine-twentieths of a grain of alum in about one hundred grains, or nearly half an ounce of salt,—a fraction less than half a grain in fact.

How much alumina did you find in this bread?—One thirty-ninth of a grain. What I found was in the condition of phosphate of alumina. Making the calculation from it, and allowing one-fifth for error, I worked it out to four grains of alum to the pound of bread.

Were you sure it was all phosphate of alumina, and not other salts?—Yes, quite sure.

You know Muspratt's 'Analysis of Salts'?—No. He is no authority.

Supposing that he is no authority, would you think it impossible for salt to contain alum if in his work he gives instances?—No. He is a great compiler, and would be likely to be correct.

Do you know if potatoes contain alumina?—Yes; they do.

Have you ever found alumina in salt?—No.

How much alumina is there in potatoes?—Since the case at the District Court, I have found a quantity equal to eight grains of alum to the pound of potatoes.

Have you ever analysed the Yan Yean water the bakers use?—Yes.

Any alumina in it?—About one grain of silicate of alumina in a gallon; sometimes more.

Would there not be more in the winter time, when this loaf was made, owing to the muddiness?—Yes. There would be considerably more clay, or silicate of alumina, in the water then.

Have you ever analysed yeast?—Yes. Since the cases were heard at the other court, I have found seven-tenths of a grain of phosphate of alumina in two ounces of yeast, which is equal to nineteen grains and a fraction to the pound of yeast.

Do you believe Mr. Black put alum into his bread when he says he did not?—I do not think he did.

Might not the four grains of alum be easily accounted for by the presence of alumina in the ingredients naturally?—I do not think that more than half of the alum found could thus be accounted for. But I do not believe the bakers put alum in their bread, and I have good reason for believing it was in the flour. I examined six samples of flour, and found alum in all of them, in quantities varying from eleven grains to twenty-eight grains to the pound of flour. The amount of alum in the flour did not correspond to the amount in the bread. In one case, for instance, there were eleven grains of alum in the pound of flour, and only two grains in his bread; and in another only five grains in the bread, while he had twenty-eight grains in his flour. They must have more than one lot of flour.

His Honour Judge Cope then asked if the quantity alleged to be found over what Mr. Johnson had stated might be in the bread naturally would be unwholesome or injurious to the consumer?—The reply was that it would not.

His Honour then said that it was possible that such a small quantity, that nothing short of a scientific test could discover, might have got in accidentally or unavoidably, or without the defendant's knowledge or consent, in which case he was not liable. It seemed to him that the millers were, according to Mr. Johnson, more to blame than the bakers, and should have been proceeded against. The conviction was quashed, but without costs, as he considered the appellant must pay for the accidental introduction of the alum.

In the next case—one similar—Mr. Johnson stated that he had discovered the equivalent of $18\frac{1}{2}$ grains of alum in each pound of bread.

Cross-examined:—How much alumina did you find in this bread? I found phosphate representing $1\frac{3}{10}$ths of a grain of alumina, which equals eighteen grains in the pound.

This case was decided against the baker, as his Honour held that such a large quantity as eighteen grains to the pound could not have got into the bread accidentally.

Suicide of a Chemist.

On Saturday morning last Mr. Corbett Smith, chemist and druggist, of High Street, Bromsgrove, was found dead in bed by his housekeeper, who noticing that he did not come down as usual to open his shop, went into her master's room to ascertain the cause. An inquest was held upon the body the same afternoon, when, from the evidence, it appeared that deceased, a bachelor, aged forty-one years, and well known as a man of a jovial and easy temper, had been drinking rather of late. On Friday he was more than usually excited, and rather unsettled in his mind and manner, and when he returned home, after spending the evening out, about twelve o'clock, he was not sober. He was not seen alive after that time, and when found in the morning had evidently been dead some hours. On the table in his sitting-room was found an ounce-bottle half full of prussic acid, and by his bed-side, on a chair, was a medicine glass, which had contained some liquid. Underneath the candlestick was a paper, upon which was written in pencil, in deceased's handwriting, "From this world of long suffering and trouble I now make my exit. Friends, farewell." There were also some vague expressions. The light was put out, all the room was in perfect order, and deceased was lying with his hands folded upon his breast, as though in a deep, calm sleep. After hearing the evidence of Dr. Prosser and the other testimony, the jury returned a verdict "That deceased committed suicide by taking prussic acid whilst in a state of temporary insanity."—*Standard.*

Suicide by Strychnia.

On Saturday last an inquest was held in Westminster to inquire into the death of Mr. Antonio Bini, described as an Italian surgeon. Evidence was given that as the deceased, who had been in practice as a medical man in Castle Street, did not make his appearance, the door of his room was broken open, when he was found dead, and a glass containing a strong solution of strychnia on the table. The body presented the appearance of strychnia poisoning, which was confirmed by a *post mortem* examination. A verdict was returned that the deceased poisoned himself with strychnia while of unsound mind.

Poisoning by Laudanum.

On Saturday last the coroner for East Middlesex held an inquiry at Mile End, upon the body of a child, aged four days. It appeared that the mother had been taking medicine containing a small quantity of laudanum, and one empty bottle stood upon the bed-room shelf, another bottle containing one dose standing beside it. A small quantity of aniseed was fetched, and incautiously placed in the empty bottle, and the nurse, by mistake, gave the child a portion of the contents of the wrong phial, the consequence being that death supervened shortly afterwards. A verdict of "Death by misadventure" was returned.

Suspected Poisoning by Antimony.

At an inquest held last week at Bilston, Dr. Alfred Hill, of Queen's College, Birmingham, deposed that he found antimony in the stomach of a child aged eleven. The father is a puddler. Deceased was seized with excessive vomiting and purging, and died the same day. Sufficient antimony to cause death was found even after excessive vomiting. The mother denied having administered it in any shape. She had buried nine of her twelve children, and some of them died as this one did. The coroner has ordered the exhumation of the child last interred.

Review.

A Systematic Handbook of Volumetric Analysis. By Francis Sutton, F.C.S., Norwich. Second Edition. J. and A. Churchill. 1871. Pp. 377.

Although we find it difficult to admit without the proverbial grain of salt, the observation of a distinguished French chemist that "chemistry is a French science, having been founded by Lavoisier, of immortal memory," we feel bound to allow that illustrious man a position in the front rank of those who taught first the principle upon which all science, and the science of chemistry especially, relies, namely, quantitative exactitude. In the words of Sir William Thomson, "Accurate and minute measurement seems to the non-scientific imagination a less lofty and dignified work than looking for something new. But nearly all the grandest discoveries of science have been but the rewards of accurate measurement and patient and long-continued labour in the minute sifting of numerical results." This was the solid, if not the brilliant part of the philosophy of Lavoisier. It is true he was not the first who performed quantitative analyses, nor is his work distinguished by any very remarkable accuracy; but still we are indebted to him for systematically preaching the doctrine of quantity and practising it. After him came Berzelius, whose labour, so patient, so vast, and withal so exact, stands a monument alike to warn and to stimulate future generations of chemists. But these men and their successors for half a century worked by methods which were almost exclusively gravimetric. In the determination of quantity they have relied almost entirely upon the conversion of the substance into some form, either elemental or as a compound of known composition, which could be conveniently placed upon the pan of a balance and weighed. But unfortunately the separation of bodies one from another is a task which, though it has occupied the lifelong endeavours of some of the most acute experimenters, must yet be looked upon as far from complete.

In addition to this, suppose an element isolated from the companionship of its congeners, it must then, if it does not present the stability and fixity required for gravimetric purposes, be converted into one of its compounds, the composition of which is accurately known and which presents the necessary physical characteristics. Chemists found out at last, however, that some of the difficulties and much of the tediousness of gravimetry might be eluded by employing processes based upon another principle.

This principle has consequently come to be of great importance, and the art of volumetric analysis in high esteem. In English we have but one book devoted to this subject, and that is Sutton's 'Volumetric Analysis,'—a work which reflects the very highest credit on the skill and experience of the author.

Mr. Sutton explains the leading idea of volumetry as follows:—

"Suppose, for instance, that it is desirable to know the quantity of pure silver contained in a shilling. The coin is first dissolved in nitric acid, by which means a bluish solution, containing silver, copper, and probably other metals, is obtained. It is a known fact that chlorine combines with silver in the presence of other metals to form chloride of silver, which is insoluble in nitric acid. The proportions in which the combination takes place are 35·5 of chlorine to every 108 of silver; consequently, if a standard solution of pure chloride of sodium is prepared by dissolving 58·5 grains of the salt (*i. e.* 1 at. sodium 23, 1 at. chlorine 35·5 = 1 at. chloride of sodium 58·5) in so much distilled water as will make up exactly 1000 grain-measures; every single grain-measure of this solution will combine with 0·108 of pure silver to form chloride of silver, which precipitates to the bottom of the vessel in which the mixture is made. In the process of adding the salt solution to the silver, drop by drop, a point is at last reached when the precipitate ceases to form. Here the process must stop. On looking carefully at the graduated vessel from which the standard solution has been used, the operator sees at once the number of grain-measures which have been necessary to produce complete decomposition. For example, suppose the quantity used was 520 grains; all that is necessary to be done is to multiply 520 by the coefficient for each grain-measure, viz. 0·108, which shows the amount of pure silver present to be 56·16 grains."

And this is the general principle of volumetric analysis. We have not always to do with silver and chlorine, but the principle is applicable to all those cases in which a definite chemical reaction occurs, the completion of which can, by observation or by the use of some simple test, be recognized immediately and with precision.

"In alkalimetry it is the change of colour produced in litmus, turmeric or other sensitive vegetable colouring matter. The formation of a permanent precipitate, as in the estimation of cyanogen. A precipitate ceasing to form, as in chlorine and silver determinations. The appearance of a distinct colour, as in iron analysis by permanganate solution, and so on." It must be obvious that wherever the method is applicable a great saving of time and trouble is accomplished. Further than this, it has been abundantly shown that in a very large number of cases volumetric processes rival successfully, as to accuracy, the more tedious gravimetric operations.

All practical chemists, however, know that volumetry has, like gravimetry, its defects, and we think Mr. Sutton has exercised a very laudable and judicious moderation in limiting the number of processes which he recommends in this capital book of his. A great defect with which special books are so often chargeable is that the authors endeavour to extend their subject beyond its true and legitimate limits, and to give to it a wider generality than it has any right to.

Sutton's 'Volumetric Analysis' is known in every laboratory where technical chemistry is practised, but we fancy some of his former readers will hardly recognize their old friend in the magnificent volume into which he has developed. The book is very considerably enlarged, "the modern system of atomic weights has been adopted in the present edition, but the alteration is in many cases merely a nominal one, since the systematic arrangement previously in vogue facilitates the calculation of results and needs in no way to interfere with the theory of the chemical constitution of bodies."

Water analysis is a subject of entirely recent growth, and a very useful article is contributed to the volume by Mr. W. Thorp, principal assistant chemist to the Royal Commission on the Pollution of Rivers.

Those who are interested in gas analysis will be really indebted to Professor M'Leod for the very able and lucid article, illustrated by drawings from his own pencil, which occupies some seventy pages at the end.

Hitherto Bunsen's valuable 'Gasometric' has been the only book at the disposal of the student. For the English reader it is now superseded.

We cannot conclude without congratulating Mr. Sutton, as a *pharmaceutical chemist*, upon the production of this important addition to scientific literature.

Obituary.

We regret to announce the death, from phthisis, on October 16th, of Mr. John G. Dale, F.C.S., at the age of 31. The deceased gentleman was connected with the firm of Roberts, Dale and Co., Chemical Manufacturers, of Warrington, of the town council of which town he was a member. At the meeting of the Warrington town council on the 31st October, the mayor in a few feeling remarks, mentioned the loss the town had sustained, and moved that a resolution of condolence with the widow of their late colleague should be passed. After this had been supported by several other councillors, who all bore testimony to the great worth of the deceased, it was carried and ordered to be forwarded to Mrs. Dale.

We have also to record the death, on Monday, October 30th, of Mr. William Wootton, Pharmaceutical Chemist, of Wolverhampton, aged 44.

The following journals have been received:—The 'British Medical Journal,' Nov. 4; the 'Medical Times and Gazette,' Nov. 4; the 'Lancet,' Nov. 4; the 'Medical Press and Circular,' Nov. 8; 'Nature,' Nov. 4; the 'Chemical News,' Nov. 4; 'English Mechanic,' Nov. 3; 'Gardeners' Chronicle,' Nov. 4; the 'Grocer,' Nov. 4; the 'Journal of the Society of Arts,' Nov. 4; 'Food, Water and Air,' No. 1, for November; the 'Practitioner' for November; the 'Brewers' Guardian' for November; 'Transactions of the Odontological Society' for June; 'Journal of Applied Science' for November; the 'Doctor' for November; 'Bromsgrove, Droitwich and Redditch Weekly Messenger,' Nov. 4.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

THE PRELIMINARY EXAMINATION.

Sir,—On looking over the Journal of last Saturday, I am much surprised to find that your correspondent "*Spes*" has fallen into an error in his analysis of the candidates. In referring to this town, he says 3 candidates presented themselves, and the 3 failed to pass. This is not correct; and I hasten to inform "*Spes*" that two out of the three candidates did pass the examination, and received the Society's certificates to that effect. Doubtless "*Spes*" has fallen into the same error in his analysis of the other towns and cities, consequently his remarks cannot be relied upon. I may as well inform "*Spes*" that the two candidates' names were in the Journal of the 21st as follows:—

William Powell Watkins Blackwood.
William Davies Trecynon.

In justice to the above-named successful candidates I hope, Sir, you will insert this contradiction.

T. W. EVANS, *Chemist,*
Local Secretary to the Pharmaceutical Society.
Aberdare, November 6th, 1871.

Sir,—The letter of "Spes" on the last Preliminary examination gives some startling statistics; a further analysis of the list may be curious, if not instructive.

Examinations were held in 101 towns, with a total of 222 candidates; the percentage of failures, in round numbers, was as follows:*—

	No. of towns.	No. of candidates.	Passes.	Failures.	Percentage of failures.
Total	101	222	140	82	37p.c.
London	1	30	9	21	70
Country	100	192	131	61	32
11 towns, "Spes".	11	44	6	38	87
Other country towns	89	148	125	23	17

I give the figures for what they are worth; in some respects they are humiliating enough. I do not think, however, we can draw any very definite conclusions from them, for lack of other materials and standards of comparison.

It would be interesting to know what proportion of those plucked were fresh from school, and how many had been in the trade for possibly years, also what percentage of failures is found in the Cambridge and Oxford, London and Durham, Civil Service and other examinations. May there not also be some truth in the statement of Mr. Snell (Lond. Univ.), that the examination of the Society is behind the age, and that injustice is done to the candidates?

I should be sorry to palliate our own shortcomings by reference to the failings of others; it would not be wise to do so; but if the impression gains ground that the ordeal through which our apprentices have to pass is too severe the effect will be injurious, and many promising young men will be deterred from entering the trade. If our failures are not greatly in excess of what, under the circumstances, might be expected,—and I do not think they are in the aggregate,—we may take heart, and urge our young men to increased efforts to pass creditably. At present the trade is in a transition condition, and some time must necessarily elapse before we are equal to the new order of things.

If some such plan as that named by Mr. Ince was generally adopted, failure in the Preliminary would be reduced to a minimum. I could myself furnish several instances where young men, acting on my advice, have put themselves for three or four months under special instruction for a few hours weekly before going in for the Preliminary, not one of whom failed to pass.

I would suggest that, in future, you add a column to the Preliminary, showing the number of passes in each town; it would add much interest to the list, and show whether the same towns are constantly weak.

Hull, November 7th, 1871. JAMES BAYNES.

* It will be seen that, although the figures are correct in the aggregate, the details, being founded upon "Spes'" letter, are incorrect.

Sir,—I am saddened but not surprised at the large percentage of candidates "plucked" at the recent Preliminary examination.

Allow me, Sir, to re-enforce the argument which constituted the keystone of the position assumed in the paper on the apprenticeship question I had the honour of reading at Edinburgh, namely, that the Preliminary examination, or its equivalent, should be passed prior to apprenticeship commencing.

Want of time at the July meeting prevented, I know, several gentlemen from speaking, who were prepared to have discussed the subject, with the view specially of enforcing this particular point.

In papers on Provincial Education that have subsequently appeared in the Journal, the question has been casually referred to, and I am gratified by observing in the current number a more positive and distinct reference to it in the interesting paper on North German Pharmacy, by my friend Mr. Greenish.

Feeling strongly on the matter, I am convinced that the attention of our body must be yet more emphatically directed to it. I have letters now lying before me, from widely separated parts of England, stating the evil to be as rife as ever. Most imperfectly educated youths are being taken by men possessing neither the time nor the requisite qualifications to grind up their pupils for the Preliminary.

I am credibly informed that in some cases neither parents nor pupils are previously made acquainted with the compulsory tests of pharmacy, before deciding on the future calling of life.

Let the *public* thoroughly understand that the successful passing the test of a liberal education, in the form of one of the prescribed examinations, is a *sine quâ non*, to enter the vestibule of pharmacy.

Let *our brethren* distinctly understand that they sin against their own interests in accepting educational responsibilities they ought not to be saddled with, and one important step will have been secured towards that goal enlightened pharmacists are aiming at, and which our chartered status, together with the demands of society, render imperative. S. R. ATKINS.

Market Place, Salisbury, November 7th, 1871.

Sir,—I shall be glad if you will allow me to correct an error (a natural one I admit) in the statistics of "Spes," in the Journal for November 4th. He gives a list of twelve towns at which 74 candidates presented themselves for the last Preliminary, and finding only 15 names to the credit of those towns in the list of successful candidates, concludes that all the rest have failed, and says that such an unfavourable result reflects discredit on those towns. It would be so, if his conclusions were correct, but he has fallen into error by supposing that all the candidates resided in the towns in which they were examined. This is not the case. In Manchester, for instance, 4 only of the candidates reside in its neighbourhood, the others residing at Bolton, Burnley, Bury, Huddersfield and Rawtenstall. Three of these were successful, and their names appear in the list to the credit of their respective towns; so that there were 6 successful candidates out of the 9, instead of 3, as given by "Spes," and only 1 unsuccessful candidate from Manchester proper, instead of 6. The same remarks apply to the other towns, although I do not know the exact numbers.

I have been enabled to examine a correct table of the results in those twelve towns selected by "Spes," in which I found that the successful candidates number 38, instead of 15, and the failures 36, instead of 59,—bad enough indeed, but still showing that the large towns do not furnish such a proportion as he supposes.

As the reputation of Manchester candidates has previously suffered in a similar way from the same cause, I send a statement of the numbers who have presented themselves here at the last six examinations, with the results, as follows:—

Date.	Candidates.	Passed.	Failed.	Strangers Passed.	Strangers Failed.
June 20, 1870 . . .	3	3	0	0	0
October 3, 1870 . .	11	11	0	2	0
January 2, 1871 . .	16	12	4	1	0
April 3, 1871 . . .	12	4	8	0	0
July 3, 1871 . . .	14	12	2	3	1
October 10, 1871 .	9	6	3	3	2
	65	48	17	9	3

Showing a little over one-fourth, or 26 per cent. of failures, which certainly does not exceed the average.

I believe one cause of so many failures is to be found in the age of the candidates, many of whom are eighteen to twenty years of age or more, and were apprenticed before the passing of the Pharmacy Act, when no examination was expected; consequently, very little care was taken about their education, which we now find was too often lamentably deficient; and they find it very hard work indeed to acquire sufficient knowledge to enable them to pass; for it requires a very strong determination, and power of application which few possess, to enable a young man at that age, with no regular teacher and perhaps only an hour or two at night for study, to overcome the disadvantage he labours under from want of early training.

W. WILKINSON.

Cheetham Hill, Manchester, Nov. 7th, 1871.

Sir,—I wish to call the attention of "Spes" to an error he has fallen into in his letter on the failures at the last Preliminary Examinations, as far as this place at least is concerned. Taunton is represented as all having failed; that is not the fact, for although four presented themselves for examination, one of whom did pass, not one belonged to the town, and had they all passed, it would not have appeared in the return to which he refers. It is not fair, therefore, to look at the name of the town only.

I may mention that out of fifteen who have presented themselves this year at this centre, seven have passed, and although this is not what it ought to be, it is not quite so bad as "Spes" makes it appear.

Taunton, November 7th, 1871. HENRY PRINCE.

Sir,—Your correspondent "Spes," in his letter which appears in the Journal of last Saturday, makes a great mistake in reference to the five candidates who underwent the Preliminary examination at Swansea, on the 2nd ult. He states that all failed, and laments that this and other large places should turn out such a number of failures. "Spes" appears to draw his inferences from the fact that the candidates are not set down as residing in the towns in which the examinations took place. Those who came under my supervision lived at certain distances from Swansea, viz. two at Pontardawe; one at Llandilo; one at Aberavon; one at Llanelly, although entered for Leamington. If "Spes" will carefully examine the list, he will find no cause whatever for branding the district which I have the honour to represent, as all the candidates passed.

With the charge of casting darts, the "brethren" here have nothing to do; and as to "Spes'" advice to look at home, feed the flocks well and attend to their digestion, I trust that the chemists, as a body, are too honourable to neglect those under their charge.

THOMAS BREND,
Local Secretary.

Swansea, November 8th, 1871.

IMPROVED TINCTURE PRESS.

Sir,—I am pleased to find my opinion corroborated by my quondam assistant Mr. Watts, whose experience of other presses, fairly contrasted with mine, would be free from the prejudice allowed in favour of one's own hobby. But for the length of my letter last week, I purposed to add a few words on that very important part of the principle of screw-pressure—the inclined plane. In the PHARM. JOURN. Oct. 21st, I described the (theoretical) power of my press, with screw-threads one-eighth of an inch, and recommended an increase of power by reducing the threads to a twelfth of an inch; the advantage of this method of increasing the power being that it would also diminish friction (obviously by reducing the angle of inclination of the plane represented by the screw), but a conversation with a friend who denies my theory, and asserts that the increased power may be obtained quite as effectually by an extension of leverage only, throws a doubt on my accuracy, which may be shared by other readers of your Journal. I will consider the two cases separately. First, the twelfth of an inch thread with eight-inch levers, multiplies the power $8 \times 6 \times 12 = 576$ times, or twelve circumferences of the lever for each inch of depression. Now the eighth of an inch thread would only require eight circumferences of the lever for an inch of pressure, consequently, for the same multiplication of power as in the finer thread, the levers would have to be extended to twelve inches ($12 \times 6 \times 8 = 576$). Now, although these results are identical in theory, I opine that in practice they differ materially, the advantage being in favour of the smaller angle of the fine thread. I have heard objections to this thread as being too delicate to bear the enormous pressure I would put upon it; but I think not, for no manual power applied to a nut an inch deep, so as to extend it over quite a dozen threads, could do injury; although I grant that it might not bear the strain of applying the power direct to the male screw, as in the ordinary single screw-press; but of course care must be taken to ensure sufficient strength in all the parts of such an implement. The screws must be tempered after the thread is cut, as that operation causes brittleness, which must be avoided. The diameter of the rod should be about 0·6, or three-eighths of an inch, exclusive of the threads; this would require the angle of the inclined plane to be about 3° for the finer and 4° 30′ for the coarser thread. They may be represented with tolerable accuracy by two laths twenty inches long, the end of one raised one inch, and the other one inch and a half, when the greater power required to force a given weight up the steeper incline will be obvious. But is not this additional power given by the extended lever? It certainly is, but the result is accomplished only by greater friction than would be required to force the weight up the gentler incline. But I fear I am trespassing on ground belonging rather to the engineer or mechanician, than to the chemist, although I see no reason why the latter should not have something to say on a subject of much interest to him. The success of my double screw-press, in practice, leads me to hope that I may have the satisfaction of bringing into use a cheap, convenient and powerful implement, which, I believe, will far surpass anything yet introduced; but even if I am in error, I may do good, as before done by heretics in religion, politics or science, viz. by bringing out the truth.

C. A. STAPLES.

Fulham, S.W., November 6th, 1871.

"*Quærens*."—We would recommend you to add the tincture last; but we do not think that, under any circumstances, the mixture would present a satisfactory appearance.

"*Sigma*."—Use gelatine and glycerine as a basis. (See PHARM. JOURN. 3rd Ser. Vol. I. p. 446.) Or, if a few drops of water were added to the chloride of zinc,—making a saturated solution of it,—we do not think much difficulty would be experienced in preparing the pessaries.

H. Dunn.—The substance of your communication has already appeared in Dr. Tilden's "Chemical Notes to the Pharmacopœia" (PHARM. JOURN. 3rd Ser. Vol. I. pp. 564, 623).

J. R. Coldwell.—Aq. menth. vir. would generally be used.

"*Natator*."—(1.) Like ferri ammon. cit. (2.) It would be rather difficult to determine the quantity; but, to ascertain the presence of strychnine, try one drachm of it on a dog or a cat.

R. Lake.—Not if the tincture contain the proper quantity of quinine.

"*Nostrum*."—Melt the white wax, spermaceti and butter together. When these have partially cooled, add the powdered white lead and brandy; place the vessel in cold water, and stir well until cold.

J. T. R.—There is not the least probability that any of the present bye-laws relating to the examinations will be altered to suit cases like that of our correspondent.

R. R.—We have no further information upon the subject beyond that already published.

The Library and Museum.—We have received a letter from *T. S. M.*, in which he endorses the opinion expressed last week by "A Chemist's Assistant," that it would be of advantage to many if the Library and Museum were kept open on two evenings in the week until nine or ten o'clock. He also suggests that efforts to shorten the number of hours during which pharmaceutists keep their shops open should be made by the members of the Council in their respective localities.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. G. F. Schacht, Mr. D. Jenkin, Mr. A. Davison, Mr. J. E. Howard, Mr. W. L. Goldsworthy, Dr. Kidd, Mr. E. Nuttall, Mr. W. Moss, Mr. D. W. Scott, "Natator," "Juniperis," "Sabina," "Spes."

SHALL THE PHARMACEUTICAL SOCIETY CEASE TO BE AN EDUCATING BODY?

BY G. F. SCHACHT.

This question has many times been suggested by men who seldom allude to such themes for the sake of mere rhetoric, but, possibly because the time was scarcely ripe for its full discussion, it has hitherto failed to arrest the general attention of pharmacists.

It received, however, something like a formal re-introduction at the hands of Mr. Mackay in his recent address to the students; and I venture to express a few opinions upon the matter, in order to continue the discussion, for I fancy I detect certain indications that point to the necessity of some speedy modifications in the practical working of our Society, if not to such organic changes as appear, at first sight, to be involved in the position introduced by Mr. Mackay.

There appears to exist in the majority of minds the feeling that educational and examining duties ought not to coexist in the same body. The justification for this feeling is, probably, the fear that in his capacity of examiner, an individual is unduly tempted to show favour to those with whom he has been associated as teacher. The objection undoubtedly has weight, and, appealing as it does to a principle that touches the whole value of examinations, one is compelled to admit that the association of these two sets of duties in the same person or body of persons is not wise. Now, the law absolutely requires that the Pharmaceutical Society should examine; and though it is true the very individuals appointed to examine have nothing directly to do with teaching the candidates, yet the Council that appoints the Examiners appoints and pays the professional teachers also, and maintains a school within the walls in which the examining duties are carried on.

I must at once guard myself from being supposed to impute the smallest suspicion that favour has ever been shown to any candidate from this or any other influence. I simply discuss the subject in the abstract, and point out that the Society does fulfil the two sets of duties in Bloomsbury Square, and that there exists a feeling that this is not right.

On the other hand, it would be scarcely an exaggeration to assert that the basis of the Society's existence during its entire history, has been the one fact that it aimed to educate the pharmacists of this country to a higher professional standard; and the content with which its members have seen its large resources lavished upon the school at Bloomsbury Square, may be taken as a proof how fully they have recognized scientific education to be an absolute duty, and have approved the effort—partial though it was—towards its accomplishment. There is no doubt many of the founders and life members that have gone to their rest cherished the hope that their labour and money would help to the gradual exaltation of all chemists and druggists into a thoroughly educated body; and I feel persuaded the majority of those still living are attached to our Association chiefly by the constraining influence of a similar aspiration.

The Government, then, requires us to *examine*, and the members expect us to *educate*, and both demand that each set of duties shall be performed with perfect independence the one of the other.

The problem is, to devise a plan by which the double needs of the case can be satisfied. With deference, and in the hope that the proposition will be amply discussed, I suggest the following:—

I propose that the Society cease to appoint and employ any professional teachers, and cease to maintain any school-buildings or laboratories of instruction, except in the now unavoidable capacity of owners of property; and, in the place of its present partial system of education, I propose that it adopt a comprehensive one, framed upon the method employed by the Government in the Science and Art Department.

The details of this method are fully set forth in the 'Directory,' published by the Department annually; but its principles are probably familiar to most readers of this Journal, who will, therefore, know as well as I do, that they are simple and perfectly easy of application to our case.

The Society, supposing the proposition were adopted, would hold once a year, simultaneously over the whole country, an examination in chemistry, botany and materia medica. The questions would be arranged by a staff of professors (not teachers in any school of pharmacy) appointed by the Council, and the answers, having been prepared under the prescribed regulations, would be returned for estimation. The examiners would, in the first case, divide the candidates into two sections, the accepted and the rejected; the latter must try again. The former would be again divided into three classes, the boni, the optimi and the senior optimi. Each of the boni might be considered to have earned *for his teacher* a certain fixed premium, each of the optimi a larger premium, and each of the senior optimi, in addition to this premium for his teacher, a prize or certificate of honour for himself.

This is a broad sketch of the Government method as applied to pharmacy. It is unnecessary at present to enter further into details, but I may just say that I have been familiar with the Government scheme in its full working for some time, and know of no difficulty likely to arise in its application.

On the other hand, its adoption seems to me to offer a solution for most of the difficulties that at present surround the case. The Society would continue to exercise its examining functions as before, but would cease to identify itself with any educational staff or establishment. At the same time, it would promote the scientific education of the whole body of which it is the professed head, by a comprehensive scheme eminently practical and as eminently just. The scheme itself would serve to bind together, by the potent tie of an equal common interest, every individual in the trade, and thus vastly strengthen the hands of our executive in their efforts for further good; and by bringing all schools, whether metropolitan or provincial, into one common arena, there to be estimated and supported solely according to the results they can accomplish, not only would that admitted difficulty, "provincial education," disappear as a distinct and separate question, but local and individual enterprise throughout the whole country would receive an impetus that could not fail to result in a largely increased amount of good healthy educational work.

CHLORAL.

BY W. A. TILDEN, D.SC., F.C.S.

(*Concluded from page 342.*)

Chemical Characters of Chloral.—Chloral is a colourless oily liquid, of a rather disagreeable odour, very soluble in water, alcohol, ether, benzol and other solvents. When pure, it boils at about 201° F. (a little under 94° C.); sp. gr. at 18° C., 1·502, nearly identical with that of chloroform, but a little higher.

Mixed with the due proportion of water it becomes hot, and sets on cooling into a crystalline mass of the hydrate C_2HCl_3O, H_2O. This substance, when slowly crystallized, forms rhomboidal prisms, but is usually met with in confused crystalline masses. It melts at 122°–123·8° F. (50° to 51° C.), and boils at a temperature which is always below 212° F. (100° C.), but which is estimated by different observers at various points between 203° F. (95° C.) and 210·2° F. (99° C.).

Hydrate of chloral contains 89·12 per cent. of chloral and yields by decomposition by an alkali, 72·20 per cent. of chloroform. Its aqueous solution should give no turbidity with nitrate of silver.

Chloral, mixed with any alcohol, furnishes a crystalline alcoholate; the formula of the ethyl-alcoholate, for instance, being C_2HCl_3O, C_2H_6O. This substance melts at 114·8° F. (46° C.) and boils at 234°–239° F. (112·5°–115° C.). It contains 76·22 per cent. of chloral, and yields, by the action of alkalies, 61·76 per cent. of chloroform.

Both pure chloral and its aqueous solution are said to dissolve many of the alkaloids, among others morphia, quinia and strychnia. It is also capable of taking up considerable quantities of some substances, such as camphor and carbolic and benzoic acids, which are by themselves but sparingly soluble in water. Chloral hydrate is miscible with glycerine.

Chemical Constitution.—Chloral appears to be purely an aldehyd; in fact, the aldehyd of trichloracetic acid. For it not only resembles ordinary acetic aldehyd in its general reactions, but these two bodies are convertible one into the other. Thus, like aldehyd, it forms a solid isomer, *metachloral*, into which it is for the most part converted soon after separation from the hydrate by sulphuric acid. This metachloral is a white amorphous body, quite insoluble in water, but gradually reconverted into the soluble form by ebullition with water, or by distillation. It is not at present known whether there exist other modifications corresponding to the liquid polymers of aldehyd.

Then it forms with ammoniacal gas a compound which corresponds to aldehyd-ammonia, and which possesses the same power of reducing silver in the form of a mirror when warmed with a solution of the nitrate.

Like aldehyds in general, it combines with bisulphites of the alkali-metals, and, when boiled with hydrocyanic and hydrochloric acids, produces a syrupy compound, probably analogous to lactic acid.

By oxidation, chloral is converted into trichloracetic acid, just as aldehyd yields, under the same circumstances, though with greater facility, acetic acid.

$$\underset{\text{Aldehyd.}}{C_2H_3OH} + O = \underset{\text{Acetic Acid.}}{C_2H_3OHO}$$

$$\underset{\text{Chloral.}}{C_2Cl_3OH} + O = \underset{\text{Trichloracetic Acid.}}{C_2Cl_3OHO.}$$

Notwithstanding this close general correspondence between the two, there is necessarily an important difference in certain properties and reactions, the existence of which must of course be referred to the presence of the three atoms of chlorine in chloral. Thus, the action of alkalies upon aldehyd is to give, under ordinary circumstances, resinous products; or, by a properly-contrived experiment, hydrogen and an acetate are procurable.

$$\underset{\text{Aldehyd.}}{C\left\{\begin{array}{l}CH_3\\H'\\O\end{array}\right.} + \underset{\text{Potash.}}{(OK)'H}$$

$$= \underset{\text{Potassic Acetate.}}{C\left\{\begin{array}{l}CH_3\\(OK)'\\O\end{array}\right.} + \underset{\text{Hydrogen.}}{H'H}$$

But chloral yields, by contact with alkaline solutions, chloroform and a formate—

$$\underset{\text{Chloral.}}{C\left\{\begin{array}{l}(CCl_3)'\\H\\O\end{array}\right.} + \underset{\text{Potash.}}{(OK)'H} = \underset{\text{Potassic Formate.}}{C\left\{\begin{array}{l}(OK)'\\H\\O\end{array}\right.} + \underset{\text{Chloroform.}}{(CCl_3)'H}$$

This replacement of hydrogen by chlorine also probably explains the deficiency in that eagerness for oxygen which is so characteristic of aldehyd. Aldehyd, moreover, forms no hydrate. Opinion is at present divided as to whether the hydrate and alcoholates of chloral are molecular compounds or not. The question is, whether in hydrate of chloral, for example, the molecules of chloral and water stand side by side without change, or whether in the act of union a single molecule is formed which comprises neither chloral nor water as such. On the one hand, it may be argued that dehydrating agents readily remove water from the hydrate, setting chloral free; and that even distillation of the compound causes a partial separation of the two. Further, that the alcoholate when treated with an alkali yields chloroform, a formate and alcohol. On the other hand, the alcoholate is stated to give, by the action of pentachloride of phosphorus, not chloride of ethyl among the products of the reaction, as it should do if it contained alcohol, but a compound, in the generation of which the elements both of chloral and alcohol are concerned.

The alcoholate is also represented as differing in its physiological action from the hydrate. Until better evidence, however, is adduced, it will be more convenient to regard these bodies as containing chloral and either water or an alcohol.

Action of Dehydrating Agents upon the Hydrate.—Sulphuric acid mixed with hydrate of chloral produces considerable depression of temperature. On gently heating, a separation of liquid chloral occurs, which after a time becomes partially opaque from the formation of metachloral. If a considerable excess of sulphuric acid is employed, there is produced another solid body, which has been named *chloralide;* the nature of which is, however, but imperfectly understood. It seems to result from the metamorphosis of part of the metachloral.

$$\underset{\text{Metachloral.}}{C_6H_3Cl_9O_3} = \underset{\text{Chloralide.}}{C_5H_2Cl_6O_3} + \underset{\text{Chloroform.}}{CHCl_3.}$$

Alkalies.—It has already been shown how alkalies effect the decomposition of chloral into formic acid and chloroform.

Ammoniacal gas unites with chloral to form, if kept perfectly cold, C_2HCl_3O, NH_3, the analogue of aldehyd ammonia: but if allowed to become heated, chloroform and formamide $(CHO)H_2N$ are produced.

Chloral unites with many of the derivatives of ammonia, amides such as acetamide and urea, and bases such as aniline, and, as already stated, many of the natural alkaloids.

Action of nascent Hydrogen.—By adding zinc to a solution of chloral hydrate, acidulated with hydrochloric or sulphuric acid, the chlorine is removed with substitution of an equivalent quantity of hydrogen. Aldehyd is thus obtained:—

$$\left.\begin{matrix}O\\H\end{matrix}\right\}C_2\left\{\begin{matrix}Cl\\Cl\\Cl\end{matrix}\right. + 3H_2 = \left.\begin{matrix}O\\H\end{matrix}\right\}C_2\left\{\begin{matrix}H\\H\\H\end{matrix}\right. + 3HCl$$

Chloral. Hydrogen. Aldehyd. Hydrochloric acid.

Considerable quantities of aldehyd might be thus procured, unless, as is probable, the whole, or part of the product, is in the form, not of aldehyd, but of its isomers.

Action of Oxidizing Agents.—Chromic acid and nitric acid both convert chloral into trichloracetic acid.

$$\underset{\text{Chloral.}}{C_2Cl_3OH} + O = \underset{\text{Trichloracetic acid.}}{C_2Cl_3OHO.}$$

Nitric acid of sp. gr. 1·2 appears to have but little, if any, action upon chloral hydrate, and, indeed, it dissolves in fuming nitric acid without any immediate change. With the latter, however, it gradually undergoes oxidation after a few hours, or immediately on applying heat.

Analysis of Chloral Hydrate.—Several methods have been proposed, founded upon the production of chloroform when the hydrate is agitated with alkaline solutions. If the experiment be performed in a graduated tube, the volume of the separated chloroform can be read off, and its weight calculated from this datum.

Details of the methods recommended will be found in papers which have been published in the PHARMACEUTICAL JOURNAL. Another plan, which is in some respects preferable to the others, consists in the direct observation of the amount of chloral liberated by admixture with warm sulphuric acid.

But these tests, though possessing a certain value, do little towards the detection of those other chlorinated bodies which may so easily occur, though only in small quantities, without suspicion. In fact, it has not been shown, by any published experiments, that the liquid which separates in the reaction with alkalies is really pure chloroform, or whether it may not also include products of the decomposition of those other bodies. Moreover, the alkaline aqueous superstratum is invariably coloured brown, and this alone is an indication either of the presence of foreign matters, or that a portion of the chloral is changed by the alkali into something other than the normal products, chloroform and formate. A qualitative test is therefore desirable, and nitric acid appears to me to be one of the most promising reagents. Some experiments upon the subject are, however, wanted.

Further, whenever the alkali method is adopted, it would be worth while to employ pure ammonia or lime, or potash if properly diluted, and in every instance, until experience has shown it to be useless, to ascertain if the aqueous fluid separated from the chloroform gives, with nitrate of silver, any very marked indications of chloride. The production of any considerable amount of precipitate will point to the probability that the sample has been imperfectly purified, and is open to suspicion.

It might be advantageous even to estimate, by means of a standard solution of silver (an easy operation), the amount of chloride left in solution by different samples, after treatment in the same manner. It is by no means improbable that a more accurate estimate might in this way be formed of differences of quality than is at present possible by the methods commonly in use.

DRUGS FROM NEW CALEDONIA.

Mr. Bavay, a French pharmacist, who has lived for a long time at the French settlement, New Caledonia, Australia, has brought home several drugs which have been described by L. Soubeiran as follows:—

Ouliépé is a resin obtained by mastication of the buds of *Gardenia ouliépé*, Vieill., *edulis*, Vieill., and *sulcata*, Gærtn.; it is used by the natives as a cement and for caulking ships; it has a yellow colour, an aromatic, disagreeable taste and a glossy fracture. It is met with in compact lumps, if obtained from the lumps, or as a yellow powder from quickly dried leaves and pounding them. Soubeiran thinks the ouliépé resin is similar to decamali from East India, obtained from *Gardenia gummiflora* and *lucida*, Roxb., and there used in the hospitals as a covering of wounds to protect them from insects and to absorb the smell from ulcers. The last-mentioned resin is often taken for eleme.

Kaori, a gum resin obtained from the trunks of *Dammara Moorii*, Lindl., *ovata*, Moore, and *lanceolata*. Yellowish or white, brittle, with a smooth shining fracture; on distillation it yields an essential oil of aromatic odour. It is soluble in alcohol and may be used as a varnish.

Morinda tinctoria, Roxb. From the bark of the root of this plant Bavay claims to have separated alizarine; the natives use a decoction of this root and of the leaves of a species of *Barringtonia* for dyeing skins red.

Peziza Auricula-Judæ, sometimes very abundant in New Caledonia, is an article of export to China, where this fungus is used as food, or, according to others, in the manufacture of varnishes.

Ocotea aromatica. The aromatic bark furnishes an essential oil of agreeable smell, somewhat like oil of wormwood and sassafras.

Santalum austro-caledonicum, Vieill., the *tibo* of the natives, formerly very abundant, has become very scarce, because the trees, on account of the fine aromatic yellow wood, have been felled to such an extent, that now only the stumps and roots left from former times can be utilized.

Myoporum tenuifolium, Forst. The wood of this tree is used as a substitute for sandal-wood; the fragrance of the fresh wood is very pleasant, but it soon loses it after being kept some time.

Andropogon Schœnanthos is cultivated in the plains of New Caledonia by the natives, who use it medicinally, and who believe it to impart a pleasant taste to the yam roots, together with which it is grown. The plant is closely allied to *Andropogon citriodorus*, from which the lemon-grass oil is obtained.

Melaleuca viridiflora, Gærtn., which is named *niaouli*, is no doubt the most interesting product of New Caledonia; the tree is found very frequently, but mostly isolated from other trees. The natives utilize the thin cork layers of the bark for technical purposes; the leaves serve the soldiers and colonists as a spice. The last yield on distillation a colourless or yellow, very aromatic oil, similar to oil of cajeput, of a sweet and piquant taste, soluble in water, but more so in alcohol.—*Journ. de Pharm. et de Chim.*, *March*, 1870, p. 242.

THE ACTION OF HYDROGEN UPON NITRIC ACID.

BY E. BOURGOIN.*

As the result of a series of electrolytic researches previously published, the author has shown that there is satisfactory ground for assuming that when nitric acid is diluted with a considerable quantity of water a hydrate of the formula $N_2O_5, 4H_2O$ is produced; notwithstanding that H. St. Claire Deville, from an examination of the action of zinc upon nitric acid, has assigned to the same body the formula $N_2O_5 . 2H_2O$. When this acid, in different degrees of concentration, is submitted to the action of the electric current, it is supposed to undergo decomposition in the following manner:—

$$N_2O_5 . 4H_2O = (N_2O_5 + O_4) + 4H_2;$$

oxygen gas alone being evolved at the positive pole, while the acid steadily concentrates at the same point. At the negative pole hydrogen is set at liberty, but this gas, finding itself at the moment of liberation in presence of a certain amount of nitric acid, reacts upon the latter, with results varying according to the concentration of the acid. The examination of this latter action is more especially the subject of the present paper.

I. When a very dilute solution, previously freed by boiling from dissolved oxygen, is submitted to electrolysis, pure hydrogen alone is evolved at the negative pole; the nitric acid during the whole period of the experiment not being sensibly affected by the nascent gas. The analytical results confirm this assertion.

II. When the solution is less dilute, corresponding nearly to the formula $N_2O_5 . 2H_2O + 12{\cdot}5$ Aq., the hydrogen evolved, at first pure, soon contains a small quantity of nitrogen, and towards the termination of the experiment, ammonia may be detected in the decomposing cell.

III. With a solution one-fourth of the preceding strength, $N_2O_5 . 2H_2O$, 38 Aq., hydrogen only can be collected at the commencement, as in the previous instance: the gas, however, soon contains nitrogen, which latter decreases gradually, till, having attained a maximum, it finally disappears. This reaction is explained by the fact that, during the experiment, the acid, becoming gradually weaker, is at length no longer able to evolve nitrogen. The liquid was carefully examined for nitrous oxide, which, owing to its ready solubility, would have remained in solution, but the results in this particular case were always negative.

IV. When the solution is much more concentrated, containing only 15 eq. of water, no hydrogen is evolved from the negative pole, although oxygen is freely liberated from the positive pole; the whole of the hydrogen set at liberty reacts upon the acid, and the products of this reaction remain at first dissolved. The solution surrounding the negative pole soon acquires a blue coloration, and then hydrogen, mixed with a small quantity of nitrogen, is slowly liberated. After some hours a new gas appeared, which gradually but completely replaced the hydrogen, and finished by disappearing in its turn, as shown in the accompanying table. The gas proved to be nitric oxide:—

Gas collected.	1 hour.	12 hours.	15 hours.	20 hours.	30 hours.	48 hours.	50 hours.
Hydrogen . .	98·96	92·5	—	69·1	83·1	98·6	100·
Nitrogen . . .	1·04	3·5	1·4	3·4	10·1	1·4	—
Nitric oxide .	—	4·0	98·6	27·5	6·8	—	—

Towards the termination of the experiment, the negative liquid contained a considerable quantity of ammonia, and possessed, moreover, the characteristics of an aqueous solution of nitrous acid: it reduced permanganate of potassium and chloride of gold, and when neutralized with an alkali, not only blackened a solution of ferrous sulphate, but disengaged ruddy vapours upon the addition of dilute sulphuric acid.

V. When the pure acid, $N_2O_5 4H_2O$ is electrolysed, the evolution of gas, at first *nil*, soon becomes extremely rapid, and the gas which is collected is entirely absorbable by a solution of ferrous sulphate: it is pure nitric oxide. After a while hydrogen makes its appearance, when the liberation of nitric oxide slowly ceases.

The foregoing gaseous mixtures were analysed by mixing them with oxygen, and then adding a solution of caustic potash; the excess of oxygen having been removed by pyrogallic acid, the hydrogen was determined by explosion in the usual way. In conclusion, the author states that these experiments show that nitrous acid, nitric oxide, nitrogen, and ammonia result from the reducing action of hydrogen upon nitric acid, and that they furnish additional evidence of the energetic action of hydrogen gas, when the latter is capable of exerting its power in the nascent state.

* *Journ. Pharm.* [4], xiii. 266–270, from the *Journ. of the Chemical Society.*

CINCHONA CULTURE IN THE EAST.

According to the last published official report recently received on the cinchona culture in Java for the second quarter of the present year, the number of cinchona plants of all ages, sorts and sizes, have increased during that period from 1,730,705 to 1,741,525. In April and May all the developed cinchona plants of the valuable sorts planted out in open ground were pruned, to the manifest advantage of the trees. This pruning yielded 2485 kilogrammes of bark, which was forwarded to Batavia in thirty boxes. The valuable kinds of cinchona-trees have not yet been regularly turned to account; hence it is no wonder that the Java barks exported so far have stood no comparison with the South American barks of commerce. A disease has for some time been affecting some of the trees; but it has been greatly on the wane during the quarter, owing to the favourable weather, and the repeated sprinkling of the diseased plants with a decoction of tobacco and a solution of the polysulphuret of calcium. In May and June an official commission visited the eight cinchona plantations, with the object chiefly of endeavouring to trace out the nature of the disease. A long and close investigation convinced them that it must be looked upon as arising from parasitic vegetation, whose origin cannot be pointed out with certainty, because it shows itself very irregularly under varying circumstances. However much this disease may hinder the undisturbed and natural growth of the plants, it does not, as a rule, kill the latter; many of them, though severely attacked, have been able to recover vigorously. It has also been ascertained that this disease is not peculiar or confined to the cinchona plants, for it has been observed elsewhere on other kinds. The preparation of the so-called quinium from Java barks of a fine quality promises to yield, for medical purposes, a substitute for the costly quinine. Therapeutical experiments made with this preparation during the previous year have given very encouraging results; and, although the experiments made in the State Laboratory at Wetteren to prepare quinium with profit cannot be looked upon as successful, they have succeeded elsewhere, and will be continued on a larger scale. Attention has often been drawn to the estimation steadily gaining ground for the alkaloids allied to quinine. The results of the experiments made in British India have been made public by the British Government. These results bear out the conviction that, as soon as an opportunity presents itself for the preparation of alkaloids in Java, the costly demands for quinine from Europe will speedily be brought to a minimum, for the Java barks, when fresh and gathered from healthy trees, contain abundance of alkaloids. A supplement to the report gives a sketch of the experiments made in British India.*

BOTANICAL DESCRIPTION OF CUNDURANGO.†

The cundurango or condor vine, a name derived from the two Quichua words cundur and ango, is a climbing vine resembling much in its habits the grape-vine of our own forests. Springing from the seed generally at an altitude of from 4000 to 5000 feet, and on the western exposure of the Andes, after growing to the height of three or more feet, a slim little stalk, it reaches out and finds some strong arm to lean upon; it prefers the tallest trees and clings closely to their trunks, winding firmly around them, following the growth to the extremity of their limbs; and sometimes, for want of other support, returning upon itself, weaving a curious rope of cundurango strands. The natives insist that there are two varieties of the vine, the amarillo or yellow, and the blanco or white; but careful observation failed to reveal any difference between the two, except in the colour of the wood; the leaves, flowers, fruit and seeds are exactly the same. To the critical observer the wood of one appears of a somewhat deeper yellow colour than the other; which I attribute to the more direct influence of the powerful rays of the sun, the blanco growing more in the shade. Both possess equal medicinal properties.

Cundurango vines of five inches in diameter have been found, but generally they are from one to three inches in diameter. They are quite flexible when fresh, but when dry very brittle; the bark, which is the part containing most of the medicinal properties, is, externally, of a greenish-grey colour, and has numerous small warty excrescences. When freshly cut, it gives an abundant milky viscous juice or sap; it is somewhat fibrous, and the cut portion of the dry bark presents small yellowish dots, easily distinguishable. The odour is balsamic, the flavour peculiar and decidedly an aromatic bitter. The leaves are large, sometimes reaching six inches in length by five in breadth, opposite, simple, entire, cuspidate, cordate, and of a dark green colour. The flowers are small, arranged in umbels complete, of valvate præfloration, five low stamens, sepals five, petals five, filaments small, the pollen collected into granular masses, the ovary double, the fruit—a pair of dehiscent pods—follicles, five inches in length, flattened on their inner sides and joined at the stem and vertex. The seeds are numerous, dark brown and flattened, each with a long coma attached to one end. The vine, in many particulars, evinces its relationship to the Asclepiadaceæ family—approaching the genus *Periploca*, or, according to the classification of Linnæus, the *Pentandria Digynia*.

These vines are found at the same altitude and on the same exposure of the mountains in nearly all the province of Loja, but those containing the most powerful medicinal qualities are probably most abundant in the mountains of the cantons of Loja, Calvas and Paltas, extending south towards the line between Ecuador and Peru. Judging from my own observation and the statements of the natives of that region, I believe the true cundurango, or that which I have described and which has given the wonderful effects upon cancer already known to the world, is not abundant. There are very many, some fifty or more, varieties of bejucos or climbing vines in Ecuador, several of which give a milky sap, and some may and probably do have medicinal properties more or less potent; several are known to be poisonous. The great difficulty of obtaining the bark of the genuine vine and transporting it over the mountains to the coast, and the high price which its medicinal properties will command, may operate to induce the export of the bark of many of these other vines which may be not only comparatively inert, but many of them positively injurious, an event much to be feared, and which, for the protection of the people whose necessities require them to use the medicine, should be scrupulously guarded against. The authorities of Ecuador will no doubt soon take the proper steps to prevent the exportation of any but the bark of the genuine vine. Of the value of the cundurango as a remedial agent, I fully assured myself while in the interior of the country, both by personal observation in some twenty cases of chronic diseases of the blood, and from natives who had used it, particularly from Señor Don Manuel Eguiguren, Governor of the Province of Loja, a man universally beloved and respected by all who know him, and whose kindness and invaluable assistance have placed me under lasting obligations to him. The cases of cure of chronic ulcers by the administration of cundurango which have come under his immediate attention, and which he testifies to and speaks of with such genuine enthusiasm, are truly marvellous, and entirely set at rest any doubts I may have entertained, and coupled with evidence presented from Quito, from Guayaquil, and all through the interior, establish beyond a question the value and efficacy of this newly-discovered remedy as an alterative and purifier of the blood. To the President, Garcia Morena, to our excellent Minister, Hon. Rumsey Wing, and to Señor Governor Eguiguren the world is indebted, for the most part, for this great boon—a knowledge of the existence and powers of cundurango; and to them Ecuador owes another jewel in her crown, whose place shall be next to that priceless one set there by the discoverer of cinchona bark.—*New York Druggists' Circular.*

THE PREPARATION AND PROPERTIES OF THE VARIOUS KINDS OF CHINESE TEAS.*

BY F. PORTER SMITH, M.B. LOND.

(*Concluded from page* 388.)

It will be remembered that the leaf used in the making of Congou tea (black) is first dried in the sun, and then compressed, so as to part with any superfluous moisture. This must lead to a concentration of the principles contained in the leaf. The tea-leaf is stored in bags, and generally subjected to a preliminary "firing" in addition to the formal "firing" previously described, in view of any delay which may occur during the collection of such large quantities as are necessarily prepared at one time for the foreign market. Certain chemical changes tending to the oxidation of the chemical constituents of the natural leaf must take place in the repeated exposure to a moderate heat, and during the storing together in loose heaps of the half-dried leaf freely

* See PHARM. JOURN. 3rd Series, Vol. I. p. 325.

† Extract from the Official Report of Dr. P. T. Keene to the U. S. Department of Agriculture; from N. Y. Drugg. Circ.

* From the *Medical Times and Gazette.*

exposed to the atmosphere. Nothing like fermentation ever takes place, as this would issue in the destruction of the leaf, which is carefully kept from becoming heated or mouldy during the process of making up the whole "chop." A kind of maturation occurs, issuing in the formation of more extractible matter, capable of solution and circulation. The final "firing" has something of the same effect upon the tea-leaf as the kiln-drying has upon the germinating barley passing into malt—it fixes the composition of the tea-leaf, and renders any further change as unlikely as undesirable. The tea-leaf is then at its best, and any idea of ripening upon the voyage is simply absurd. It follows from the low temperature at which the tea is dried that no empyreumatic products can be met with in properly prepared tea. And yet there is a degree of austerity produced in the ordinary black tea which causes it to produce nausea, sickness and diarrhœa when taken in the shape of a strong infusion prepared from the new spring tea just ready for the voyage to Europe. This is especially the case with badly-secured leaf, which may be assumed to have been purposely exposed to a high temperature in order to fit it for the foreign market. All or most of these effects pass off by the time that the tea reaches the foreign consumer. The more stable the tea, the better it will turn out. Any change on the voyage is for the worse, according to the experience of the most competent judges. Thirty pounds of the green leaf produce from eight to ten pounds of the sun-dried leaf. One hundred pounds of the sun-dried leaf lose eight pounds of weight in "firing," and produce ten pounds of stalks, fifteen pounds of tea-dust, and the rest good marketable Congou tea. New tea produces in China laxative effects upon foreigners, as prepared for exportation. This effect is not permanent. As a rule, black tea, under the same circumstances, has a decided diuretic effect, even in hot weather, when perspiration is abundant. It excites in many a strong craving for food, and causes a degree of sleeplessness. The narcotic effect of new tea is asserted by Johnston in his "Chemistry of Common Things," but has never been noticed. The large proportion of nitrogen in tea, amounting to nearly 6 per cent., prepares us to find powerful properties in it. That tea is a stimulant there can be no manner of doubt. This probably depends upon the presence of the theine, a soluble crystalline substance, which resists the moderate temperature at which the leaf is dried. The peculiar taste of green tea falsely suggests the presence of more than the usual amount of that astringent principle which, in the shape of tannin, is present in about equal quantity in both the black and green tea. The properties of tea as an astringent are turned to account by the Chinese, who prescribe it in diarrhœa when acidulated with vinegar. Cold tea, to which a small quantity of dilute sulphuric acid has been added, is an excellent diet-drink for use in hot weather when there is a tendency to diarrhœa. That the use of tea to a large extent has a peculiar effect upon the nervous systems of both animal and organic life there can be no doubt. This is the reverse of a sedative influence. Some of the craving of the Chinese for opium is connected with their incessant drinking of tea, especially upon an empty stomach. The effect of tea is to excite, and this property may be turned to excellent effect in cases of opium-smoking, and in uræmic poisoning. If good new Congou tea be given in the latter disease, there is the additional advantage of the diuretic effects of the infusion. In all cases in which coffee is most to be prescribed, tea is much more convenient, accessible and powerful. It is obvious that the high temperature at which coffee berries are roasted must be fatal to the presence of much caffeine, a principle identical with theine. This latter substance has been recently proposed by Mr. Lewis Thompson (*Medical Times and Gazette* for February 10, 1871) to be brought into use as a tonic remedy in typhoid diseases, neuralgic affections and in senile gangrene. Large quantities of weak tea, however, tend to the occurrence of sciatica and other forms of neuralgia. The experiments of Peligot seem to prove that, as might be assumed from the presence of so large a proportion of nitrogen, tea is, as the Frenchman said of the coffee, both "meat and drink." Old women who boil their tea-leaves are right, for they thereby extract much more of the theine. The antidotal power of tea, so strongly insisted upon by the Chinese, is worth a trial, especially in cases of poisoning by tartar emetic or corrosive sublimate. A statement appeared in an English paper, some few years ago, to the effect that tea is an aphrodisiac, and that its extensive use partly explains the fertility of the Chinese population. It is remarkable that, as the Chinese have made the subject of aphrodisiacs a very profound study, no reference is made to this effect in Chinese medical works. As Liebig has suggested that theine goes to make taurine, a biliary substance, it is possible that the spermatic secretion may be increased by a course of strong tea. Of the effect of tea upon the menstrual secretion the Chinese have no doubt. It may be that in this way the female population of Great Britain have actually hit upon a perfect cure for their "irregularities," as they are called in quack advertisements.

The use of tea in certain forms of dyspepsia is a common Chinese practice. If taken as a plain drink between meals, it seems to give tone to the stomach. It is obvious that the "tea" of our domestic tables, a compound of milk, sugar and much water, is not the article intended to be spoken of in these pages. The sooner *infusum theæ* is placed in the British Pharmacopœia as a recognized article of the materia medica, the more likely are we to place its employment upon a scientific basis, and thus to rescue a very important drug from the contempt of familiarity. A tincture of tea is not a desirable preparation, as theine is only sparingly soluble in cold alcohol. An extract of tea, carefully prepared, would be an excellent preparation for trying the effects of tea in the delirium of fever and the stupor of intoxication.

The Chinese are under the impression that foreigners are compelled by some instinctive necessity to send and buy the tea of the land of "the Glory of Summer." Of the influence of tea upon the sobriety of our countrymen and countrywomen there can be no doubt. When our poor people cease to waste their tea-leaves, and begin to eat them as a dish, like the people of Mongolia and Siberia, another important step will have been taken in the direction of completely utilizing the properties of this most important article of diet and medicine.

Brick tea might economically be introduced into use on board our ships of war, as it is cheap, portable, good, and much less perishable than ordinary tea.

THE PRINCIPLES OF GAS ILLUMINATION.*

(*Concluded from page* 386.)

With regard to the effect of heating the gas, it was stated that when the U-tube was immersed in boiling water (temp. 212°, the normal temperature being taken to be $64\frac{1}{2}$° F.), the illuminating power of the gas-flame rose from 100 to 104; and when melted paraffin was substituted for the water, and the temperature of the gas thus increased to 288°, the illuminating power rose to 118,—showing an increase of 18 per cent. in the illuminating power of the gas, in consequence of the rise of temperature.

Such results appeared to the referees inexplicable on any grounds yet known. From experiments made in connection with various plans of sulphur purification, it is known that when gas is raised to a high temperature a loss of illuminating power is incurred, chiefly from a deposit of the light-giving carbon elements of the gas.

* Abstracted from the Report of the Gas Referees.

But at any heat which does not thus alter the constitution of the gas, the only result of raising the temperature must be to increase its volume by expansion; and the effect would be that, if the gas were heated *after* it has passed through the meter, and the meter were made to pass a fixed quantity, then the heated gas, being enlarged in volume, would have to pass *more quickly* through the burner than if it were of the same temperature as it had when passing through the meter.

The question is one of considerable importance as regards the construction of burners; and two opposite views have been held on the subject,—the Leslie burner having been devised on the theory that the gas should be heated as much as possible before being ignited; while Mr. Sugg and others, more recently, adopt the opposite opinion, and make their burners, in whole or in part, of non-metallic substances, in order (*inter alia*) that the gas may be heated as little as possible. In order to test the accuracy of the results obtained at Munich, and, generally, to ascertain correctly what effect (if any) temperature has upon the illuminating power of gas, the referees made the following series of experiments (the temperature of the room being about 65°):—

A 12-ft. coil of half-inch metal pipe was placed in a water-bath; a metal pipe 18 inches long led from the top of the coil to the burner; and midway between the coil and the burner a thermometer was inserted in the pipe, in such a manner that the gas passed over the bulb. The water was then raised to the boiling-point (212° F.), but the thermometer only rose one or two degrees and remained stationary. Oil was then used instead of water, and the coil was lengthened from 12 to 56 feet; nevertheless, when the oil was raised to its boiling-point (about 400° F.), the thermometer in the gas only rose to about 79° F. Inferring (as will appear, too hastily) from this that the gas, in passing through the coil, failed to absorb the heat from the surrounding oil, large shot were introduced into the coil of pipe, in order to conduct the heat inwards, and bring the gas at all points in contact with heated metal. Even then the thermometer hardly showed any further rise of temperature; but it was incidentally observed that the quicker the gas was sent through the pipe, the greater was the rise of the thermometer,—although, of course, the gas was then for a shorter time in contact with the heated metal.

This fact at once showed that the stationary position of the thermometer was not so much owing to a difficulty in heating the gas in the coil, as to the rapidity with which the gas lost the heat so acquired, after leaving the coil. Accordingly, in the subsequent experiments, the pipe leading from the coil was surrounded by a jacket filled with boiling oil, and extending to within 2 inches of the point of ignition,—the thermometer being again placed between the coil and the burner. The effect of this change in the apparatus was that the thermometer at once rose to 296° F., the temperature at which, according to the experiments made at Munich, produced an increase of illuminating power to the extent of 18 per cent. An apparatus was then so constructed that the burner could be supplied instantaneously with cool and heated gas alternately, and any change of illuminating power, produced by a high or low temperature of the gas, could be readily noticed. But *the heated and the cool gas gave exactly the same amount of illuminating power.*

Indeed the heat acquired by gas immediately upon ignition is so great—the heat of a Bunsen-flame being estimated at about 1800° C. (3272° F.)—that the highest temperature at which it is practicable to supply gas to a burner is quite insufficient to make any appreciable difference in the temperature of the gas-flame. As a deduction from these experiments, the referees express an opinion that the advantages claimed for various materials used in the manufacture of burners are wholly imaginary, except that non-metallic substances are likely to be more enduring, inasmuch as they are not so liable to oxidation as metal.

As to the effects of cold upon the illuminating power of gas, it is reported that in the experiments made at Munich, when the U-tube was immersed in snow, so as to bring the temperature of the gas down to 32°, the illuminating power fell from 100 down to a point varying from 75 to 86; in other words, the light was reduced on the average to the extent of 20 per cent. And when the temperature of the gas was still further lowered, by using a mixture of salt and snow (temperature 4 below zero), the illuminating power was reduced by nearly one-third, ranging from 33 to 40, as against its full illuminating power of 100.

The latter temperature (− 4° F.) is one to which, in this country at least, gas as supplied to the public is never subjected; but as regards gas at the freezing-point (32° F.) and a little below it, the referees' experiments showed that this reduction of temperature made no difference in the illuminating power, gas at the freezing-point, and at a temperature of 296° F., being supplied alternately to the burner without making any difference in the readings of the photometer. At the same time it must be said that when gas is subjected to a freezing temperature for some time, a considerable decrease of its illuminating power will certainly occur; for in such a case a change will be produced in the constitution of the gas. Just as a very high heat alters the composition of gas, greatly diminishing its illuminating power; so will extreme cold from a kindred cause produce a similar result. In the former case, there is a disintegrating chemical effect produced by excessive heat, occasioning, *inter alia*, a deposit of carbon; in the latter there is the effect of freezing, by which the water contained in gas, in the form of aqueous vapour, is separated from the gas in the form of ice, and a portion of the illuminating hydro-carbons are condensed along with it.

It may be observed, as a matter of fact, that in street lamps (where the gas is fully exposed to the effects of temperature) there certainly is a marked diminution in the illuminating power during a severe frost. The experiments, however, were specially directed to determine whether a mere cooling of the gas (apart from the alteration of its constitution by the freezing of its aqueous vapour) produced any loss of light-giving power; and it was found that it did not,—the result of the experiments made by the referees entirely conflicting with that obtained in the laboratory at Munich.

Advantage was taken of the recent opening of the Chartered Gas Company's works at Beckton, to attempt to ascertain whether the distance of the point of manufacture from that of consumption had any effect upon the illuminating power, the gas produced at the Beckton works having to travel nearly nine miles to the Brick Lane station of the above company. This point is not yet definitively settled, but the present evidence tends to show that no appreciable injury occurs to the gas in its long passage. This is a very important question, and the answer given to it by further investigation will determine whether the existing legislation as to the position of the official testing-stations (namely, at 1000 yards from the gas-works) is adequate security for the interests of the public.

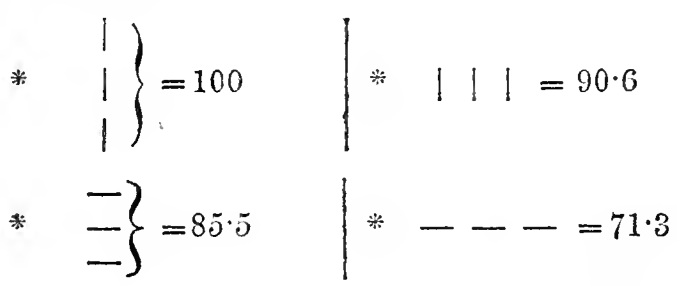
The last subject treated upon by the referees in this report, viz. the transparency of gas-flames to light, is one of considerable importance, bearing as it does upon the effective and economical arrangement of burners. If a gas-flame offers no obstruction to the light of other gas-flames or to a part of itself, then it matters not how the burners are placed or arranged; but if it does impede the transmission of light, then burners should not be arranged in such a manner that the light from one of them has to pass through that of the others,—or even through a part of itself, as happens when a batwing or fishtail burner is placed edgeways to the point of sight.

To determine this point,—namely, the transparency of gas-flames to the light of other such flames,—the following experiments were made in the laboratory of the referees:—

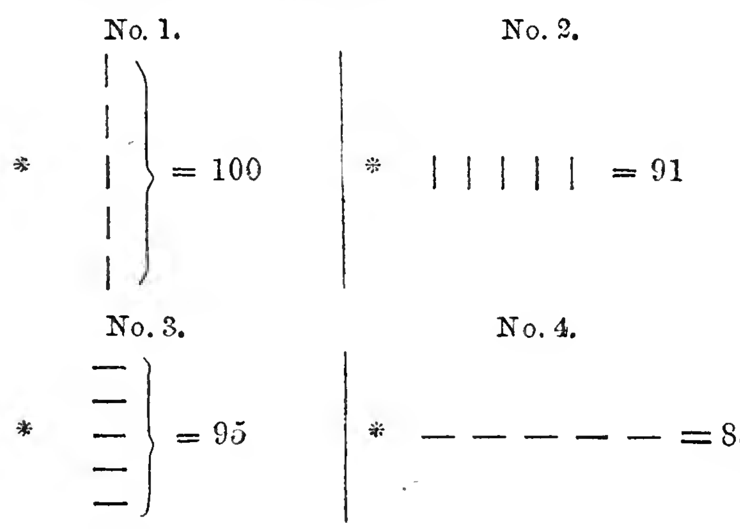
Three flat-flame burners (Sugg's No. 7 batwings) were fixed two inches apart on a stand, consisting of a piece of tubing, in such a manner as to allow the positions of the flames to be changed without altering the consumption of gas, and with the central burner always remaining at the same distance from the photometer disk.

The illuminating power was first determined by placing a stand at a right angle to the point of view (or to the photometer bar), and with the flat side of each flame exposed to the photometer disk, so as to allow the light from each burner to pass to the disk without any obstruction. The number thus obtained was taken as 100. The stand remaining in the same position as before, the burners were turned half round, so as to present the edge of the flame to the photometer. The illuminating power was again determined, and found to be only 85·5, showing a loss of 14·5 per cent. The stand was now placed in a line with the photometer bar, the flat side of the flames being exposed to the disk. In this position the illuminating power was 90·6, showing a loss of 9·4 per cent. The burners were then turned half round, bringing the flames in a line with the photometer-bar and edgeways to the disk. In this position the illuminating power was only 71·3, the loss being 28·7 per cent.

The following rough diagram will perhaps show, more clearly than a verbal description, the effect of the several arrangements of the gas-flames (marked —) upon the amount of light received from them on the photometric disk, marked *:—



A similar set of experiments were made, at Mr. Sugg's works, with five fishtail burners (Sugg's No. 6) placed $2\frac{1}{2}$ inches apart, the consumption of each burner being regulated, as in the previous experiment, to a uniform quantity by means of a separate governor. The results are shown in the following diagram:—



In this experiment the loss of light from obstruction appears less than in the former one, instead of greater, as it ought to have been when more burners were used. But, owing to the greater length of the stand upon which the burners were fixed (10 inches instead of 4), the light from the outer burners in the second experiment, when placed in a line at right angles to the photometer-bar, falls only indirectly on the disk; so that the illuminating power in position No. 1 ought to be reckoned higher than the actual reading of the photometer as given in the diagram. And in position No. 3 the illuminating power ought to be reckoned as lower, in consequence of the outer burners giving their light not really from the edge of the flames, but partly from their sides. Accordingly, although fewer burners were used in the first experiment than in the second, the photometric results obtained from the former may be regarded as more correct than those given by the latter.

From both of these experiments, however, it appears conclusively that gas-flames are not perfectly transparent, and considerably obstruct the light of other such flames placed behind them. Also, the loss of light by such obstruction was greatest when the flames were placed edgeways to the photometer, in which position the depth of flame through which the posterior light had to pass was greatest.

MEDICATED WATERS.

BY R. ROTHER.

This apparently unimportant subject has been under discussion by many commentators, especially those of Europe, and closer scrutiny of it reconciles the opinion that further study in its behalf is obviously justifiable. Most of the medicated waters, particularly the aromatic, were formerly directed to be prepared by distillation, and at the present day it is the only authorized method in most of the states of Continental Europe. The United States Dispensatory, in its comments upon the subject, sets forth the disadvantages of the method by distillation and the resulting products as compared to our simple and more expeditious officinal method, and the more satisfactory character of its results.

Yet, notwithstanding the superior elegance of the United States' officinal process, the use of magnesium carbonate for this purpose is open to a fatal objection, owing to the circumstance that magnesium carbonate is not insoluble in water. The Dispensatory states that the alkaline character of the water thus acquired decomposes the salts of morphia, mercury and silver by precipitating their insoluble bases, and that eventually a part of the magnesium carbonate itself separates.

By reason of the viscid flakes that separate from some medicated waters thus prepared, and the heavy crusts of magnesium carbonate which by time deposit from all, it is probable that either a portion of the magnesium hydrate, of which the officinal magnesium carbonate is largely composed, is first dissolved by the water and subsequently again precipitated as carbonate by absorption of carbonic acid, or that by the use of cold water a greater amount of magnesium carbonate is dissolved, which again deposits as the temperature of the water rises, or that the acidity of some oils which are not fresh causes the temporary solution of the magnesium compound. The object of the magnesium carbonate is to effect the solution of the volatile oil by presenting it in a finely divided condition to the utmost available action of the solvent. Other insoluble solids are occasionally employed to meet the same end, and the supposition prevails that such a procedure alone, aside from distillation, will ensure a saturated solution. The Dispensatory in this connection refers to the older method of the Dublin Pharmacopœia as being totally insufficient in comparison, since this consisted simply in agitating an alcoholic solution of the oil with water, whereby it is thought but a very feeble impregnation of the water is effected; and furthermore, that the minute quantity of alcohol thus introduced was objectionable *per se*, aside from the fact that it is liable, by the high degree of dilution, to pass into the acetous fermentation and render the water sour. However, no medicated water of any kind should be kept so long on hand as to become deteriorated by time; the simplicity of the modern processes admits of no apology for that.

The most perfect and convenient process by which the division of the volatile oil can be secured so as to expose the greatest possible surface to the contact of the solvent, is beyond dispute the method of precipitation, and this is performed by dissolving the oil in alcohol, and agitating the solution with a large volume of water. The requisite quantity of alcohol in any case need not exceed four times the volume of the oil; and although there exists a marked difference in the solubility of volatile oils in water, a solution of one minim in two fluid ounces of water can invariably be obtained; but frequently much more will dissolve, and therefore an excess of oil should always be used to make a saturated solution.

The writer's process for the aromatic waters, with the exception of camphor water, consists in using the officinal quantities of oil and water, together with four times as much alcohol as volatile oil. It is performed by dissolving the oil in the alcohol, and pouring this into an appropriately-sized bottle two-thirds full of distilled water. The mixture is now violently shaken for a few minutes, and the solution passed through a filter previously moistened with water.

The writer finds that the officinal quantity of camphor is much too great for the prescribed quantity of water. It is a grand mistake to assume that one pint of water dissolves fifty grains of camphor, which the Dispensatory distinctly states. The writer finds, by gradually adding an alcoholic solution of camphor to a measured quantity of water, that one fluid ounce of it, at the ordinary medium temperature, will dissolve nearly three-quarters of a grain of camphor, and that ice-cold water will dissolve nearly 20 per cent. more. The superior solvent power of cold water upon camphor can be very forcibly exhibited by agitating an excess of camphor previously dissolved in alcohol with ice-cold water, and filtering into a bottle until this is so full as to safely admit the insertion of a cork. The bottle is now securely closed and set aside. As the temperature of the water rises, the camphor begins to separate abundantly in shining crystals, which remain suspended until the water has reached the normal temperature, when, at the end of twelve hours, they will have mostly collected on the narrow surface of the liquid.

The writer makes camphor water by dissolving thirty grains of camphor in two fluid drachms of alcohol, pouring this solution into two pints of water, agitating for a few minutes in a bottle, as above directed, and filtering.

Chlorine water is a very unstable preparation. It should always be either fresh or quite recently prepared before use. But as the United States officinal process is not an extemporaneous one, and as the preparation is but rarely used in some localities, it becomes very difficult for pharmaceutists to furnish, at all times, chlorine water of the officinal strength.

Chlorine water rapidly deteriorates when exposed to light, or in partially filled bottles, by abstracting the hydrogen of the water and forming chlorhydric acid. An extemporaneous process would therefore be very desirable. A method of this kind is much in use, and, although the product may be equally efficient, it nevertheless is not by any means chlorine water in the officinal meaning of the term. In this process potassium chlorate is acted on by chlorhydric acid, and the deep yellow solution diluted with water; the result is mainly a solution of a mixture of the lower oxides of chlorine and probably free chlorine. The writer has long employed an extemporaneous process which yields a solution of pure chlorine, containing however sodium chloride, which is not an objectionable impurity. The method consists in the use of the officinal solution of chlorinated soda, chlorhydric acid and water. The officinal solution of chlorinated soda is a mixture of sodium hypochlorite, disodic carbonate and sodium chloride in aqueous solution. When brought in contact with chlorhydric acid, the sodium carbonate is first converted into sodium chloride with evolution of carbon dioxide, and, secondly, the sodium hypochlorite is decomposed into free chlorine and sodium chloride. The process is conducted by pouring into a quart bottle four fluid ounces of solution of chlorinated soda previously mixed with twelve fluid ounces of water, and then diluted chlorhydric acid by gradual addition, until, firstly, the carbon dioxide has been liberated and expelled; and, secondly, the available chlorine has all been set free and absorbed by the water, aided by frequent agitation. This product seems to be more permanent than the officinal article, as it retains the powerful odour of chlorine for a considerable time, even in bottles partially filled, if they are kept cool and excluded from the light.—*The Chicago Pharmacist.*

A NEW THEORY OF FERMENTATION.

BY A. PETIT.*

An attentive study of the phenomena of fermentation has led the author to propose a new theory, based on the following facts:—

1. Ferment globules may be produced without fermentation.

2. Fermentation may take place, as has also been shown by Berthelot, in the absence of ferment globules.

3. In a filtered fermentable liquid, globules form without inducing fermentation. It commences only when a certain number of globules are deposited at the bottom of the vessel, the bubbles of carbonic anhydride then proceeding exclusively from the bottom.

4. Fermentation is retarded, and even stopped, when the sugar is in very dilute solution.

5. By augmenting the relative proportion of ferment, the resistance which certain anti-fermentescible substances, creasote, sublimate, organic and mineral acids, oppose to fermentation may be overcome.

6. When the proportions of ferment and sugar are suitable, fermentation commences instantaneously.

7. By varying the sugar within very wide limits (from 20 to 300 grms. per litre in the author's experiments), the volume of gas disengaged is the same for the same quantity of ferment.

8. After a certain time, necessary to attain a maximum, the quantity of gas disengaged is exactly proportional to the time.

9. Sulphites do not prevent fermentation; they are converted into sulphates.

10. Beer-yeast suspended in water absorbs a certain quantity of iodine, converting it into hydriodic acid. This liquid saturated with iodine can, after fermenting some time, again absorb a further quantity. In presence of yeast, water is thus decomposed, the hydrogen uniting with the iodine, the oxygen with the globules. This property of the globules of absorbing oxygen has, moreover, been thoroughly established in the case of the blood-corpuscles and the acetous ferment.

On these observations the following theory is founded. The sugar being dissolved in water in presence of yeast, water becomes decomposed, and hydrogen and oxygen are set free. The oxygen enters, momentarily at least, into combination with the substance of the globules; the hydrogen in the nascent state attaches itself to a molecule of sugar, and causes its decomposition, the products being alcohol, carbonic anhydride, and one equivalent of hydrogen, which decomposes a further molecule of sugar, and so the reaction proceeds:—

$$C_6H_{12}O_6 + H = 2\,C_2H_6O + 2\,CO_2 + H.$$

A single molecule of hydrogen should theoretically decompose an indefinite quantity of sugar, were it not that secondary reactions occur, the principal of which consists in the formation of glycerin:—

$$C_6H_{12}O_6 + 4\,H = 2\,C_3H_8O_3.$$

The author was led to consider the hydrogen the prime agent—although the oxygen may equally well be so regarded, and nothing proves that under certain con-

* Compt. Rend. lxxiii. 267–270, from the *Journal of the Chemical Society.*

ditions of experiment it is not so—by the fact that on allowing two similar liquids to ferment, but with the addition of 1 per cent. of sodium sulphite to the one, the same disengagement of carbonic anhydride took place in both cases, although the oxygen had served to convert the sulphite into sulphate. In this experiment no acids were formed.

If the fermentation takes place in the absence of sulphites, the oxygen forms succinic and acetic acids.

CARBOLIC ACID IN THE POWDER FORM.

Professor C. O. Curtman, in a communication to the *American Journal of Pharmacy*, refers to the inconvenience sometimes arising from the corrosive action of concentrated solutions of crude carbolic acid, and says that a preparation in which a dry argillaceous powder is used instead of water as a diluent of the acid, has some very decided advantages over the common solutions. The powder as used by him is quite dry, has very little coherence, is light and porous, little inclined to form lumps by exposure to moisture, and contains about 20 per cent. of the mixed tar acids, which gradually and slowly volatilize when the powder is exposed to the air.

In order to ascertain whether the corrosive qualities of the acid were modified without sacrificing any valuable quality, Professor Curtman made some experiments upon a number of shrubs and flowers in his garden which had become infested by swarms of various parasites. Selecting a rose-bush upon which thousands of green insects were preying, he attempted to destroy them by syringing the plant with a quarter per cent. solution of crude carbolic acid. The experiment was unsuccessful until the solution had been increased in strength to four per cent., when some of the insects died, but the rose-bush also began to wither, and after a few weeks of sickly existence perished. Similar results were obtained in other experiments.

The powder containing about twenty per cent. of the acid was next sprinkled slightly over different plants. On the first day neither plants nor insects appeared to be affected, but after three days very few parasites remained on the plants, while no damage whatever had occurred to the plants.

Professor Curtman considers that in the use of carbolic acid the continuous and regular exhalation of the acid vapour from the finely divided surface of the powder is preferable to its more irregular diffusion resulting from the evaporation of an aqueous solution, and that in inexperienced hands the pulverulent preparation is much safer than solution in liquids. He recommends clay as preferable to other substances for this purpose, on account of its entering into no combination with the acid, but acting simply as a neutral, inert, mechanical diluent.

SYRUPUS ASSAFŒTIDÆ COMPOSITUS.

In the *American Journal of Pharmacy*, Mr. J. J. Rambo publishes a formula that he has for a number of years been in the habit of preparing, to obviate the great objection felt by most patients to the disagreeable smell and taste of assafœtida, which has prevented to a great extent the more general use of this valuable drug. The formula he has found to answer the purpose effectually, at the same time he considers that its medicinal qualities are enhanced by combination with syrup of wild cherry, thus presenting the valuable therapeutic properties of both.

℞ Infusi Pruni Virginianæ Oj
Assafœtidæ ℥j
Sacch. Albi ℥xxiv
Magnes. Carb. ℥ij.

Rub the assafœtida and magnesia, with the infusion gradually added so as to make a uniform mixture, and filter; to this, transferred to a bottle, add the sugar, and agitate occasionally until it is dissolved. The result is a handsome syrup, which does not differ in appearance from the syrup of wild cherry.

The property possessed by the volatile oils of bitter almonds, cherry-laurel leaves, bark of wild cherry, etc., containing hydrocyanic acid, of removing the odour of assafœtida has long been known, and advantage taken of this property by M. Maheir, a French pharmaceutist, to remove the odour from mortars and bottles with which it came in contact; but Mr. Rambo is unaware that the fact has ever been applied to its administration as a medicinal agent.

PRESENTATION OF A TESTIMONIAL TO A PHARMACEUTICAL CHEMIST.

On Thursday, September 9th, a very interesting ceremonial took place, in the Town Hall, at Reading, on the occasion of the presentation of a very handsome testimonial to Mr. Peter Spokes, Pharmaceutical Chemist, the late mayor. It consisted of a chaste dessert-service and silver inkstand. The dessert-service comprised a very handsome epergne, or centre-piece, twenty-one inches high, with a tripod-panelled base, with vine leaves and grapes, twisted vine-stem and trellis-basket supporting a rich cut-glass bowl. The figures on base are two boys sporting with a goat. The four dessert-stands to match, are $13\frac{1}{2}$ inches high, with figures representing the four seasons, viz. Spring, girl and lamb; Summer, boy feeding hen and chickens; Autumn, girl and goat; Winter, shepherd boy and dog. Each piece bears the following inscription:—"Presented to Sir Peter Spokes, Knight, Mayor of Reading, November 9th, 1871, by his fellow-townsmen, as a token of their respect, and of their cordial approval of the efficient manner in which he has discharged the duties of the Mayoralty during two successive years, 1869–70, 1870–71." The inkstand is 12 inches long, of Elizabethan style, with two cut-glass inks; hexagon wafer-box in centre, surmounted by a figure of "Justice," with scales, richly engraved in the style of the period. The inkstand bears the following inscription:—"Presented, together with a silver dessert-service, to Sir Peter Spokes, Knight, Mayor of Reading, November 9th, 1871, by his fellow-townsmen, as a token of their respect and of their cordial approval of the efficient manner in which he has discharged the duties of the Mayoralty during two successive years, 1869–70, 1870–1871."

The testimonial was presented by the Rev. A. P. Perry-Cust, who said that, although he differed from Mr. Spokes in religious and political opinions, he was happy to be able to bear his testimony to the able manner in which Mr. Spokes had fulfilled the duties of his office, especially on the occasions of the installation of a new High Steward of the borough and the laying of the first stone of the new grammar-school by the Prince of Wales. He also congratulated him that upon his retirement from the mayoralty, he carried with him the stamp of her Majesty's approval in the offer of knighthood that had been made to him.

Mr. Spokes returned thanks in a feeling and eloquent speech.

Mr. Shaw-Lefevre, M.P., also congratulated Mr. Spokes upon the success with which he had performed the duties of Mayor for the last two years. He said that he had seen the letter written by the Prince of Wales to Mr. Gladstone, asking him to advise her Majesty to confer the honour of knighthood upon Mr. Spokes, and that it referred in high terms to the enthusiasm and loyalty with which the Prince was recently received at Reading.

The Pharmaceutical Journal.

SATURDAY, NOVEMBER 18, 1871.

Communications for this Journal, and books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*
Instructions from Members and Associates respecting the transmission of the Journal should be sent to ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*
Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE DUTY ON CHLORAL HYDRATE.

THE consumption of chloral hydrate bids fair to be as fruitful a topic for the sensational writers at this dull season of the year as was the case of strychnine in 1850, when the statement was made in a French newspaper that M. Payen in one of his lectures had said that much of the strychnine made in Paris was sent to England for the manufacture of bitter beer. To this day many people are credulous enough to believe this nonsense, and would be offended with those who differed from them in opinion on this subject. Now, up to the present time no satisfactory proof whatever has been adduced that chloral has been ever used in beer; and, however attractive sensational articles and letters may make the newspapers containing them, it is not fair either to the brewers of beer or to the public that such liberties should be taken with our national beverage.

To those who constantly have to analyse beer, such wild statements are known to be untrue; and it may be broadly stated, without fear of contradiction, that beer is seldom adulterated with hurtful materials, but the adulteration generally consists in diluting with weaker beer or with sugar and water, in order that the beer sold may yield a larger margin of profit than would otherwise be obtained. We are not advocates even of harmless dilution, but condemn sophistication in every shape and form, and hope the day is not distant when by legislative enactments the Government will undertake the responsibility of suppressing the adulteration of food, drink and drugs.

Although no reliable statistics can be given, we believe that both the quantity of chloral hydrate imported and its consumption in this country have been very much over-estimated, and we may be quite sure that the Customs duty now imposed upon it of 1*s.* 3*d.* a pound will decrease the consumption, and also divert the manufacture from Germany to England. The absence of competition will probably tend to increase the price; and if the price be increased, it may in the end prove a means of causing the chloral to be used in a more legitimate manner than it otherwise would be.

The mention of the imposition of this duty brings us at once to the real subject-matter of this article, which is, why was this duty imposed? From inquiries we have made on the subject, and from the clause in the Act imposing the said duty, the facts appear to be these. A certain amount of alcohol has to be used in the preparation of the chloral hydrate, the chloral is therefore chargeable with a duty "equivalent to that which is chargeable on the like quantity of spirit on its importation." The duty on alcohol imported is 10*s.* 5*d.* per gallon at proof strength, and as a gallon of such spirits weighs $9\frac{2}{10}$ lb., it follows that according to the duty imposed it has been found that $1\frac{1}{10}$ lb. of proof spirit is required to produce 1 lb. of chloral.

The very heavy duty on alcohol in this country—which produces an annual revenue of not less than fifteen millions per annum—has a tendency to restrict all manufactures in which alcohol is used, and it is only by countervailing duties levied on similar articles imported from abroad, that our manufacturers are able to hold their own even in this country. It is true that the Methylated Spirit Acts have set free many branches of industry in this country which otherwise could never have been successfully carried on, but these remarks only apply to the manufacture of such goods as are not deteriorated by the offensive odour of methylated spirit.

In pharmacy methylated spirit ought never to be used; and, to the honour of those who were consulted on behalf of the Pharmaceutical Society, it is recorded that they were strongly opposed to allowing methylated spirit to be used in the preparation of medicine of any kind. It is well known that the first of the methylated spirit Acts were grossly abused, and that the preparation from methylated spirit of medicines for internal use was so common, and found to be such an extensive fraud on the Revenue, that eventually legislative action had to be taken in the matter, and it was made illegal to prepare medicines for internal use from methylated spirit. In this Act, however, exception was made to chloroform and ether, on the ground that these substances, when properly prepared, would not contain alcohol of any kind. But we know from experiment that there is little difficulty in determining whether a sample of chloroform or ether is made from pure alcohol or methylated spirit, and this fact at once shows the difficulty there is in practice in getting rid of the offensive hydrocarbons and other impurities which are always present in methylated spirit. Doubtless if chloral had then occupied as prominent a place in public estimation as it does now, it would also have been put in the same category as ether and chloroform, and when prepared from methylated spirit it would, no doubt, as easily betray its origin when submitted to chemical treatment as do the other two substances named.

As before stated, the heavy duty on chloral will probably tend to check its general use, but, however objectionable this may be, our home manufacturers have cause for congratulation that their interests are protected, although the general body of pharmaceutists will have to suffer for the change in the law by having to pay a higher price for their goods, and will also in many instances have imposed on them methylated chloral for the genuine article, as the difference in price will be a strong inducement to unprincipled manufacturers to substitute the cheap for the dearer kind.

In studying this question, there appears to be but one way of getting rid of the duties on such necessary preparations as chloral, chloroform and other substances that cannot be prepared without alcohol, which is, that these goods, when manufactured in this country, should be made in bond from duty-free spirit. Many difficulties surround the subject, and we are not prepared to speak confidently of the practicability of this suggestion, knowing the subject is such a wide one. If it were granted by the Treasury, the Customs authorities would, in order to protect the spirit revenue, certainly have to impose stringent regulations on those manufacturers who availed themselves of the privilege. Still, the concession would be the means of increasing honest competition, which always proves to be of great benefit to the public, and it would also give our manufacturers opportunities of making original experiments with duty-free spirit, which they cannot now afford to do with that which is duty paid.

THE APPLICATION OF THE PHARMACY ACT.

A short time since we called attention to the fact that under the Pharmacy Act, 1868, any one has the power of proceeding against persons who deal illegally in poisons, and we suggested that if those who are injured by such illegal dealing would study the provisions of the Act, they would see how easily they could protect themselves by its aid. But our remarks have received a rough commentary in a case reported in another part of this Journal; and if the decision of the magistrates,—who appeared on this occasion to understand the provisions of the Act,—is to be taken as a specimen of what will be done in similar cases, the Pharmacy Act, so far as the sale of poisons is concerned, will become a dead letter. In this case a sale of oxalic acid insufficiently labelled was proved, and admitted by the defendant, and very properly a fine was inflicted for the offence; but we are utterly at a loss to conceive why the complainant should have had to pay the costs; the penalty thus practically falling upon him. If it come to be understood that in addition to the trouble, those who endeavour to perform a public duty are to be put to considerable expense, we fear that the sale of poison will go on without any attempt to enforce the present legal restrictions.

It is curious, in the presence of such difficulty in carrying out what is now the law of the land, to meet with so much vague declamation as to the duties of pharmaceutists in regard to the sale of poisons. An addition to the many published instances of it from persons who might have been expected to be better informed, will be found the following quotation from a paper by Dr. John Spencer Ferris, of Uxbridge, in the *British Medical Journal*, concerning some anomalous symptoms in a case of morphia poisoning, where he says:—

"The twenty-five drops of morphia were dropped out of a four-ounce bottle, labelled 'Solution of Muriate of Morphia, ten to sixty drops per dose,' obtained from a chemist in Reading, so that I cannot exactly tell the strength, more especially as these were almost the last drops in the bottle, and very probably there was some undissolved alkaloid in them. How is it a chemist, now that the Pharmacy Act has come into operation, dares to sell to an unprofessional person four ounces of morphia solution?"

The writer's difficulty as to the strength of the solution betrays an ignorance of the Pharmacopœia that is balanced by his ignorance of a pharmaceutist's duty under the Pharmacy Act.

Another illustration of the incorrect ideas upon this subject, current even among those connected with pharmacy, has recently come under our notice. Upon a gentleman who is in business, but not on the Register of Chemists and Druggists, being informed that he must take steps to place himself upon the Register if he purposed to continue in business, he replied, that he had been registered many years since, when he had taken up his freedom of the City of London, and that proof of his statement might be seen at the Chamberlain's office.

MUNICIPAL HONOURS TO PHARMACEUTISTS.

We record in another column a very interesting ceremonial, the object of which was to do honour to a pharmaceutist, and one of the Local Secretaries of the Pharmaceutical Society, in the person of Mr. Peter Spokes,—or, as he now is virtually, and by the exercise of her Majesty's prerogative soon will be actually, Sir Peter Spokes,—of Reading. In addition to this gratifying testimony to the municipal worth of a member of the pharmaceutical body, we are enabled to state that the following gentlemen were recently elected to the mayoralty of their respective towns:—Mr. E. Bagott, Chemist and Druggist, Dudley; Mr. T. Deighton, Pharmaceutical Chemist and Local Secretary, Bridgnorth; Mr. John Irving, Chemist and Druggist, Carlisle; Mr. Robert Payne, Chemist and Druggist, Wallingford; Mr. John Slater, Chemist and Druggist, Beaumaris; Mr. Robert Walker, Pharmaceutical Chemist and Local Secretary, Maidenhead.

In the opening columns of our Journal this week will be found an article on the question, "Shall the Pharmaceutical Society Cease to be an Educating Body?" which we recommend to the careful attention of our readers, as illustrating the views held in some quarters upon the subject. At the same time we would suggest that members who have thought upon the question and hold decided opinions concerning it, should communicate them, in order that the topic should be discussed with the fulness that is due to its importance.

Transactions of the Pharmaceutical Society.

EXAMINATIONS IN LONDON.

November 15th, 1871.

Present—Messrs. Allchin, Barnes, Bird, Carteighe, Cracknell, Davenport,*Edwards, Gale, Garle, Haselden, Ince, Linford and Southall.

MAJOR EXAMINATION.

Three candidates were examined; *one* failed, the following *two* passed, and were declared duly qualified to be registered as

PHARMACEUTICAL CHEMISTS.

*Hughes, James..............Swansea.
Peters, David ....Llandilo.

MINOR EXAMINATION.

Thirty-two candidates presented themselves; *ten* failed, the following *twenty-two* passed, and were declared duly qualified to be registered as

CHEMISTS AND DRUGGISTS.

*Hanbury, Frederick Janson ..London.
*Druce, George Claridge ......Northampton.
*Hyne, Harry ....Bristol.
Equal { *Breckon, Hugh Scott........Whitby.
Equal { *Woolldridge, George ....Birmingham.
Herbert, John..............Kingston-on-Thames.
Hooper, William ....Croydon.
Ormond, Richard ....Pembroke.
Salter, Thomas ....Bradninch.
Hicks, William Thomas ......Ipswich.
Laugher, William ....West Bromwich.
Mason, Jonathan ....Workington.
Bright, John Valentine ......Bath.
Warner, George Henry Quibell March.
Jessop, John Arthur ....Willenhall.
Squirrell, John Newton ......Manchester.
Jones, Owen ....Llangefni.
Squire, Thomas ....Great Torrington.
Davison, John ....West Hartlepool.
Bennett, John Henry ....Cheltenham.
Walsh, Albert ....Richmond.
Greasley, John..............Borrowash.

The above names are arranged in order of merit.

PRELIMINARY EXAMINATION.

Certificates were received from the undermentioned in lieu of this Examination:—

Luff, Arthur Pearson ....Old Brompton.
(Certificate of College of Preceptors.)
Trubshaw, Charles ....Dudley.
(Certificate of the University of Cambridge.)

* Passed with honours.

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

The Second General Meeting of this Society was held on October 26th; the President Mr. E. Davies, F.C.S., in the chair.

Messrs. John Sumner, Frederick Pott and Henry Huskisson de Witte were elected members, and Mr. James Walmsley Hargreaves was elected Associate of the Association.

The following donations were announced:—current numbers of the Pharmaceutical Journal, the New York Druggists' Circular, the Journal of the Polytechnic Society, and a Reprint of Notes on Pharmaceutical Preparations, by Mr. J. Abraham.

Mr. Thomas Williams read a paper "Upon the Manufacture of Alum and its Applications."

The President mentioned the recent formation of coniine artificially, as a remarkable fact, as it was the first vegetable alkaloid which had been so formed. He now entertained more hope that quinine and morphine might be so produced than he did formerly.

Mr. A. E. Tanner said he had always been of the opinion that all the alkaloids would at some future day be artificially produced, and thought that the President had placed too great a limit on the future of chemistry. Mr. Tanner also referring to the subject of the paper which had been read, observed that all samples of alum contained some iron, and instanced the change of colour produced on adding this salt to infusion of roses; an annoyance most pharmacists had experienced.

Mr. Williams explained that pure alum would not certainly affect the colour of the infusion.

A vote of thanks to Mr. Williams for his interesting paper was proposed and carried unanimously.

HULL CHEMISTS' ASSOCIATION.

At the opening of the Session of the School of Pharmacy in connection with the Hull Chemists' Association, on the 26th October, the President, Mr. A. Pickering, delivered the following address to the students:—

Gentlemen,—In commencing the duties of my office as President of the Hull Chemists' Association, to which I have so recently been elected, I think I cannot do better than address a few words of encouragement to the young students I see before me, at the opening of another Session of its School of Pharmacy.

It is now between thirty and forty years since I first entered the trade, and I rejoice to tell you that pharmacy has made considerable progress during that time. Many new and valuable remedies have been added to the Pharmacopœia, and will for ever retain a place there; the morphias and other preparations of opium, quinine and the other preparations of bark; many new preparations of mercury, chloroform, chloral, methylic ether, carbolic acid, cod-liver oil and many others too numerous to mention, but all of them invaluable in the hands of the medical practitioner for the alleviation of human suffering. This list appears likely to be largely increased every year, from the increasing study of the active principles of plants and the state of combination in which they exist in them.

Chemistry, too, is busy forming new compounds not found in nature, and in ransacking and reducing the mineral kingdom for the service of man. Chemistry has made gigantic strides during the last thirty years. Look at the beautiful art of photography with its long list of chemical preparations; see how the oils and fats have been utilized in the forms of soap and candles; how the bowels of the earth have been made to yield their petroleum and paraffin; how coprolites and bones and the sewage of large towns are all, by the magic wand of chemistry, transformed into manures invaluable to the agriculturist. Look at aniline and the other new preparations used in dyeing; at those wonderful flavouring essences so cunningly formed as to give to liquors and sweets the flavour of the raspberry, strawberry, pine-apple and every description of fruit. What valuable new disinfecting agents are now prepared for destroying malaria, contagion and arresting the progress of epidemics; for deodorizing the refuse of towns and rendering them more healthful! It is my own opinion that there is not a disease for which Divine Providence has not provided a remedy, and which will certainly be discovered if we diligently search for it; that there is not anything in creation but will at some time or other be rendered subservient to the use of mankind, and that the great agent which will be employed for that purpose will be chemistry.

The School of Pharmacy has been established for the special benefit of the rising generation of pharmacists. Your lines have fallen to you in pleasant places. Your lot is very different from those who entered the profession thirty or forty years ago. When I first went as an apprentice we commenced the duties of the day at six o'clock in the morning by taking down the shutters, and had the privilege of putting them up at nine o'clock in the evening, and of finally closing the door at ten o'clock. After sixteen hours of labour, I need not tell you, we were truly thankful to fall into the arms of Morpheus. At that time of day all drugs were powdered by mortar and pestle, peppers ground in a hand-mill and paints on a slab with a muller. Quicksilver we used to kill by means of "elbow grease," *by rubbing in a mortar for three weeks together*. The hours of labour were not lessened when I became a retail assistant in London. There we commenced the duties of the day every six out of seven, by going into the shop at seven o'clock in the morning and never leaving it until half-past eleven o'clock at night. This will give you some idea of the few opportunities the old generation of pharmacists had of obtaining a scientific knowledge of their business.

Schools of pharmacy there were none. The only lectures at all bearing on the subject were those delivered at the Medical Schools in London. Most of those whose names have been eminent in pharmacy during the past generation, laid the foundation of their knowledge and their success in life by availing themselves of those lectures. But very few members of the trade were able to do so.

Here, in Hull, you have the means of obtaining a thorough knowledge of your profession. You have the advantage of an exceedingly able lecturer, and everything necessary to illustrate his lectures. Give to him your undivided attention whilst you are here; devote your leisure hours to the study of those subjects on which he lectures. Give your minds and imaginations no time to run riot, thus shall your paths be kept from evil and a glorious future of a useful career await you.

I trust I have done something in my time by example to shorten the hours of toil. So exhausted was I when I left the retail situation in London, that for twelve months I was unable to do anything. Exhausted in body and mind by such excessive toil, I determined, when I commenced business for myself that no one should ever, in my employment, work the same number of hours which I had done. I consider myself the pioneer of early closing in Hull. Ever since I have been in business, have I closed my shop at eight o'clock in the evening, when there was not another in the town that did. I do not mean to say that I do not supply medicines after that hour, but I do not court trade after that hour at the expense of the health, happiness and social comfort of those around me.

There is one other subject I should wish to say a few words on before I sit down. I shall probably never live to see it, but I trust most of you will, when the practice of pharmacy will be entirely separated from the practice of medicine; when there will be a broad line of demarcation between the two branches of the profession; when there will be no longer surgeons keeping open druggist shops and surgeries, as so many do in London; when there will be no more prescribing druggists; when each will confine themselves to their respective branches of the profession; when each branch will unite together only for the purpose of discovering new remedies for the treatment and cure of disease and suffering. Probably ninety parts out of every hundred of the medicine used in this country is sent out of the surgeries of medical practitioners and the dispensaries, infirmaries and other public institutions. This compels the great majority of the chemists and druggists of this kingdom to deal in a multiplicity of articles which are not drugs, but this they are compelled to do or to starve. I cannot help thinking that if the two branches of the profession were entirely separated, and there were only prescribers and dispensers, they would both be great gainers in social standing.

MIDLAND COUNTIES CHEMISTS' ASSOCIATION.

On Thursday evening, November 2nd, Mr. Woodward, B.Sc., of the Birmingham and Midland Institute, gave the first of a series of special lectures on the "Chemistry of the British Pharmacopœia" to the students attending the classes lately formed in connection with the Midland Counties Chemists' Association. These lectures are given on the first Thursday in the month, and are in addition to the usual chemistry lectures every Tuesday evening.

Mr. Woodward has not only thrown them open to members of the Midland Counties Association attending the chemistry classes, but also to those attending the Latin and botany classes. It is hoped, therefore, that there will be a good attendance of those for whom the lectures are intended.

NORWICH CHEMISTS' ASSISTANTS' ASSOCIATION.

The following arrangements of classes have been made for the winter session:—

On successive Mondays, Botany, by Mr. P. H. Mason; Materia Medica, Mr. A. J. Caley; Galenicals of the British Pharmacopœia, Mr. J. Goodenough.

On Wednesdays, Chemistry of the British Pharmacopœia, by Mr. E. Nuthall.

It is also intended that three prizes shall be awarded, at the close of the winter session, to those students who shall have made greatest progress in their studies, the test for which will be a *vivâ voce* examination, to be held in April, 1872. The subjects comprised will be those required for the "Minor Examination" (with the exception of practical dispensing).

Those students only will be eligible to compete who shall have attended at least two-thirds of the winter classes.

Mr. A. J. Caley, before entering upon the subjects in which he had undertaken to instruct the members of the materia-medica class, gave the students a short but encouraging address, in which he urged the necessity of real study, and pointed out that the examinations of the Pharmaceutical Society were not to be so easily passed as some of the students appeared to imagine.

Proceedings of Scientific Societies.

SOCIETY OF ARTS.

Dyes and Dye-Stuffs other than Aniline.*

BY DR. CRACE-CALVERT, F.R.S.

Lecture I.

Red Colouring Substances.—Madder.

(*Continued from page* 396.)

Pure alizarine sublimes, at a temperature of 460° F., into pale orange prismatic crystals. When slowly crystallized from an ethereal solution, it forms a hydrate, containing two equivalents of water, which crystallizes in lustrous scales. Cold water dissolves a mere trace of alizarine, but its solvent power increases as the tempera-

* Cantor Lecture, delivered Tuesday, Feb. 7. Reprinted from the *Journal of the Society of Arts*.

ture is raised, as may be seen from the following figures:—

At 212° 100 parts of water dissolve . . . . ·034
At 400° 100 parts of water dissolve . . . . ·820
At 480° 100 parts of water dissolve . . . . 3·160

Alizarine is freely soluble in alcohol, ether, wood spirit, benzole, turpentine, sulphuret of carbon, and glycerine. It is soluble without decomposition in sulphuric acid, even at a temperature of 400° F., and is thrown down unchanged when large quantities of water are added. It is soluble in a warm solution of alum, but insoluble in a cold one. It has been assigned different formulæ by different chemists, the two most generally adopted being that of Dr. Schunck, $C_{14}H_{10}O_4$, and that of Wolf and Strecker, $C_{20}H_{12}O_6$. Alizarine gives a purple colour with a weak solution of caustic alkali, which undergoes no change by the action of air. It yields, with alumina fixed in fabrics, a variety of red and pink shades; with oxide of iron it gives purples and blacks; and, with a mixture of these two oxides, chocolates.

I shall now call your attention to one of the most interesting and important discoveries of chemistry, as applied to manufactures, which have been made of late years, namely, the artificial production of this most important colour-giving principle, alizarine, or of a substance which, if not identical with, has great similarity to it. Messrs. Graebe and Liebermann, and Mr. Perkins, believe in the identity of the artificial product with the natural one. But this is denied by M. Alfraise, on the grounds, first, that the formula given by Messrs. Graebe and Liebermann does not agree with that given by Dr. Schunck, as is shown by the following figures:—

Schunck.	Graebe and Liebermann.
$C_{14}H_{10}O_4$	$C_{14}H_8O_4$

Secondly, that the artificial alizarine does not give the same coloured sublimate as the natural alizarine; and thirdly, that if both these substances are acted on by nitric acid, natural alizarine is converted into phthalic acid, whilst the artificial alizarine, which he calls alizapurine, yields a large quantity of a nitro-compound having an intensely bitter taste, mixed with only a mere trace of phthalic acid. These observations of M. Alfraise have been confirmed by M. Kopp. That the commercial artificial alizarine is not identical with a natural alizarine is rendered still more certain by the researches of Dr. Schunck, who, on examining a sample obtained from Mr. Perkins, found it to contain a large quantity of a compound crystallizing in yellow, silky needles, anthraflavic acid, and which he obtained by treating Mr. Perkins's product with alcohol. On treating the acid with fuming nitric acid he obtained a nitro-compound, the potash salt of which he describes as resembling picrate of potash. This is doubtless the bitter principle which Alfraise obtained, but did not study. Dr. Schunck gives the formula of anthraflavic acid as $C_{15}H_{12}O_4$, and considers it homologous to alizarine, one equivalent of its hydrogen being replaced by methyl. Messrs. Graebe and Liebermann, and Mr. Perkins, found their opinion as to the identity of the two alizarines, on the fact that they give the same absorption bands on being submitted to Professor Stokes's spectrum test.

Artificial alizarine was first made, in 1869, by Messrs. Graebe and Liebermann. The substance from which they obtain it is *Anthracene*, a body discovered by Professor Anderson, of Glasgow. Anthracene is one of the last products passing over in the dry distillation of coal-tar, and is found most abundantly in the 10 or 15 per cent. which comes over from the temperature where soft pitch is formed, and that where hard pitch is produced. The quantity of anthracene in coal-tar varies greatly; it is most abundant in the tars obtained from those coals which yield most naphtha. The South Staffordshire coals give the largest quantity, whilst the Newcastle coals give very little. Its extraction can only be carried on with advantage in cold weather, as it becomes very soluble on a slight rise of temperature in the oily homologues which accompany it. At a temperature of about 40°, the distillate above described is semi-fluid; it is placed in a hydro-extractor, and the oily fluid separates from the solid matter, which is then submitted to cold and hot pressure. The cake thus formed is pulverized and carefully washed with petroleum spirit, having a boiling-point of about 180°, which leaves anthracene moderately pure. This powder dissolved in alcohol and crystallized, yields anthracene in nearly white scaly crystals, or in a fit state for the manufacture of artificial alizarine.

Messrs. Graebe and Liebermann oxidized the anthracene ($C_{14}H_{10}$), by nitric acid, into anthrachinon ($C_{14}H_8O_2$), this being again converted into bibrom anthrachinon ($C_{14}H_6Br_2O_2$), which by fusion with potash is changed into alizarine ($C_{14}H_8O_4$). There are three patents published, and a process, the details of which are kept secret. It is curious to notice that the patent taken out by the above-named gentlemen and Mr. Caro is dated the 25th of June, 1870, while Mr. Perkins entered his on the day following, in which nearly the same processes are described, merely employing different oxidizing agents.

The following is an outline of one of the processes detailed in the specification of Messrs. Caro, Graebe and Liebermann:—One part of anthracene is heated with four of sulphuric acid, of sp. gr. 1·845, for three or four hours, to a temperature of 212° F., and then for an hour at 300°. The mixture is allowed to cool, and to it is added water equal to three times the weight of anthracene taken, and manganese equal to four times that weight. The whole is boiled for three hours, and milk of lime is then added, which gives rise to a deposit consisting of the excess of lime and manganese used, and protoxide of manganese, while there remains in solution a double sulphate of anthrachinon and lime. This solution is now acted on by carbonate of soda in slight excess, carbonate of lime separates, and the salt of soda thus produced is evaporated to dryness. To this solid mass are then added two or three parts of caustic potash or soda and a small quantity of water, and the whole heated under pressure, in suitable vessels, at a temperature of 350° to 500° for one hour, when the anthrachinon is further oxidized and converted into alizarine. Thus anthracene, $C_{14}H_{10}$, gives anthrachinon, $C_{14}H_8O_2$, and this alizarine, $C_{14}H_8O_4$. The alkaline mass, on cooling, is dissolved in water, and sulphuric or acetic acid added in slight excess, when an orange-yellow flocculent substance precipitates, which, when properly washed and dried, is artificial alizarine.

The second colour-giving principle of madder, to which I have referred several times already, is called purpurine, and was also discovered by MM. Robiquet and Colin, in 1828. Although in commerce it is sold as a red powder, as has been mentioned above, still, by heating at a temperature of 480° F., it can be obtained in the form of feathery crystals, of an orange-red colour. It is more soluble in water than alizarine, especially at a temperature of 140° F., and is also soluble in the menstrua already mentioned under alizarine. Further, it gives a red colour with caustic alkali, instead of purple as alizarine. It is soluble in a cold solution of alum, while alizarine is not. When fixed on fabrics, its colours do not stand exposure to light as well as those of alizarine.

Professor Stokes, of Cambridge, has found a most elegant method of discovering and characterizing mere traces of these colouring principles. So delicate is the test, that the colouring matter on one square inch of dyed fabric is sufficient to obtain the results. He treats the fabric with a solution of carbonate of soda, which dissolves the colouring matter. The solution is then introduced into a small tube, which is placed before a slit in the shutter of a dark room. The light which passes through is decomposed by a prism, when a spectrum is produced. The operator will observe that, when purpurine is taken, there are principally two black bands formed by the absorption of light in the green part of the spectrum, having between them a band of green light; whilst alizarine exhibits, on analysis, a band of absorption in the yellow, and another narrower one between the red and the orange.

Professor Schützenberger, by treating commercial purpurine successively with alcohol and benzine, unfolded it into four different substances, to which he assigns the following formulæ:—

	Alizarine	$C_{20}H_{12}O_6$.
1.	Purpuroxanthine .	$C_{20}H_{12}O_6$ or $C_{20}H_{14}O_6$.
2.	Purpurine . . .	$C_{20}H_{12}O_7$ or oxy-alizarine.
3.	Orange matter . .	$C_{20}H_{16}O_9$ or hydrate of purpurine.
4.	Pseudopurpurine .	$C_{20}H_{12}O_9$ or oxy-purpurine.

I shall now call your attention to a very remarkable discovery, recently made by the late Professor Bolley, viz. the conversion of purpurine into alizarine. If purpurine is heated in the atmosphere, as stated above, it is nearly all sublimed, leaving only a small amount of carbonaceous residue, but if heated in sealed tubes, at a temperature of 400°, it forms a carbonaceous mass from which water extracts alizarine. Under the influence of the high temperature, the purpurine loses an equivalent of oxygen, and is converted into alizarine. This reaction appears to confirm the opinion of M. Decaisne, that the madder plant contains only one colour-giving principle, which under the oxidizing influence of the atmosphere becomes converted, first, into alizarine, then purpurine, and afterwards into the still more highly oxidized compounds.

The difficulty and expense experienced by calico-printers in brightening their colours and obtaining pure whites in madder-dyed goods, attracted many years ago the attention of scientific and practical men, and any process by which these difficulties might be overcome was anxiously looked for. The discovery of MM. Robiquet and Collins, that the colour-giving principle was not destroyed by sulphuric acid, was the step in that direction, and led M. E. Schwartz to observe that the carbonaceous mass of Robiquet, if carefully washed and neutralized, could be used as a dye-stuff. MM. Lagier and Thomas improved upon this, and introduced, in 1839, an article which is now extensively used by calico printers and named garancine, and now is prepared as follows:—Madder, either unwashed, or, better still, washed with cold water, is mixed with one-third of its weight of sulphuric acid, which has been previously diluted with water till it marks 10° Twaddle; it is then boiled for four or five hours, and the mixture run on to woollen filters and washed till only a mere trace of acid remains. It is then either removed or washed once with a very weak solution of carbonate of soda, submitted to hydraulic pressure and then introduced into drying stoves. One hundred parts of madder yield from thirty-four to thirty-seven of garancine. Garancine is a fine powder of a light brown colour, and has a dyeing power four times as great as the original madder. It does not give as good blacks as madder, nor are its purple, red and pink so fast, but its purple is brighter, and the whites are obtained pure without soaping, it being only necessary to substitute a slight clearing liquor, composed of an alkaline, hypochlorite of soda, to which is added a small portion of sulphate of zinc.

In 1852, Messrs. Pinckoff and Schunck effected an improvement in the manufacture of garancine, their product being known in England under the name of commercial alizarine; but on the Continent it is better known as *Pincoffine*. Their process consists in submitting ordinary garancine to the action of high pressure steam of a temperature of 300° F., which, whilst it does not act on the alizarine contained in the garancine, destroys two other colouring matters which are present. These Dr. Schunck has isolated and examined, and named *Rubertine* and *Rerantine*. They are of a peculiar resinous nature, and spoil both the whites and the purples, which are fixed along with alizarine in the dyeing process. The employment of commercial alizarine is especially advantageous in the production of purples, which are faster and more brilliant than those produced by ordinary garancine. The cloth also does not require either soaping or cleansing.

M. Pernod has, within the last two or three years, introduced a madder extract, which is at the present time extensively used in Lancashire as a topical colour. This term is applied to a colour which is printed on a fabric, and afterwards fixed by steaming. By this method bright and fast colours are introduced in printed goods, producing much more effective designs than could be effected if the goods had to pass through a dye-beck and afterwards be washed with large quantities of water. Some splendid specimens of this class of printing were to be seen at the last Universal Exhibition, 1867.

To prepare the extract, garancine is lixiviated till completely exhausted, with a nearly boiling solution of sulphuric acid, containing five parts of acid to a thousand of water. On cooling, an orange-red precipitate falls to the bottom of the vessel, which, when collected and thoroughly washed, constitutes an extract ready for use. The products of M. Leitenberger and Messrs. Schaaffer and Lauth may be substituted for this extract.

As the employment of these extracts is the most important improvement recently introduced into calico-printing, I will give the three following recipes for their application:—To produce dark red, take 8 lb. of extract of madder, 4 lb. acetic acid and $1\frac{1}{4}$ lb. starch. Boil these in an earthenware vessel, and, when cold, add to six measures of the above one of acetate of alumina and a very small quantity of Gallipoli oil, say 1 per cent. For a pale red, take 4 lb. of extract of madder, 2 lb. of acetic acid, 10 quarts of gum Senegal water, and 1 pint of acetate of alumina. To obtain a purple, take 1 pint of extract of madder, half pint of acetic acid, half pint of water, and 3 oz. starch; boil, and when the mixture is cool, 5 oz. measure of acetate of iron of 24° Twaddle and 5 oz. of water. To produce a chocolate, proceed as in the last recipe, substituting acetate of chromium for the acetate of iron.

The above mixtures are printed on cloth by means of engraved copper rollers, and are then dried and submitted to dry high-pressure steam for one or two hours, when the colours have become fixed on the fabric. After being slightly soaped, to remove all excess of colour, the prints are stiffened and ready for the market.

Although I have now concluded my lecture on madder as a dye-stuff, and have already exceeded the time allotted to me, I hope you will allow me a few minutes more, to enable me to give an outline of the processes by which madder styles are produced, the more so as there may be some persons present who are not aware how madder and garancine prints, now manufactured in such enormous quantities and in such general use, are produced.

To effect this, the ordinary white calico, as sold in shops, is not sufficiently deprived of its impurities to be employed in madder or garancine styles; it has, therefore, to undergo further bleaching operations. The calico, so extra bleached, is then printed by means of copper rollers, on which the pattern to be produced is engraved. This roller leaves on the calico a red, purple or chocolate mordant; that is, for red, a sulpho-acetate of alumina, or red mordant; for purples, violets and blacks, an impure acetate of protoxide of iron, known in the trade as pyrolignite of iron or black liquor; and for chocolates a mixture of these two mordants.

After this operation the pieces undergo a process technically termed ageing. This was formerly effected by spreading out the pieces and hanging them in a room for three or four days, so that the acetate of alumina might lose part of its acetic acid, and the iron mordant nearly the whole of it, thus liberating the oxide of iron and enabling it to undergo partial oxidation.

Some few years ago, Mr. David Thom introduced a process by which this is effected in twenty minutes; it consists in passing the printed mordanted cloth over rollers fixed in a machine placed in a chamber about twenty feet long, in which a current of air and steam is thrown. The temperature of this chamber must not be below 100° nor above 108°, and the quantity of steam present must be such that fifty yards of calico will take up one ounce of moisture during the twenty minutes it is passing through the chamber. The printer is able to test the state of the chamber by means of wet and dry bulb thermometers. The next operation to which the cloth is submitted is dunging. The process received this name because formerly the calico was passed through a mixture of cow-dung with water. Now, however, silicates or arseniates of soda, mixed with a little chlorate of potash, are substituted. After passing through either of these solutions they are washed and ready to be passed through the dye-beck. This beck contains water, and from five to seven pounds of madder, or one to two and a half pounds of garancine, or commercial alizarine, for each piece of calico to be dyed. The heat of the bath is then gradually raised, by means of a jet of steam, to 180° for garancines or 212° for madders. This operation takes from one and a half to two hours, according to class of goods, style, etc. The fabrics are then washed and passed through a cleansing liquor for garancine or commercial alizarine styles, or soaped twice at 180° when they are dyed with madder.

The most permanent and brilliant colour produced from the rubia plant on cotton fabrics is Turkey red. The details so essential to success in dyeing this colour are kept by each dyer a secret, but I will attempt, as briefly as possible, to give the main features of the process. After the bleaching of the fabric is completed, they are passed through Gallipoli oil, and then exposed to the atmosphere in heated chambers. This operation is repeated several times. The next one consists in passing the cloth through a weak alkaline solution. After this, they go through a solution of acetate of alumina, and then through a bath of a tannin substance. By these processes, no doubt, the fatty acids of the oil combine with the alumina, as does the tannic acid of the tannin matter, helping to fix the mordant in the fibre of the fabric. On being dyed, the goods assume a rich dark red tone, to which brilliancy is imparted by passing the dye fabric through heated soap solutions.

I should occupy too much of your time were I to attempt to enter into the details of the methods by which chemists determine the relative tinctorial powers of roots, madders and garancines, but I may give you a very simple method of detecting ordinary adulterations of garancine by dye woods and tannin matters. Pieces of blotting-paper are dipped into a weak solution of chloride of tin and sulphate of protoxide of iron, and on each of these sheets is sprinkled a little of the suspected garancine. If a dye-wood be present, the chloride of tin-paper will assume a red colour, and, if tannin matter be present, the iron-paper will be blackened.

Parliamentary and Law Proceedings.

Infringement of the Pharmacy Act.

The following report of a case which came before the magistrates at the Croydon Police Court, on Saturday last, is taken from the *Croydon Times* of that date:—

Alfred Harrington, chemist, of Queen's Road, Croydon, was summoned on the information of George Hayward, chemist, of Windmill Road, Croydon, for selling on the 7th of November, to a man named Stent, certain poison, to wit, oxalic acid, in a wrapper or a cover which was not distinctly labelled with the name of the article sold, and the name and address of the seller of the said poison.

George Hayward, chemist and druggist, of Windmill Road, deposed that on the 7th of November he sent a person named Stent to the defendant. He brought him back a packet, on the wrapper of which only the word "poison" appeared. The contents of the packet were oxalic acid.

Defendant admitted that the packet contained the acid referred to.

Complainant, in answer to the Bench, said it was not a transaction between traders, but was a *bonâ fide* one of a customer.

The defendant was not a registered druggist or a member of the Pharmaceutical Society.

Stent, who is a bricklayer, said that he received certain directions from Mr. Hayward, and went to Mr. Harrington and asked him for one pennyworth of the same stuff as was on the paper, which had written upon it oxalic acid. Defendant wished to know what he was going to use it for, and witness told him to clean brass with. No name was mentioned whom it was for. He gave it to witness, who paid him one penny. Witness then took it to Mr. Hayward.

By defendant—Defendant did not say the writing was Mr. Hayward's. He said nothing about Mr. Hayward.

Defendant denied trading with Hayward, and said it was only an accommodation of one from the other. He accused the complainant of having a feeling against him for some unknown purpose.

The Chairman told the defendant that there was not the least doubt as to his being guilty of what he was charged with, and the Bench had no alternative but to impose a penalty. The punishment the Bench intended to inflict upon him was that he should pay a penalty of 6*d*.

The complainant was ordered to pay the costs.

Reviews.

Storia della Farmacia e dei Farmacisti, appò in Principali Popoli del Mondo. Per Federigo Kernot. Naples. 1871.

Second Notice.

The first part of this interesting book gave a general outline of ancient history, and we come now to the second part, which the author opens with a chapter on the often-ventilated question of the proper position of the pharmacist; the writer assigns him a high position among scientific men, and he deeply deplores the manner of bringing out numberless specifics and patent medicines as one of the causes which degrade the pharmacist to a trader and shopkeeper, and which profane the sanctuary of the science.

Passing on to the state of pharmacy in different countries, the author begins with England, and his description of our institutions, if not correct, is highly amusing; after having enjoyed more than once in a hearty laugh, we could not but regret, and we must strongly express it, that a work written and compiled with so much care and diligence, should be disfigured by such ridiculous nonsense as many of the statements are. Mr. Kernot speaks of what he saw and learnt amongst us, but we wonder who his guide and interpreter was, because we have learnt a great many things from his book, which we never saw or heard of before. There is a strange confusion of the names of pharmacists, of apothecaries and surgeons, of druggists and chemists and of "*herborists*," which we may well excuse in a foreigner; the apothecary and surgeon holds a position, which, according to the author, forms such a scandalous and odd combination, that it lends a queer and comical side to English life. How busy these gentlemen are; how they run past the shop of the legitimate pharmacist to pay their visits at 5*s.* apiece; how they rush back to their business to compound the medicines for their patients; and how they offend the well-known feeling of English delicacy and prudery. In the windows of some of those gentlemen the author found the inscription, "*delivery room*" (sala disgravi), and to make any mistake impossible, he dilates on the gross impropriety of this institution. We can only surmise that Mr. Kernot saw this inscription at some wholesale house for the delivery of goods, and that a reference to his dictionary suggested a different tale, at which he justly grew very indignant.

The chapter on Spain gives all the laws, but it does not contain anything new to our readers, especially after the recent account of Dr. Ullersberger's history of Spain.

Germany, next in order, is fairly and fully treated, great justice is done to the careful training and instruction of those who devote themselves to the study and practice of pharmacy, which, almost as a matter of course, must secure the high social position the German pharmacist undoubtedly holds. The sometimes very complicated relation of the State and the pharmacist, the examinations and other internal arrangements are so carefully given, that altogether this chapter is one of the best parts of the book; the author is here well at home, and it is the more surprising that he finishes off with a story as contrary to facts and as unlikely as that of the general practitioner and his delivery-room. Who ever saw, at Berlin, an *ehrlicher Apotheker* "go to a patient with a porcelain basin, a towel, a jug of hot water and a supply of leeches"? Well may the author say that the whole appearance of this grave German in black, with white cravat and white gloves, who thus marches out to earn his thaler, is so amusing that an Italian traveller can scarcely help laughing right out.

Leaving the civilized world, the author takes his reader to the barbarians, amongst whom the Chinese stand foremost; with them medicine is quite in its infancy, and savours much of quackery. Itinerant quacks supply the mass of the people with any medicine they require in the most comfortable manner; the quack has his remedies in a box divided into as many compartments as the diseases he cures; the patient merely states his complaint, and without further inquiry the proper medicine is handed over. John Harrow, in his 'Travels through China,' relates how one of these quacks, in Canton, sold a powder as an antidote for snake-bites, the efficacy of which was demonstrated on the spot; the charlatan carried a poisonous snake with him and held it to his tongue, which in a few minutes swelled up to such an extent that the mouth became almost too small to hold it; to excite the compassion of his customers he seemed to suffer most horribly, but at last he put a little of the powder on his tongue, which instantly resumed its natural size, and of course the powder sold wonderfully.

If the poor Chinese are so easily taken in, the higher classes, the mandarins and rich merchants, are much wiser. They make it the physician's interest to cure them as speedily as possible; the physician is paid by the year, but every time his advice is required a deduction is made, and if unfortunately the patient dies, the doctor has to submit to a further reduction of his honorarium corresponding to the duration of the illness.

Various plasters are held in high estimation; some of these act locally, others are preventive of all kinds of diseases, while others again are applied in venereal diseases.

The Chinese pharmacist is looked upon as one of the *savants* of the town; his shop is kept in first-rate order, the medicines are prepared with the greatest care, and his drugs and herbs are of the best quality. The shops are similar to ours, with numbers of drawers and bottles, but extremely plain and simple.

Camphor, rhubarb and liquorice are frequently used, but purgative salts, calomel and all tinctures are unknown. Strange to say, opium, so much indulged in by the Chinese, has no place in their materia medica.

On the other hand, China seems to be the very land for the patent medicine vendor. On the pharmacist's counter we find large boxes, with preparations which instantly cure cholera or confer strength, or impart courage or excite love, so that almost every taste or desire may be gratified.

The doctor is very slow in writing down his prescription, which fills a large sheet of paper, the lines being written alternatively in red and black characters, an occupation lasting from one to two hours. The pharmacist, on receiving the prescription, places it on his counter, and carefully studies it, after which he commences to make it up *lege artis.* Every preparation is wrapped up in white or red paper, the first enclosing the more common articles, whereas the last is only used for expensive substances, as, for instance, the "ginseng." This is the supreme remedy for securing health, prolonging life, and regenerating the whole body. Of course only very rich people can indulge in this luxury, which is so costly that an ounce costs about £5.

The practice of pharmacy is not limited by any legal formality. Every one has the right to open a shop without previous special knowledge; but practically the business is confined to certain families, in which it passes for generations from father to son.

Generally speaking, we may say that the Chinese have no idea of applied natural philosophy or chemistry, but follow their business mechanically and empirically. Here, as in everything else, seclusion from the rest of the world results in perfect stagnation.

Leaping from China to Turkey, we learn that chemistry in Turkish is termed "elsié," whence "elisire," "elixir," a chemical beverage. The Turks also have their favourite compounds, the most noble of which is the "maggium," a mixture of opium, cinnamon, aloes, saffron, cloves, and other spices, which, in the form of pills, is sold in enormous quantities under the name of "habb." The "maggium" or "magic" compound of the upper classes is composed of ambergris, powdered pearls, rubies, emeralds, corals and cochineal. The price of a small bottle is 400 silver piastres, or more than £6 sterling, but this costly mixture is only used by the Sultan and the highest of the realm.

"Tenasne" is an odorous paste, consisting of musk, aloes, ambergris, powdered pearls and attar of roses. Small quantities are taken in coffee, or it is formed into pastilles, and sold under the name of "masch'alla."

Once a year the "escimbaseé," or first physician, and the "gerrabaseé," the principal surgeon to the Sultan, must offer some "maggium" and some "tenasne" to their master, for which they are entitled to a rich present in return.

The final chapter is devoted to Italy, at last united, with Rome for her capital. After a glance at the ordinances under former separate governments, we find extracts from more recent laws, which certainly lead us to assume that the pharmacist's position there is more honourable and more respected than in many other countries. In a few concluding words, the author of this interesting, and in many parts instructive work, winds up with an ardent desire for a European Pharmaceutical Association, which more than any other brotherhood would advance the grand objects of humanity.

A Manual of Therapeutics, considered chiefly with reference to articles of the Materia Medica. By Edward John Waring, M.D., F.L.S. Third edition. London: J. and A. Churchill. 1871.

Dr. Waring's book maintains its character as a useful compilation. In this edition he has introduced the results of a diligent perusal of the medical publications since the appearance of the last. Of the British and American periodicals he seems to have kept well abreast; of the French not so well; and of the most important of all—the German—hardly at all. If he does refer to the therapeutics adopted in the *Klinik* of Vienna or Berlin, it is nearly always at second-hand, as the information has come filtered to him, not invariably in its original purity, through one or other of the home journals. This is a serious defect, vitiating his book as a reflex of contemporary practice hardly less seriously than a like omission would vitiate an English work on chemistry or physiology. Another cause of lessened confidence in his prescriptions is his want of discrimination between the authorities he cites: a general practitioner, for example, being quoted as of equal weight with a first-class hospital physician; or the results (possibly exceptional) of one or two administrations of a drug being advanced as warranting its use in cases only superficially similar. What, for example, can be less satisfactory than the treatment he prescribes for epilepsy,—a malady which appears in the Index as susceptible of about sixty remedies, several of which he notes as preferable by an asterisk, while the mass of them are recommended on the authority of third-rate, or even fourth-rate practitioners! Compilations are useful in proportion to the judgment and skill of the compiler; and though Dr. Waring, especially from his experience in the tropics, is by no means wanting in those requisites, he takes too much at second-hand (and even that on trust) to become the guide of any but the more general of practitioners, or the less particular of medical officers.

BOOKS RECEIVED.

The Liverpool Medical and Surgical Reports. Edited by P. M. Braidwood, M.D., and Reginald Harrison, F.R.C.S. London: J. and A. Churchill. Liverpool: A. Holden. October, 1871.

Symptoms and Treatment of Malignant Diarrhœa; better known by the name of Asiatic Cholera. By William Marsden, M.D. Fourth Edition. London: Wyman and Son. 1871.

Inorganic Chemistry. By the late George Wilson, M.D., F.R.S.E. Revised and enlarged by H. G. Madan, M.A. London and Edinburgh: W. and R. Chambers. 1871. From the publishers.

Smoking; when Injurious, when Innocuous, when Beneficial. By John C. Murray, M.D., F.A.I. London Simpkin, Marshall and Co. 1871.

MEETINGS FOR THE ENSUING WEEK.

Monday Nov. 20.	*Medical Society*, at 9 p.m. *London Institution*, at 4 p.m.—"Bodily Motion and Consciousness." By Professor Huxley. (Educational Course.)
Wednesday Nov. 22.	*Society of Arts*, at 8 p.m.—"On the Present State of the Through Railway Communication to India." By Mr. Hyde Clarke.
Thursday Nov. 23.	*Royal Society*, at 4 p.m.—Annual Meeting. *London Institution*, at 7.30 p.m.—"Science and Commerce, illustrated by the Raw Materials of our Manufactures." By Mr. P. L. Simmonds.

The following journals have been received:—The 'British Medical Journal,' Nov. 11; the 'Medical Times and Gazette,' Nov. 11; the 'Lancet,' Nov. 11; the 'Medical Press and Circular,' Nov. 15; 'Nature,' Nov. 11; the 'Chemical News,' Nov. 11; 'English Mechanic,' Nov. 10; 'Gardeners' Chronicle,' Nov. 11; the 'Grocer,' Nov. 11; the 'Journal of the Society of Arts,' Nov. 11; the 'Chemist and Druggist' for November; 'Food Journal' for November; 'New York Druggists' Circular' for November; the 'Croydon Times,' Nov. 11; 'Dublin Quarterly Journal of Medical Science,' November.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

The Preliminary Examination.

Sir,—The general impression is, that the standard of the Preliminary Examination is too high; and, certainly, from the number that failed at the recent Examination, this opinion appears to be correct.

But ought not the standard to be high for such an elementary examination? For a youth cannot be said to have had a middle-class education who is incapable of answering twelve at least of the twenty questions set; and I should think that that proportion would pass him, inasmuch as the College of Preceptors give a special certificate for any subject on which a candidate has obtained three-fifths of the total number of marks assigned. Surely this examination cannot be made much easier. Compare it with like examinations; take, for instance, the Preliminary of the Royal College of Surgeons of England. In the former there are three compulsory subjects, and in the latter there are ten.

I do hope that in future the Preliminary Examinations of the Pharmaceutical Society will be more rigid, and embrace a greater number of subjects, and then none but the well-educated will become pharmacists.

November 13th, 1871. W. A. M.

Dear Sir,—The following appeared in a provincial paper, October 28th, 1871:—

"Pharmacy Act.—N— B—, now with Mr. J. M. W—, pharmaceutist, O—, presented himself for examination at S— on the 22nd instant, and, in accordance with the rules of the Pharmaceutical Society, was examined in the following subjects:—'Cæsar's Commentaries' (De Bello Gallico), English and Latin Grammars, Composition and Arithmetic; and, having passed with facility, was duly registered."

I presume this was inserted as a cheap way of advertising the establishment to which this learned gentleman belongs; at any rate, it seems to me to be making a little too much noise on passing such an examination as the Preliminary. The pages of the local print ought certainly to be regularly examined, as we may expect a grand report when this gentleman succeeds in his Minor.

W. H. J.

The Tincture Press.

Sir,—The vexed question as to the power capable of being exerted by a man of ordinary strength when turning the lever of a laboratory press can only be settled by experiment. The doing so is so simple a matter that I wonder one of the principal disputants has not ere now enlightened us on the point.

I have endeavoured to supply the omission—in this way. I fastened securely to a beam a four-inch iron pulley, and passed over it to one extremity of the horizontal press-lever a rope which was securely fastened there. The other end of the rope was attached to a board resting on the ground, and on this was piled the weight to be lifted. Mr. Umney will be surprised to learn that a man of average strength can thus raise upwards of 200 lbs. The weight actually raised, and that without extraordinary exertion, was 216 lb., which was effected by four male adults in succession. I have no doubt that 250 lb. would be nearer the limit, provided that the lever be in its best position for the exertion of one's strength, and the power be not diminished by the friction of the pulley, etc. I must explain that my press stands in a recess, and therefore it often happens that the lever does not come round to its best position at the right time. I think of substituting a wheel of the same radius, and thus shall overcome the objection.

Professor Rankine's figures must apply to the *average* amount of power exerted by a labourer during a day's work, and can have no possible reference to such a case as the momentary extreme effort one makes when working a press-handle.

It would obviously be impossible to exert such a force on the press of Mr. Staples' design. In the first place, the press must be securely fixed; secondly, the threads of the screw must be stout enough to withstand the pressure; and lastly, the rod bearing the screw must be stiff enough to resist torsion. I grant that, by applying the power to the nut and not to the screw-head, the tendency to twist is greatly diminished; nevertheless, the friction of the metal surfaces (without which the screw would be useless, as it would run back directly the hands were removed from the handle) must produce a considerable strain of that kind. Mr. Staples would, I think, be disillusionized as to the power of his press, were he to test the endurance of his wooden cross-beam E. It obviously is unable to bear anything like the pressure credited to it. Mr. S. has satisfactorily cleared up the doubt some appear to have entertained as to the superior efficacy of two screws over one.

The idea of interposing a spring between the screw and the marc to be pressed, is, I think, a good one. A metal spring, however, could not be obtained of sufficient strength without incurring great expense. I propose trying the following:—A cylindrical box of iron, about 4 inches deep, and of a diameter equal to the press-body, will contain an india-rubber bag that exactly fits it; on this will be placed a strong cover, thick enough to stand the force of the screw, and having guides on its side to prevent it tilting. It will have to be turned in a lathe so as to exactly fit the cylinder and offer no crevice for the india-rubber to be forced into when under pressure. The air contained in the bag will, of course, be the spring, and being permanently elastic, be capable of sustaining any amount of force one can put upon it. Practical difficulties will, I suppose, crop up. I look forward with apprehension to the bursting of the cylinder, leakiness of the bag, etc. However, should I try it, I will candidly report results.

There can be no doubt of the advantage that would be gained by giving to the pressure a degree of permanence, and to attain it is worthy of an effort.

I have a press constructed like a cheese-press, except that its lever is compound. The nominal pressure exerted by it is 5 tons. As the weights descend they are raised again by a screw and lever. In some respects it is useful, but I found that its power was far inferior to that of my large press with lever of 14-inch radius and screw-threads half an inch apart. The iron cross head or nut of this press I may mention is 3 inches deep in the centre, and is the third that has been fitted to it; the previous ones having been unequal to the occasion. This perhaps is accounted for by its having sometimes to submit to the united forces of two strong men, who would together exert a force of at least 350 pounds.

The compound hydraulic press of Desgoffe, a very useful and ingenious machine, is, I fear, too expensive for the ordinary retail druggist. I have often had it in my mind to adapt to the ordinary press some means for giving the marc a final pinch at the end of the operation. Hunter's differential screw, worked by means of a powerful lever and advancing one-sixteenth of an inch each revolution, would give a very powerful pressure, and would, doubtless, be cheaper to construct originally and less liable to get out of order than a hydraulic arrangement.

The fact, often lost sight of, that the intensity of the pressure exerted is proportional to the area over which it is spread,—so that, other things being equal, the intensity is doubled by the area being reduced to one-half, and *vice versâ*,—enables one to achieve, when desired, a more complete exhaustion of the marc, and tends to equalize the power of large and small presses.

THOMAS B. GROVES.

THE CHLORAL CONTROVERSY.

Sir,—Your remarks on chloral are interesting: the quantity given (half a ton) would not amount to more than about half an ounce to each of the 20,000 practitioners in Great Britain and Ireland; this the *Echo* refused to state. I find this paragraph as to a Lunatic Asylum in one of the journals, "The amount used is ninety pounds in 370 cases! In one case 20-grain doses were given for 257 consecutive nights, with the happy result of securing refreshing sleep; the patient recovered." We need scarcely require then the extraordinary conjecture of the *Echo*, that as chloral is cheaper than cocculus indicus, the chemists and brewers are in league to supply it in tons to our beer and ale shops!

CHARLES KIDD, M.D.

Sir,—Although much has been said respecting this remarkable substance, doctors seem as little likely to agree respecting its properties as ever.

A case in point may serve as a comment upon its alleged cumulative power. A gentleman, for whom I recently dispensed, took nightly at 9 P.M. 35 grains, and at 3 A.M. 45 grains of the crystalline salt during the space of nearly three months.

If the opinion held by some authorities be correct, the man ought to have died long since; instead of which, his medical attendants report that the case is progressing favourably.

Some misconception seems to exist as to the quantity of chloral hydrate actually made; but the consumption must, of necessity, be very large if the above-cited case is to be taken as an average.

Australia alone consumes a large proportion of what is exported from this country.

R. GOODWIN MUMBRAY.

Richmond, S.W., Nov. 15th, 1871.

SPURIOUS SPECIMEN OF HEMLOCK FRUIT.

Sir,—While preparing for the Minor examination, a short time ago, I had occasion to make use of a collection of Materia Medica specimens, which had been supplied by a first-class wholesale house.

In going over the various specimens it contained, I came upon a parcel labelled "Conii Fructus," which, on examination, proved to be spurious, as it consisted almost entirely of other umbelliferous fruits, there being only a very few hemlock fruits intermixed. I have the parcel still in my possession. The greater portion appears to be the fruit of a species of *Caucalis* (*Torilis*), as it has a decided parsley taste, and is remarkably bristly, some of the bristles being hooked.

I enclose a specimen for recognition.

Such an occurrence ought to enforce on all engaged in the business the value of an intimate acquaintance with the several articles of the Materia Medica; and should also suggest the necessity of carefully examining all purchases of drugs, etc., no matter from what source they may be procured.

Belfast, November 13th, 1871. THOMAS GREEN.

[*** The parcel of umbelliferous fruits sent by our correspondent contains a mixture of three different genera at least. The proportion of *Conium* fruits is very low, the bulk being composed of the spiny fruits of a species of *Caucalis*, near *C. macrocarpa*.—ED. PHARM. JOURN.]

DIFFICULTIES IN DISPENSING.

Sir,—In Mr. Wilkinson's paper, published in last week's Journal, I find the recommendation of a most objectionable practice unchallenged by the meeting before which it was given.

The practice is that of making material alteration in a prescription without the sanction or the knowledge of the physician; such as omitting a portion of an active ingredient altogether, or substituting for it another of different power.

I am more especially led to draw your attention to the matter, as in each of the cases given no such difficulty exists as to render the change necessary.

Stockton, November 14th, 1871. T. B.

Erratum.—We are requested by the Hon. Secretary of the Leeds Chemists' Association to make the following corrections:—In the report of the annual meting of that Society, *ante*, p. 347, col. 1, l. 36, for "party influence" read "parliamentary influence."

C. Gerring.—Rub the turpentine with the yolk of egg in a mortar, add rose water as required, transfer to a bottle and shake with the acetic acid, then gradually add the remainder of the rose water.

W. Owen.—Rub the acetate of morphia with the glycerine, and add to the oil and chloroform previously mixed.

"*Juniperus Sabina.*"—The specimens forwarded are all from *Juniperus Sabina.*

COMMUNICATIONS, LETTERS, etc., have been received from Mr. J. R. Jackson, Dr. De Vrij, Mr. M. C. Cooke, Mr. F. Wheeler, Mr. David, Mr. W. Bates, Mr. W. S. Brown, Mr. S. Payne, H. E. R., T. B.

NITRITE OF AMYL.*

BY ALFRED B. TANNER.

Nitrite of amyl is a comparatively recent addition to our materia medica; so far as I can discover no notice of its employment therapeutically in this country occurs previously to September, last year (1870), when Dr. Richardson—in an editorial paper in the *Medical Times and Gazette*, and which was subsequently copied into the other Journals, the Pharmaceutical included—gave some very interesting results of his experiments with nitrite of amyl, and quoted several cases of its successful employment in a very distressing disease, called angina pectoris. It, however, appears to have had a very limited use in medicine until quite recently, when Dr. Talfourd Jones published a paper in the *Practitioner*, and also one in the *British Medical Journal*, describing the very great success he had met with in the employment of it in certain spasmodic diseases, besides the one previously mentioned, and in asthma and complaints of an allied character. It is not my intention to enter fully into the therapeutical portion of the subject, as I think this scarcely our province; my intention more particularly is to describe its physical properties, together with the method and difficulties of its preparation in a pure state and fit for medicinal use; still I think it desirable that we should know somewhat of its action and effects on the system also.

The earliest observed action on the system of this remarkable substance is due to F. Guthrie, in 1858, who specially observed that on inhaling its vapour, it caused flushing of the face and strong pulsation of the carotid arteries, with a much increased action of the heart; these effects led him to the supposition that it would be a valuable restorative in cases of drowning, suffocation and suspended animation generally. Dr. Richardson also showed that the inhalation of its vapour was followed by an increase of the heart-action to a much greater extent than could be produced by any other known agent, also that the face and surface generally became deeply flushed; when the inhalation had been carried to a considerable extent, the breathing became excited and breathlessness was produced, like that caused by violent exertion as running, rowing, etc. In no case was anæsthesia produced by it. Its use in angina pectoris was first advocated by Dr. Lauder Brunton. The latest investigations into its use in disease are those before referred to by Dr. Talfourd Jones, who seems to have used it extensively; he states that it may be administered by the mouth, by inhalation or by subcutaneous injection, but that the safest method is inhalation; he used five drops on a piece of lint and held close to the nostrils for ten or twenty seconds, or until acceleration of the pulse and flushing of the face commences. His paper is a most interesting one, and may be found in the *Practitioner* for October this year; in the same paper, also, occur some suggestions for its employment as an antidote to counteract the effects of an overdose of such medicines as chloral, ergot, etc. But by far the most important suggestion for its employment, is that by the same author, given in the *British Medical Journal* for September 30, 1871, and which, if realized, will go far to make it one of the most remarkable and beneficial medical discoveries ever made,—it is its employment as a remedy for the collapse and cramps of cholera. No experiments in this direction appear yet to have been made, but from the very able and lucid arguments brought forward in his paper, there appear every probability of its being the true remedy for this dreadful disease. It is, undoubtedly, a remedy of great power, and will, doubtless, come into pretty extensive use. Having given this slight sketch of its therapeutical employment, I will now proceed to a description of its physical qualities and method of its preparation.

Nitrite of amyl, like most other substances of its class, was known to the chemist long before it was made use of in medicine; to M. Balard, in 1844, is due the discovery of this substance.

It is an amber-coloured liquid, with a taste and smell reminding one something of ripe pears; but it is remarkable that nearly all the compounds of the amyl group possess something of this peculiar odour. Its formula is $C_5 H_{11} N O_2$, and it is a corresponding compound to nitrite of ethyl, $C_2 H_5, N O_2$, which is contained in the spirit of nitrous ether of the Pharmacopœia. When pure and perfectly dry, nitrite of amyl has a boiling-point of 99° C.; when containing moisture, as it usually does, the boiling-point will be some few degrees lower, say about 96°, and this is the figure given by Balard. Another authority (Rieckher) states its boiling-point to be 91° C., and these discrepancies are, doubtless, owing to the fact before mentioned, viz. the presence of moisture; this being supposed to diminish the cohesion between the liquid and the glass, and so cause the ebullition to take place at a lower temperature, which is the case with almost all liquids,—their boiling-points being higher when boiled in glass vessels than when boiled in metallic ones, on account of the increased cohesion, owing to the extremely smooth surface which glass vessels present in comparison with metallic ones. The sp. gr. of pure nitrite of amyl is ·877; it is almost insoluble in water, but freely so in ordinary alcohol, ether, chloroform, benzole, etc.; it is itself a solvent of fats, oils and fatty acids; sulphur and phosphorus are but sparingly dissolved by it. Unlike the nitrite of ethyl, it does not appear to be decomposed or suffer any change by keeping; I have some which I prepared some twelve months since, and which appears as unchanged as when it was prepared, and is neutral to test-paper. Nitrite of amyl is usually prepared by passing nitrous gas into purified amylic alcohol, at a temperature of 132° C., the boiling-point of the amylic alcohol. This process is a very tedious and unsatisfactory one, as was pointed out in a recent number of the PHARMACEUTICAL JOURNAL, by Mr. J. M. Maisch. Five ounces and a half of purified amylic alcohol require from eight to nine hours before becoming completely saturated with the gas; in addition to which, the product is very impure and small in quantity; fractional distillation being necessary to get anything like a pure product. The impurities are for the most part ethyl-amylic ether, amylic aldehyd and very considerable quantities of hydrocyanic acid, all formed during the decomposition of the amyl alcohol by the nitrous gas. The nitrous gas is produced by reducing $H N O_3$ by means of starch in a glass-flask and conveying the vapours into the amylic alcohol heated to 132° C. The process first suggested for its formation by Balard, in 1844, consists in introducing into a capacious glass-retort, capable of holding at least four

* Read at a meeting of the Liverpool Chemists' Association, November 9th, 1871.

times the quantity, a mixture of equal volumes of amylic alcohol and HNO_3, the retort being connected with an efficient condenser, a gentle and very gradually increasing heat is applied; after rising to a certain temperature the source of heat is withdrawn and the reaction allowed to go on by itself. Considerable frothing and violent action take place if the heat has been too long applied; the thermometer inserted in the tubulus of the retort rapidly rises, and the product produced is collected until the temperature rises to 100° C., after which the receiver is changed, as the product then becomes too impure to be of any use, containing as it does nitrate of amyl and ethyl-amylic ether; this may be readily distinguished by the change there is in the odour of the distillate. The product which was collected before the temperature reached 100° C., is now treated with a solution of $NaHO$, which removes and fixes both the free HNO_3 with which it is sure to be contaminated, and also the HCN, formed during the decomposition of the amylic alcohol by the nitrous gas; in this reaction, omitting secondary decompositions, the HNO_3 is reduced to HNO_2, which attacks the amylic alcohol forming nitrite of amyl. Of course this reaction is nothing like perfect, or we should have the pure nitrite without further trouble; part of the nitric acid escapes decomposition entirely, hence the presence of nitrate in it. HCN, also, is formed, and may be detected in the alkaline solution used for washing the impure product, in the form of KCN or $NaCN$, as the case may be; it may also be detected in the product itself, by means of a drop of $AgNO_3$ placed in the centre of a watch-glass and inverted over another glass containg a small quantity of the impure nitrite; $AgCN$ is produced in the form of a white film on the surface of the drop. The washed product is separated by decantation or by means of a pipette and introduced into a clean retort and again slowly distilled. That portion which comes over before the temperature reaches 96° C., contains the amylic aldehyd; this is set aside and a fresh receiver placed. That collected between 96° and 100° C., consists for the most part of nitrite of amyl. After the temperature has risen to 100° C. the distillation is stopped; the retort will contain the ethyl-amylic ether, whose boiling-point is above 100° C. The yield by this process is very small, and it is in many respects inconvenient. Another process for preparing this substance is given by Nalder, which he says readily yields the pure nitrite, but the merits of which I am unable to state, having never had experience with it; it consist in distilling amylo-sulphate of potash with nitrate of potash. Judging from analogy, if this process yields pure nitrite of amyl, it ought to be a very efficient one for the preparation of nitrite of ethyl, and, consequently, for spirit of nitre, a good process for which is still a desideratum; of course, in the latter, it would be necessary to use ethyl-sulphate of potash instead of the amyl compound. I am not prepared at present to state what difficulties there may be in the way of preparing the amyl-sulphate of potash; the ethyl compound is not difficult to prepare, and a process for it may be found in most text-books on chemistry.

The process by which I have been in the habit of preparing nitrite of amyl, and of which I now intend giving you a description, is one which I think will be found convenient for its preparation on a small scale, and of sufficient purity for medicinal use. I do not claim any originality for it, as it is probable that many may have thought of it although not put it into practice. So long ago as July last year, while making spirit of nitrous ether by the Pharmacopœia process, the idea occurred to me that, with some modification, this might be made a convenient one for the preparation of nitrite of amyl. A demand for the latter arising just then, I put it into practice. In Mr. Maisch's paper in the April number of the Journal for this year, he states that the same idea occurred to him, but that he found it not to answer, and this I think may be easily accounted for. The process for spirit of nitrous ether, as you are all aware, consists in distilling, at a certain temperature, a mixture of rectified spirit, sulphuric and nitric acids in certain proportion, and copper wire; the distillate consists mainly of a mixture of nitrite of ethyl and ethylic alcohol. Now, by substituting amyl alcohol for the rectified spirit in this process, you get nitrite of amyl among other products; but Mr. Maisch appears to have overlooked one fact, viz. that rectified spirit contains 16 per cent. of water, and that the amylic alcohol he used was nearly anhydrous. He states that the amylic alcohol, *i. e.* the purified substance, was mixed with sulphuric acid, the mixture introduced into a retort, together with some copper wire, and, after cooling, HNO_3 was added. In a very few moments the evolution of gas was observed, the liquid became hot without the external application of heat; and the reaction very rapidly increased to such a violence that the entire charge was lost, it being impossible to condense any of the vapours in a Liebig's condenser, or to retain much of the liquid forced over into the receiver. I may add, that I have repeated this experiment with exactly the same results; nearly the whole charge was forced over into the receiver, and, while there, the action again commenced, and increased to such violence that I have no doubt it would have forced itself back into the retort again if their mutual positions had been favourable. As it was, I was obliged to introduce it to the open air, for the whole house became filled with the vapour, and every one who respired it became suddenly red in the face. Upon one of my assistants it had a very remarkable effect; it seemed to affect the muscles at the back part of the neck, and drew the head backwards, but this soon passed off. I should quite expect that the reaction would be just as violent in making spirit of nitrous ether, if we used anhydrous alcohol instead of 84 per cent. as ordered. In preparing the nitrite of amyl by the process I employ, it is of the utmost importance that the amylic alcohol be as pure as possible. Amylic alcohol, as you all know, is formed during the fermentation of potatoes, rye, barley and the marc of grapes; and when these are distilled it communicates a very pungent, and to many repulsive, odour and taste to the spirits. It is considerably less volatile than either ordinary alcohol or water, having a boiling-point, when pure, of 132° C.; in consequence of this property, it accumulates in the last portions of the liquids that are distilled. Its name is derived from *amylum*, starch,—this being the most abundant constituent of potatoes. Liebig states that amylic alcohol is formed principally in the fermentation of alkaline or neutral liquids, and its production in the potato mash may be prevented in great measure by adding crude tartar to the fermenting liquid. Its formation never occurs in acidulous fermenting liquors which contain tartaric, racemic, or citric acids. The addition of hops to the liquid has a similar effect in checking the development of amylic alcohol, or fusel oil, as it is generally termed. It is, when pure, a colourless limpid liquid, of a penetrating and disagreeable odour, exciting headache and coughing when its vapour is inhaled. It is sparingly soluble in water, though it mixes in all proportions with alcohol, ether and essential oils. It is not easily inflammable, but burns with difficulty, giving a bluish flame. Its specific gravity, when pure, is ·818, and boiling-point 132° C. Amyl alcohol is not acted upon by the atmosphere, except it be in a very thin layer, or under the influence of spongy platinum, when it is oxidized into valeric acid, $C_5H_{10}O_2$, which acid bears the same relation to amylic alcohol that acetic acid, $C_2H_4O_2$, does to ordinary alcohol. Fusel oil, as met with in commerce, is usually a clear yellowish liquid, with a peculiar penetrating odour, varying, of course, with the substance from which it has been produced. It has a specific gravity of from ·840 to ·850, and is largely contaminated with the lower alcohols of this series; so far as my experience goes, it is only about half pure amyl alcohol. As I have before stated, it is of the utmost importance, in the preparation of nitrite of amyl, that the amylic alcohol be as pure as possible, for it is much easier to purify this than to purify the nitrite produced from it in its impure state. For this purpose, the best process is first to agitate the fusel oil with about an equal bulk of a strong solution of chloride of sodium; this usually reduces its bulk about 16 or 20 per cent., and also considerably lowers the specific gravity. This washed product is separated and introduced into a retort furnished with a thermometer; that portion of the distillate which passes over before the temperature reaches 125° C. consists mainly of the lower alcohols of this series, and whose boiling-points are below that of amylic alcohol, for the boiling-point rises in proportion as the compound is richer in carbon. The distillate collected between 125° C. and 140° C. is collected apart, and redistilled until it has a boiling-point near 132° C.; this may then be considered pure enough for our purpose. This is then introduced into a glass retort containing some copper wire, and furnished with a safety tube, and one-tenth its bulk of H_2SO_4 added. The same quantity of HNO_3, diluted with an equal volume of water, is next put in, and a very gentle heat applied until the temperature reaches about 65° C., when the reaction will commence and proceed in a perfectly manageable manner, until a bulk about equal to double the quantity of HNO_3 added collects in the receiver, the temperature in the meantime rises to about 98° C. The reaction ceases very quickly, as in the case of spirit of nitrous ether. The temperature having fallen somewhat, another portion of HNO_3, equal in bulk to the first, is added, and this process of successive additions of the acid continued until nearly the whole of the amylic alcohol is exhausted, which may be known by the dense red fumes evolved from the retort. The distilled product exceeds in bulk the amylic alcohol used, and is the impure nitrite of amyl. This is washed with solution of $NaHO$ to remove the HCN and other free acids present, and rectified over fused K_2CO_3 to get rid of moisture. The portion which distils between 95° and 100° C. is collected as nitrite of amyl, sufficiently pure for medicinal use.

It has several times been stated that nitrite of amyl produces violent headache, and also coughing and irritation of the larynx; this, I think, must be due to its insufficient purification. The presence of HCN and undecomposed amylic alcohol would, I think, account for this; no such effect was produced on myself with the purified nitrite. Mr. Umney has shown, in an article in the PHARMACEUTICAL JOURNAL of November, 1870, that the samples then met with were very impure.

VESICATING INSECTS.

BY M. C. COOKE, M.A.

(*Continued from page* 384.)

ASSAM BLISTER FLY, *Lytta assamensis*, Water.; *Lytta tibialis*, Water.

Probably forms of the same species. *Cantharis assamensis*, and *C. tibialis*, C. Waterhouse in Trans. Ent. Soc. Lond. 1871, p. 407.

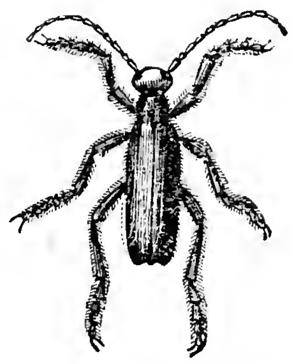


Fig. 8.—*Lytta assamensis.*

This species most nearly resembles *C. ruficeps* of Illiger, but is distinguished from it by the narrow margin of white pubescence to the elytra, and by the broad hairy anterior tibia in the male.

Male.—The head is reddish-yellow, and (with the exception of a smooth spot at the base of each antenna) somewhat thickly, and not very strongly punctured; the anterior margin of the clypeus is fuscous, as are the labrum and other parts of the mouth. The antennæ are filiform; the third to sixth joints each notched for the reception of the following joint; the third joint is about equal in length to the fourth and fifth joints together; the fourth, fifth, and sixth are rather short, nearly equal in length; the seventh to eleventh gradually increasing. The thorax is subquadrate (abruptly contracted in front), thickly, evenly, and distinctly, but not very strongly punctured; there is a slight impression on either side at the front, and a deep central fovea at the posterior margin. The elytra are scarcely broader at the apex than at the base, each rounded at the apex; the extreme margin and the suture fringed with white pubescence. The anterior tibiæ are broader towards the apex, thickly set with long black hair on the outer side; the inner side of the fore femora and tibiæ are clothed with yellowish pubescence.

The female of *C. tibialis* have the third to sixth joints of the antennæ not so strongly notched at the apex, the head without the smooth spot at the base of the antennæ and the fore tibiæ without long pubescence. The species which I have named *C. tibialis* (Trans. Ent. Soc. Lond. 1871) differs from *C. assamensis* in having the head less thickly punctured, and in having the mesothoracic epimera clothed with white pubescence.—*C. W.*

This species is found in Assam, where it is employed as a vesicant, and probably also in Upper Bengal. The two forms or species are collected together indiscriminately.

NEPAL BLISTER FLY, *Lytta Nepalensis*, Hope; black, head rufous, antennæ filiform, tibiæ not hairy behind, elytra broader towards the apex.—*Epicauta nepalensis*, Hope, Gray's Zool. Misc. p. 32.

Cantharis nepalensis, C. Waterhouse, Trans. Ent. Soc. 1871, p. 405.

Closely allied to *C. ruficeps* of Illiger, but is to be distinguished from it by the deeper red colouring, and strong punctuation of the head, and by the elytra being distinctly broader towards the apex.

The head is dull dark red, not very thickly, but somewhat strongly punctured; the clypeus is almost entirely black, as are also the labrum and other parts of the mouth. The antennæ are filiform, very slightly pubescent; the first joint short, the second very short, the third the longest, the fourth to seventh equal, the eighth to tenth rather shorter, the eleventh a little longer than the seventh. The thorax is subquadrate (contracted in front), thickly and distinctly punctured, less closely, and rather more strongly on the disk; the fore part is slightly impressed on each side, there is a faint longitudinal line on the disk, and a deep fovea in the centre of the posterior margin. The elytra somewhat broader towards the apex, where they diverge, each rounded at the apex, the whole surface distinctly punctured. The under side of the insect is entirely black, clothed with long black pubescence; legs simple; the anterior tibiæ not dilated, nor clothed with long hair. Length $6\frac{1}{2}$–$11\frac{3}{4}$ lines.—*C. O. W.*

Included in the Pharmacopœia of India, in note, where it is stated to be one of the vesicants employed.

Mr. C. Waterhouse has also described a black species from Allahabad, in the 'Transactions of the Entomological Society,' which is probably also employed as a vesicant. It is named by him *Cantharis hirtipes*, and is very closely allied to *C. nepalensis*, but larger and more cylindrical. Length $12\frac{1}{2}$ to $13\frac{1}{4}$ lines.

Red-breasted Blister Fly, *Lytta ruficollis*, Fabr.; golden green, thorax rufous, attenuated anteriorly.—Fabr. Ent. Syst. 1. p. 85; Oliv. Ent. iii. t. i. f. 6. *L. syriaca*, Fuessly, Arch. t. 30, f. 1. *L. tenuicollis*, Pall. Ic. p. 102. t. E. f. 35.

Native of the East Indies. A little smaller than the common blistering-fly. Antennæ filiform, bronzed. The head is inclined, of a golden green, with the eyes black. Thorax rufous, attenuated anteriorly. Elytra flexible, minutely punctulate, golden-green. Body beneath golden, subtomentose. Tibiæ dark ferruginous. Feet coppery green.

Christison states that this species is employed in the Deccan.

Yellow Deccan Blister Fly, *Lytta Rouxii*, Castelnau; black, above and below clothed with short golden pubescence, elytra and tibiæ pale brownish-yellow. Length 6–$8\frac{1}{2}$ lines.—Castelnau, Hist. Nat. des Insectes, ii. p. 274.

Male.—The head is moderately thickly and strongly punctured, with a slight impression on the forehead; at the base of each antenna is an ovate smooth spot, impressed in the middle; the front of the head between these spots also is smooth. The first, second and upper edge of the third joints of the antennæ are pitchy-red, the third and sixth joints are triangular, the seventh joint very slightly so, the eighth to eleventh cylindrical. The thorax is black, subquadrate, finely punctured, a trifle longer than broad, suddenly contracted in front, longitudinally finely canaliculate on the disk; the elytra are very little broader at the apex than at the base, very slightly diverging at the apex, where each elytron is rounded; anterior femora not furnished with any special silky spot at the base; the basal joints of the tarsi have a tendency to reddish-yellow, especially those of the fore-legs.

Female differs from the male in having the third to sixth joints of the antennæ not dilated, and the head is punctured almost to the front margin, without the smooth spot at the base of the antennæ.—*C. O. W.*

Found in Bombay, and, according to specimens in the Museum of the Pharmaceutical Society, in the Deccan. These specimens are labelled *Cantharis aurata* and *C. ruficollis*; but the two bottles of specimens appear to be specifically the same. They are believed to be commonly employed as vesicants in that part of India. Mr. C. O. Waterhouse refers these specimens to the species above named, but adds, "Castelnau's description does not mention that the thorax is black; his specimen may have been immature, but should the insect above described prove distinct, the name *C. aurulentus* might be given to it."

Under the name of *C. aurata*, Dr. Christison mentions a species which is used in the Deccan. It may be the above.

Andol-Andol. Dr. Roxburgh Wylie, in a recent communication to the *Australian Medical Journal* (March, 1871), states that "during my three and a half years' residence in the island of Java, Dutch East Indies, I found that a vesicant was extensively used in medical practice, the name or existence of which I had never before heard. Like cantharides, tinct. andol-andol is obtained from a fly. It is found in China in great abundance. It is of a dull, dirty leaden colour, about twice the size of the Spanish fly, and in general appearance not unlike a large Australian blow-fly. The tincture of andol-andol is most convenient as a blistering fluid, being painted on the part to be vesicated, just as tincture of iodine is used. It dries on the skin in a few seconds after application, and vesicates most effectually in from three to four hours.

"Before applying it, however, the skin of the part to be blistered should be washed, first with soap and water, and then with common vinegar. Ever since I first heard of it, until now, I have used tinct. andol-andol and never found it fail. It can be had of any chemist in Java."

Of course it would be only speculation to name any insect as the source of this vesicant, but the probability is in favour of its being some species of *Cantharis*. The only one specifically named by Dr. Porter Smith in his 'Chinese Materia Medica,' is *C. erythrocephala*, which he says has been met with in Shanghai and Chefoo. It is possible that the andol-andol may be the *Huechys sanguinea* hereafter to be alluded to. If so, its mention here is premature.

(To be continued.)

CROTON CHLORAL.

The following particulars concerning a new organic compound, to which Dr. Liebreich has given the above name, have been furnished to the *Medical Times and Gazette* by Dr. Julius Althaus:—

"I think it will be interesting to the readers of your journal to hear that Dr. Oscar Liebreich, of Berlin, to whom we owe that valuable therapeutic agent, hydrate of chloral, has lately been engaged in investigating the physiological and therapeutical properties of a new organic compound called croton-chloral, which is formed by conducting chlorine gas into allylene. A peculiar action of this new substance upon animals is, that at first a high degree of anæsthesia in the head is produced, while sensibility in the other parts of the body remains intact. The second stage is, that the spinal cord loses its function, and reflex excitability is everywhere extinguished. During that stage both pulse and respiration remain unchanged. The third stage, which is induced by large doses, is characterized by paralysis of the medulla oblongata and death. Animals may, however, be kept alive by artificial respiration, because the function of the heart is not interfered with; while the ultimate effect of hydrate of chloral is to paralyse the heart. The first therapeutical experiments with the new compound were made in the University Clinique of Berlin. Complete anæsthesia of the fifth pair of cerebral nerves was produced in a child, reflex excitability in the other parts of the body continuing unchanged at the same time. Pulse and respiration remained exactly the same during the whole time of the narcosis. Further experiments upon insane patients showed that we possess in croton-chloral a remedy by means of which the brain may be profoundly narcotized without any other functions being disturbed, while by chloral not only the brain, but the nervous system altogether, is rendered anæsthetic, and the heart's action is diminished, which must always constitute a source of danger. Croton-chloral, therefore, promises to produce all the good effects of hydrate of chloral without any drawback being attached to its judicious use. Its apparently specific effects on the fifth pair of cerebral nerves makes us indulge the hope that it may perhaps be found useful in that most intractable affection, true tic-douloureux, or epileptiform neuralgia of the face."

SYRUP OF SENNA.

BY J. B. MOORE.

This syrup, which was officinal in the U. S. P. of 1850, was omitted in that of 1860, the authors, perhaps, thinking that its place might be supplied by the fluid extract; but, as the syrup has been so long known and used, not only in professional but also in domestic practice, there still exists for it a lingering demand, which is likely to continue. To supply this demand the pharmacist is compelled to keep the syrup constantly on hand; and, as the formula of the U. S. P. of 1850 yielded rather an uncertain preparation, which was very liable to spoil if long kept, I thought I would offer a formula for its preparation, which I have used for several years, and which will afford a reliable and permanent syrup. As an evidence of this, I have samples of it which have kept for nearly three years unaltered. The demand for the syrup in some localities being limited, and the fact of its being an unstable preparation as made by the late officinal formula, some pharmacists have been led to the habit of making it, in small quantities, as needed, from the fluid extract; but this practice should not be encouraged, and it is only when the pharmacist makes correctly his own fluid extract, and is sure of its reliable quality, that this mode of preparing the syrup should ever be employed.

The following is the process which I have adopted:—

℞.	Pulv. Sennæ, No. 60	℥ij troy.
	„ Fœniculi, No. 60	℥j „
	Sacchar. alb., sifted	℥ix „
	Glycerinæ	f℥iv „
	Alcohol. dil.	sufficient quantity.

Mix the powders, and, having moistened the mixture with dil. alcohol, pack it firmly in a glass funnel prepared for percolation, and gradually pour diluted alcohol upon it until sixteen fluid ounces are obtained, or until the mixture is exhausted. Set aside in a shallow dish, in a warm place, the first four fluid ounces which pass, to evaporate spontaneously to two fluid ounces. To the remainder of the percolate add the sugar, and evaporate it in a water-bath at a temperature not exceeding 160°, with frequent stirring, until the whole measures, when cold, ten fluid ounces. To this add the glycerine and reserved portion, mix well and strain through muslin.

If the percolation is managed with care, the reserved percolate will contain at least four-fifths of the active properties of the senna and the aromatic qualities of the fennel. This, then, being evaporated spontaneously, and the remaining portion protected by the sugar from the injurious effects of the atmosphere during the concentration, furnishes a syrup embodying the virtues of the senna and fennel unimpaired.

One serious objection to the process of the U. S. P. 1850, was the prolonged exposure to heat necessary to reduce the syrup to the "proper consistence," during which a great portion of the volatile oil of the fennel must have been dissipated, and the purgative properties of the senna in a measure diminished, while at the same time its griping tendency was promoted.

This same objection applies with double force to the present British process, presented in the last edition of the U. S. Dispensatory. In that process about one hundred fluid ounces of infusion are directed to be reduced, by evaporation, to ten fluid ounces. It can well be imagined what influence this torture, as it were, would exert upon the medicinal properties of the senna, if they are at all vulnerable to the effects either of heat or atmospheric oxygen.

Another very objectionable feature of the British syrup is that of its strength, which is about four times as great as that of the U. S. P. 1850. Upon this point Dr. Wood, in his comments upon the process in the U. S. Dispensatory, very properly makes the following remarks:—"The present British syrup, which has superseded the former syrups of the London and Edinburgh colleges, differs from them, as well as from that of the U. S. P. of 1850, very greatly in strength, so that in prescribing it physicians accustomed to the doses of the former syrups must be on their guard not very seriously to overdose their patients." These remarks are equally applicable to its use in domestic practice; and, since it is chiefly given to children, its administration in excessive doses might be attended by mischievous results.

As the British process is the only one that the late edition of the U. S. Dispensatory offers to American pharmacists for their guide in the preparation of this syrup, and as it has an established reputation they are obliged to keep it in stock, I think it highly important that it should be reinstated in the next edition of our Pharmacopœia, and a good working formula given, which will yield a reliable and at the same time a *permanent* preparation, corresponding in strength with that of the U. S. P. 1850.

The proportions of senna and fennel, in the formula given above, correspond precisely with those of the formula of our late Pharmacopœia; but in the latter process the volatile oil of the fennel was only partially extracted by the aqueous menstruum, and a portion even of that must have afterwards been lost in the evaporation of the syrup. This, therefore, necessitated the employment of a large excess of the fennel.

Now, since in the process proposed by me the aromatic properties of the latter are entirely extracted, and there is but slight if any loss by subsequent evaporation, I think that the quantity of the fennel might with propriety be reduced one-half, and still be sufficient to answer all purposes for which the aromatic is employed, without in the least impairing the virtues of the syrup.

It will be observed that in the above formula I have employed diluted alcohol as the menstruum in the place of water, which has heretofore been exclusively used. This has not been done unadvisedly, but from a strong conviction that the alcoholic menstruum possesses superior advantages over that of the aqueous one; for by means of it there is obtained directly, by the process of percolation, a more highly concentrated solution, obviating the long and tedious application of heat necessary to reduce the aqueous solution to a proper strength, thus more than counterbalancing whatever advantages, if any, therapeutically, the aqueous may have been supposed to possess over the spirituous solvent.

It has doubtless been owing to the tedious and inefficient methods heretofore in vogue in the manufacture of this syrup that this formula has been discarded from our Pharmacopœia, and to its partial disuse in professional practice. It is certainly, however, when properly prepared, an efficient, useful and convenient preparation for children, for whom it was originally intended; and if a reliable and satisfactory formula, such as we present, should be adopted in its manufacture, its restoration to its former place in professional favour will doubtless follow.—*Amer. Journ. Pharm.*

THE MOST IMPORTANT METHODS OF DETERMINING ARSENIC VOLUMETRICALLY.

BY E. WAITZ.*

The author has investigated with great care the different methods for determining arsenious acid, viz., 1st, by means of free iodine; 2nd, by means of dipotassic dichromate; 3rd, by means of potassic permanganate; as well as the method for estimating arsenic acid by means of uranic acetate.

The iodine method depends, as is well known, upon the conversion of arsenious into arsenic acid in alkaline solution. In an acid solution arsenious acid can exist in the presence of iodine or chlorine, and is only partly converted into the higher oxide. The alkali must be in the form of a carbonate, for a caustic alkali combines with the iodine. The author's experiments show that normal sodic carbonate fixes iodine, but that the acid carbonate does not; a solution saturated in the cold should be used. This only confirms the previous observations of Fresenius. On employing a standard solution of arsenious acid in hydrochloric acid, the free acid has first to be neutralized by means of caustic soda or acid sodic carbonate. With an excess of this latter salt, good results were obtained.

Experiments made with a view of converting precipitated arsenious sulphide into arsenious acid by the action of an ammoniacal solution of silver nitrate upon the sulphide dissolved in ammonia, as well as by means of freshly precipitated bismuthous hydrate, and of substituting in this manner the trisulphide—which can be obtained in a state of great purity—for the trioxide, were unsuccessful, as the reaction is never quite complete, owing to the formation of sulpho-salts of silver and bismuth.

The method first proposed by Kessler † of determining arsenious acid in an acid solution by means of dipotassic dichromate, and standardizing back by means of a ferrous sulphate solution, gave good results. Excess of hydrochloric acid has to be avoided. Kessler succeeded in utilizing arsenious sulphide by treating it in a hydrochloric acid solution with mercuric chloride, a saturated solution of which converts the sulphide slowly at the ordinary temperature, more rapidly on the application of a *gentle* heat, into the trioxide. The reaction is over when the mass has become white. The author's experiments show further that the mixture of trisulphide and sulphur which is obtained when a solution of arsenic acid is precipitated with sulphuretted hydrogen, cannot be converted directly into arsenious acid by digestion with mercuric chloride, on account of the dense nature of the precipitate, but that it is readily acted upon, after dissolving out the trisulphide by means of dilute ammonia and reprecipitating with hydrochloric acid.

The oxidation of arsenious into arsenic acid by means of potassic permanganate is never perfect,* and a volumetric method based upon this reaction was found by the author to be most untrustworthy; but by adding excess of permanganate—more than double the amount required according to theory—and standardizing back with a solution of ferrous sulphate, very accurate results were obtained.

The volumetric determination of arsenic acid by means of uranic acetate in the presence of free acetic acid and an alkaline acetate, did not yield trustworthy results.

* Zeitschr. f. Anal. Chem. x. 158–183; from the *Journal of the Chemical Society.*

† Pogg. Ann. cxviii. 17, and Fres. Zeitschr. für Anal. Chemie, ii. 383.

* Gmelin, Handbuch der Chem. 4th ed. ii. p. 640.

THE ACTIVE PRINCIPLE OF POLYGONUM HYDROPIPER.

BY C. J. RADEMAKER, M.D.

Having seen hydropiper frequently used, both in the form of tincture and fluid extract in amenorrhœa and other uterine disorders, with very satisfactory results, I was induced to make a chemical examination of this drug.

In order to obtain the active principle or principles, the following processes were resorted to:—

Experiment 1*st*.—Two pounds of the herb were exhausted with diluted alcohol, the alcohol distilled off by means of a water-bath, the remaining liquid was evaporated to about one-third of the original bulk; during the evaporation a considerable amount of resinous matter was precipitated, the solution was filtered from the resinous precipitate and the filtrate treated with basic acetate of lead, which produced a yellow precipitate.

The precipitate produced was collected on a filter and washed with distilled water. The precipitated magma was then suspended in distilled water and treated with sulphuretted hydrogen; the resulting mixture of sulphide of lead and organic principle was treated with ether, the ether separated from the sulphide of lead and allowed to evaporate spontaneously.

The crystals thus formed were soluble in alcohol, ether, chloroform, and slightly soluble in diluted alcohol, but almost insoluble in water; when rubbed with water they become very sticky; the solution of the crystals had an acid reaction with litmus. Under the microscope they made a beautiful appearance, resembling the crystals of uric acid of human urine.

This acid may be called polygonic acid.

Experiment 2*nd*.—The filtrate from which the acid had been removed by means of basic acetate of lead, was treated with sulphuric acid, in order to remove the excess of lead, and then rendered alkaline by means of caustic potash and treated with ether.

The ether was separated and allowed to evaporate spontaneously. The mass thus left was perfectly white, neutral to test-paper, and had a bitter taste, was soluble in alcohol, ether, and the mineral acids; its solution in acids was not precipitated by ammonia, caustic potash, or sodic carbonate, nor was I able to obtain any crystals. From this I concluded that it possessed no basic properties.

Experiment 3*rd*.—One pound of fluid extract (480 grs. to the fluid ounce) was treated with hydrochloric acid, about five drops of the acid to each fluid ounce of the liquids, and then treated with ether. The ether separated and treated with basic acetate of lead, the precipitate produced was collected on a filter and washed with distilled water, the precipitated magma was suspended in distilled water and treated with sulphuretted hydrogen.

The mixture of sulphide of lead and organic principle was again treated with ether, the ether separated from the sulphide of lead, evaporated and the acid crystallized.

The crystals produced resembled those as prepared in experiment No. 1.

Chemical Properties of Polygonic Acid.—Polygonic acid, as prepared in experiments 1 and 3, has a green colour, acrid and bitter taste. It has strong acid properties, completely neutralizing bases, and uniting with them to form salts.

Aqua ammoniæ, caustic potash and sodic carbonate, added to the crystals or a solution of the crystals, produced an intense yellow colour, and the crystals were dissolved. Nitric and hydrochloric acids added to crystals or solution of the acid produced a yellow colour. Sulphuric acid added to the crystals or a solution of polygonic acid, produced a dark red colour, which gradually became black. Basic acetate of lead added to a solution of the acid or its salts, produced a yellow precipitate, soluble in the mineral acids. Nitrate of suboxide of mercury produced a yellowish-white precipitate, soluble in the mineral acids. Mercuric chloride produced a green precipitate, soluble in the mineral acids. Cyanide of potassium produced a yellow colour. Ferric chloride produced a slight dark colour. Cupric sulphate produced a slight green colour. Baric chloride, chloride of gold, nitrate of silver and chloride of platinum produced no change.

From the above it will be seen that the *Polygonum Hydropiper* contains an acid, crystallizable, colouring principle upon which the medicinal virtues of the drug mainly depend.—*Amer. Journ. of Pharm.*

THE POLLUTION OF RIVERS.

The Third Report of the Commissioners appointed in 1868 to inquire into the best means of preventing the pollution of rivers has been recently issued. It reveals an amount of injury done through the contamination of rivers by the refuse of manufacturing processes carried on in certain districts that to those who live in more favoured localities might appear almost incredible. A few years since a great and just outcry was raised concerning the then filthy state of the Thames. But those who lived on the banks of the Thames, even in its worst days, could have derived therefrom but a faint idea of what may be seen in certain rivers where a combination of manufacturing refuse and town sewage is being continually carried on. The report deals with the effects of the woollen manufacture on rivers and streams generally, including the clothing districts of the West Riding of Yorkshire, Gloucestershire and Somersetshire, the flannel trade of Wales, the blanket manufactories of Witney and Dewsbury, the worsted and rug factories of Kendal, and the carpet works of Kidderminster, Halifax, Rochdale, Durham and Wilton.

It would be out of place in this Journal to follow the Commissioners step by step through all their inquiries. It will be sufficient to epitomize the results of the investigation of one district and take it as representing approximately the results in others.

The first river reported upon is the Aire, the water of which, early in its course, is described as being excellent, though somewhat hard from its solvent action upon the mountain limestone through which it has percolated, and containing a larger proportion of organic matter than do the streams issuing from the chemically analogous chalk and oolite formations of the southern counties. The pollution of the Aire commences at Skipton; it then passes Bradley, Keighley, Silsden, Bingley, Allerton, Saltaire, Bradford, Baildon, Guiseley, Yeadon and Rawdon. By this time it has been fouled by the refuse of about 1400 factories and the sewage of more than a quarter of a million of people. Some of these factories are gigantic in their operations. At the principal one, that of Sir Titus Salt, the following quantities of material are used annually:—logwood and similar dye-wares, 320,000 lbs.; chloride of lime, ammonia and oil of vitriol, 15,000 lbs.; gallipoli oil, 40 to 50 tons; soap, 700,000 lbs.; alkali, 40,000 lbs.; coal, 14,000 tons. Some idea of the character of the influx from tributary streams may be formed from the description of Bradford Beck given by the Commissioners. They say that at the time of their inspection it left the town a black, filthy, offensive stream, even above the sewer outfall emitting offensive gases, and could scarcely be distinguished from the sewage itself. But the volume of water and the subsidence and deposit that is continually going on is so great, that at Kirkstall Bridge, above Leeds, the river is only moderately polluted.

At Leeds the river receives the sewage of a population now estimated at 270,000, and the refuse of at least 400 manufactories. The marked effect of such a mass of pollution, even upon a large river, is seen by a comparison of the analytical results yielded by samples of water taken at Kirkstall Bridge and below the Leeds sewer outfall. By the time the river has reached Kirkstall Bridge the soluble polluting materials have been increased in the form of organic carbon 3·33 times, and organic nitrogen 5·21 times, the proportion contained in the water at its source. This increase represents the addition of ·524 lb. of organic carbon and ·066 lb. of organic nitrogen to every 100,000 lb. of water. But in passing Leeds the river receives a further increase of ·601 lb. of organic carbon and ·045 of organic nitrogen; so that in regard to soluble matters the polluting effect of the single town of Leeds is not much less than the aggregate fouling produced by all the towns and factories above it. The nature of some of the filthy liquids contributed to the river by the town of Leeds may be judged of by the following result of the analysis of the esparto liquor from a paper mill:—Parts in 100,000: total solid matters, 4038; organic carbon, 938·845; organic nitrogen, 76·816; ammonia, 1·116; chlorine, 58. The corporation of Leeds have no jurisdiction over the Aire, which flows through the middle of the town. Twenty years ago the river was comparatively clean, now it is a black and filthy stream. Irrespective of the prejudicial influence its present state must exercise over the health of the town, considerable evidence was furnished to the Commissioners that a large money loss was thereby occasioned.

Ten miles below Leeds the Aire is joined by the Calder, and at the weir near the junction at the time of the inspection not only the water but the foam upon it was black. The river Calder at its source consists of water of considerable purity. But at Todmorden it is entered by the Migelden Brook, a stream so highly polluted by mine water as to be unfit for all purposes; it cannot be drunk, it is unfit for washing, and its corrosive action on iron is such as to prevent it being employed for feeding steam boilers. The acidity of this brook is equal to that which would be imparted by the addition of 8·075 parts of sulphuric acid to every 100,000 parts of water. The total quantity of sulphuric acid, in a free and combined state, was 19·48 parts in 100,000.

From the spot of the junction of the Aire and the Calder the history of these streams is but a repetition of what has already been said. Tributary streams bringing a mass of pollution, if possible, worse than that of the parent river; towns, whose inhabitants are sometimes numbered by tens of thousands, pouring in their sewage together with the refuse from chemical works, gas works, dye and bleach works and tan-yards. It will suffice to give here just a few descriptive sentences from the report. At Huddersfield "films of tar were floating on the surface of the foul stream when we saw it." Below Wakefield, "the river was turbid, and of a dark brown colour; an oily film floated on the surface, and the water emitted a mixed odour of sewage and gas tar." At Woodlesford the Commissioners were shown a large quantity of paper, which, at one time, had a delicate yellow tint, due to yellow chromate of lead, but which had been spoiled and changed to a dirty brown "by the gaseous emanations from the river water," used as a source of power in the paper mills. But, perhaps, the most striking proof consists of a facsimile of a memorandum, written with water from the river Calder. The writing is the colour of faded ink, and runs thus:—"Dedicated, without permission, to the Local Board of Health, Wakefield. This memorandum, written with water taken from the point of junction this day between the river Calder and the town sewer. Could the odour only accompany this sheet also, it would add much to the interest of this memorandum."

The report next deals with the West of England clothing districts; but, although the details as to the source and materials of pollution vary somewhat, the effects are substantially the same. Rivers and streams which, if they were preserved in a state of purity at all approaching that in which they leave the fountain head, would be a source of health and wealth to all the towns through which they pass, are made utterly useless and noxious to the general community.

In dyeing the "superfine black" cloths of the West of England, the manufacturer depends on a basis of indigo colouring, or woading, as it is called. It is incidentally mentioned, that for the dyeing of other tints, the magnificent colours now manufactured from coal tar, and known as aniline colours, are becoming gradually more employed in the place of various dye-woods. This, it is thought, will have some influence in diminishing the pollution of rivers, as it will reduce the amount of waste dye-woods which are generally cast into the nearest watercourse, and the residual liquids of the dye vats are of a less polluting character and more easily purified; since, unlike the aqueous extracts of dye-woods, they contain but very little extraneous matter either in solution or suspension.

(*To be continued.*)

THE THEORY OF DISSOCIATION.

BY A. HORSTMANN.*

The author traces the connection between the temperature, pressure, and the other elements which are of influence in a case of dissociation lately examined by H. St. Claire Deville. When steam acts upon iron in a closed vessel, there exists at every temperature a tendency towards the establishment of a constant ratio between the partial pressures of the steam and of the hydrogen which, while dependent upon the temperature, appears to be independent of the quantity of iron and its oxide, and of the absolute pressure of the gases. This may be explained by Pfaundler's hypothesis that in a given time there are as many molecules of water decomposed as newly formed. The author considers it admissible to suppose that, at the moment when these two reactions take place, a molecular compound $FeOH_2$ is formed, which, however, according to temperature or other circumstances, is immediately split up again either into $Fe + H_2O$, or into $FeO + H_2$. If such a compound were formed, then according to the mechanical theory of heat, the pressure of the hydrogen and that of the steam would increase according to the same law, which can be expressed by the equation—

$$dp = dT\frac{Q}{AT\delta v},$$

where A represents the mechanical equivalent of heat, T the absolute temperature, δv the volume of the liberated gas, Q the quantity of heat consumed in the process of decomposition, and dp the increment of pressure. δv remains the same for steam and hydrogen. Q can be computed from the heats of combustion. By the combination

of 16 pts. of oxygen with iron, are evolved 66,100 thermal units.
" " hydrogen " 59,200 "

so that the difference 6900

shows how much more heat is consumed when H_2O instead of H_2 is separated from the compound $FeOH_2$. Q, and consequently dp, is greater in the case of steam. Calling the pressure of the hydrogen p_1 and that of the steam p_2, we see that p_2 increases faster than p_1, and that the ratio $p_1 : p_2$ diminishes as the temperature rises; and this is confirmed by experiment.

If it be supposed that the quantity of heat which, during the process of decomposition, is consumed for internal work (this quantity, in the case of hydrogen, being called U, and in the case of iron U_2) does not vary with the temperature, then another equation can be deduced—

$$\log\frac{p_1}{p_2} = C - \frac{U}{AR}.\frac{1}{T},$$

in which $R = s_0 \frac{760}{273}$, s_0 being the molecular volume of H_2 or of H_2O, and $U = U_1 - U_2$. The unknown quantities C and U can be determined by two observations, and then the above equation will furnish the value of $\frac{p_1}{p_2}$ for every temperature.

The following table shows how far the experimental values agree with those obtained by calculation from the equation:—

Temperature.	Found.	Calculated.
200°	20·49	23·07
265°	13·96	14·01
363°	8·62	8·11
440°	5·75	5·75
860°	2·34	2·08
1040°	1·74	1·65
1600°	0·92	1·06

The value of U is found from the above equation to be −3900 heat units instead of −6900, which number would directly follow from the known heats of combustion of hydrogen and iron. But considering the sources of error to which the determinations of the heats of combustion, as well as the ratio $\frac{p_1}{p_2}$ are subject, we must be contented that the value of U, whether obtained directly or indirectly, has the same sign and is of the same order.

* Deutsch. Chem. Gesch. Ber., iv. 635, and *Journal of the Chemical Society.*

Do Sunflowers follow the Sun?—Many of the statements which are demonstrated in the progress of science to be erroneous have, as a foundation, a substratum of fact. The popular notion that the sunflower follows the sun in its course has been often combated and contradicted, but, according to Mr. J. A. Allen, one species at least of the genus *Helianthus* has this peculiarity. He says, "It is a popular belief that the sunflower always turns its flowers towards the sun, but in reality, so numerous are the exceptions to this rule in our garden sunflowers and in our common [American] wild species of the East, that few observing people regard it, doubtless, as otherwise than an idle whim. With many of the prairie sunflowers, however, the facts are different; especially is this so in the case of *H. rigidus*. Morning after morning, at flowering time, the heads of this species may be seen bending gently towards the east; they are erect at midday, and at evening gracefully droop towards the west. This continues, day after day, for weeks, with surprising regularity and uniformity; later, however, the stems grow rigid, and remain nearly vertical. In this case, at least, the popular notion referred to above seems well founded."—*Gardeners' Chronicle.*

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PRESCRIBING AND DISPENSING.

A brief communication published in the "Correspondence" of last week's Journal naturally directs our attention to the very important subject above indicated, and induces us to make sundry categorical remarks thereupon. We are content to begin with the prescriber's aspect of the question, and may, we suppose, assume his dictum to be that a prescription, once committed to paper, is to be "accurately" dispensed, without jot or tittle of change. How dubious soever the caligraphy, how absurd soever the errors, the dispensing must be "accurate," or the dispenser has failed in the fulfilment of his duty. This sort of Medic and Persianic rule, which obtains with many if not most physicians, arises, we must assume, from an idea that all the "mind" is on one side, and all the "matter" on the other. If such were positively and actually the case, we might fitly stick to the rule unswervingly, and all would be well. But we know that it is not so. In taking the dispenser's aspect of the question, we find that mental as well as physical powers have to be exercised on many occasions to a very considerable extent. Prescriptions are sent so cloudily written that it is next to impossible to decipher them; so funnily constituted as to result in a chaos of chemical combinations; and so faulty as to quantities that "accuracy" in the dispenser would inevitably result in death to the patient.

That these three sins in prescribing are committed by physicians daily and hourly, no one who has had any experience in the ways and means whereby physic is imparted to the public will attempt to deny. The evil is particularly patent, but the remedy is equally plain. It is manifestly the duty of physicians to pay more attention to caligraphy, to chemical combinations and to correct quantities. But it is as clearly and positively the duty of the dispenser to communicate with the prescriber in all cases of doubt and difficulty, whether they have reference to any one or all of the errors above indicated. It is by no means the "whole duty" of a dispenser to decipher one-half of a prescription and to imagine the rest, to remedy or supply chemical errors or deficiencies, or to reduce a dangerous dose to the innocuous point. The prescriber and dispenser may, and should, always work harmoniously; for if the latter invariably adopts the plan that we have recommended, the former will be very glad to acknowledge and appreciate that valuable sort of discretion that can, in pharmaceutical work, alone constitute the security of the physician.

THE POPPY CROP IN BEHAR AND BENARES.

We learn that the poppy crop of the past season in the Behar and Benares agencies has suffered much from excessive rains and an unusually severe visitation of blight; this blight is reported "to have been quite different from that hitherto known in Behar, which affects only the small stunted poppy, when dried up by the hot winds in March. This year the finest and strongest poppy has been attacked. It appears first to have manifested itself at the beginning of February, when the leaves of the plant began to wither and turn black, the plant eventually dying. The late-sown plant has perhaps suffered the most severely, whole fields of this having been destroyed; but the damage done to the early-sown plant has also been very considerable, while the portion that seemed to have escaped the blight has not actually been free from its effects, the capsules of such portions having dried up after two or three incisions, instead of standing four, five and six, the produce of each incision being at the same time small."

So great has been the effect of this visitation, that only 41,000 chests of opium are expected as the results of the harvest, instead of 55,724 as originally estimated. No satisfactory conclusion can be arrived at in India as to the cause of these ravages; the popular notion amongst the natives, however, "is that the excessive rain of October washed a good deal of the strength of the soil out of the land, and that the unusual heat in the early part and middle of February, together with the cloudy weather and easterly winds which prevailed, have been the main cause."

It is satisfactory to know that the Indian Government, both in India and at home, are taking steps to ascertain, if possible, the cause of this blight, the result of which we hope may be successful.

AN AMERICAN ENIGMA.

We have no desire just now to take part in the discussion of the question as to whether man has been developed from any other form of life. We simply wish to furnish an illustration of how easily he may be changed into something else—at least in name—under the printer's care, assisted by the fostering influences of illegible manuscript and inefficient supervision. The *Leavenworth* (Kansas)

Medical Herald and Journal of Pharmacy informs its readers that at the late meeting of the American Pharmaceutical Association at St. Louis,

"The Executive Committee sent in the following names as honorary members of the Association: Prof. Bedford, of London; Prof. H. B. Brady, of Newcastle-upon-Tyne, England; Prof. Attfield, London; Prof. De Weig, Hague, Netherlands; Leon Lourteman, Augusta Delamaitre, A. Chavallier, Paris, France; Prof. Adolph Duplous, Germany; H. Ludwig, Jena, Germany; Anthony Von Waldhein, Viena, Austria."

A key to the above riddle, with the exception of the fourth name, which appears to be meant for Dr. J. E. De Vry, may be found in a previous number of this Journal, p. 390.

THE ROYAL INSTITUTION.

The following lecture arrangements at the Royal Institution for 1871–72 are announced:—

Prof. Tyndall, LL.D., F.R.S.—Six Christmas lectures (adapted to a juvenile auditory) "On Ice, Water, Vapour and Air," on December 28, 30, 1871; January 2, 4, 6, 9, 1872.

Dr. W. Rutherford, F.R.S.E.—Ten lectures "On the Nervous and Circulatory Systems," on Tuesdays, January 16 to March 19.

Prof. Odling, F.R.S.—Ten lectures "On the Chemistry of Alkalies and Alkali Manufacture," on Thursdays, January 18 to March 21.

W. G. Clark, M.A., Vice-Master of Trinity College, Cambridge, late Public Orator.—Six lectures "On the History of Dramatic Literature, Ancient and Modern," on Saturdays, January 20 to February 24.

Moncure D. Conway, Esq.—Four lectures "On Demonology," on Saturdays, March 2 to 23.

Dr. W. A. Guy, F.R.S.—Three lectures "On Statistics, Social Science and Political Economy," on Tuesdays, April 9, 16 and 23.

Ed. B. Tylor, Esq., F.R.S.—Six lectures "On the Development of Belief and Custom amongst the Lower Races of Mankind," on Tuesdays, April 30 to June 4.

Professor Tyndall, LL.D., F.R.S.—Nine lectures, on Thursdays, April 11 to June 6.

R. A. Proctor, Esq., B.A., F.R.A.S.—Five lectures "On Star Depths," on Saturdays, April 13 to May 11.

Prof. Roscoe, F.R.S.—Four lectures "On the Chemical Action of Light," on Saturdays, May 18 to June 8.

The Friday Evening Meetings will commence on January 13th.

The Friday Evening Discourses before Easter will probably be given by Mr. W. R. Grove, Q.C., the Archbishop of Westminster, Professors Odling and Humphry, Dr. Gladstone, Messrs. C W. Siemens, R. Liebreich and John Evans and Professor Tyndall.

We have great pleasure in recording some further additions to the list of honours that have been conferred upon gentlemen more or less intimately connected with pharmaceutists. At the Court of Common Council of the City of London held on Thursday last, Mr. Deputy Elliott, in proposing a resolution that the thanks of the Court should be awarded to Mr. Alderman Dakin, the retiring Lord Mayor, read a letter that had been received from Mr. Gladstone, offering him, in the name of her Majesty, the honour of knighthood. At Richmond (Yorkshire), Mr. T. Thomas Thompson, Pharmaceutical Chemist and Local Secretary, has been re-elected Mayor.

Among the subjects announced for the Wednesday Evening Meetings of the Society of Arts before Christmas are, "Sewage as a Fertilizer of Land and Sand as a Purifier of Sewage," by Mr. J. Bailey Denton, on December 6; "Observations on the Esparto Plant," by Mr. Robert Johnston, on December 13; and the "Study of Economic Botany, and its Claims Educationally and Commercially Considered," by Mr. James Collins, on December 20.

An experiment in illumination is now being made at the Crystal Palace, which it is said bids fair to exercise an important influence upon our present methods of obtaining artificial light. In the oxyhydric light advantage is taken of a new method of obtaining oxygen, from manganate of soda, by heating it alternately in an atmosphere of steam and air. It is stated that by this means oxygen can be produced very cheaply. Novel arrangements of burners are used, and the light produced by them is of great brilliancy and steadiness.

The *Lancet* mentions a rumour that in the approaching session of Parliament Mr. Muntz will introduce a Bill on the Adulteration of Food, which will be free from the objections of the unsuccessful Bill of last session. It is also said that the Home Secretary will propose legislation upon the same subject.

The Royal Society's gold medal has been awarded to Dr. Stenhouse, a chemist whose name is well known for his investigation of several drugs amongst other important contributions to science.

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

The Third General Meeting of the Society was held on November 9th; the President, Mr. E. Davies, F.C.S., in the chair.

The following donations were announced:—current numbers of the Pharmaceutical Journal, and Liverpool Medical and Surgical Reports, October 1871, by Drs. Braidwood and Harrison.

The President called attention to formulæ for coloured fires, by J. R. Bramschweiger, published in the *Journal of the Chemical Society* for October, which he had prepared and tried. They were free from the danger of spontaneous combustion and obnoxious smells. The shellac used in the preparation only required to be very coarsely powdered. The following are the forms:—

Red Fire, 9 parts Nitrate of Strontia.
3 parts Shellac.
$1\frac{1}{2}$ parts Chlorate of Potash.

Green Fire, 9 parts Nitrate of Baryta.
3 parts Shellac.
$1\frac{1}{2}$ parts Chlorate of Potash.

Blue Fire, 8 parts Ammonio-Sulphate of Copper.
6 parts Chlorate of Potash.
1 part Shellac.

Mr. Alfred H. Mason, F.C.S., observed that before the reading of the paper for the evening, he wished to call attention to the name of one intimately associated with the subject, he meant Dr. Richardson. He stated that this eminent man, who has done so much to relieve human suffering, is now engaged trying to prevent, if possible, pain to animals when being slaughtered. Mr. Mason described the experiments Dr. Richardson had tried, and expressed a hope that he would be successful in his efforts.

Mr. Alfred E. Tanner then read a paper on "Nitrite of Amyl," which is printed at p. 421.

The President said that he felt a great interest in the subject, as many years back he had experimented with nitrite of amyl, and had experienced from it some very singular effects. After inhaling from a few drops on blotting-paper a peculiar sensation was experienced, a sense of dizziness, singing in the ears, the face flushed and veins throbbed until the paper was removed, when the effects disappeared. It appeared, however, to be almost without action on the lower animals. He thought that Mr. Tanner's modesty scarcely allowed him to claim the merit due to his discovery of a much improved method for making this substance, as, in his opinion, the author had shown sound chemical knowledge, and great perseverance and skill. The paper was valuable, as containing the result of original research, and he trusted that the other members would be induced to investigate new products which came under their notice, and communicate their discoveries to the Association.

Mr. Mason fully endorsed the remarks of the President, and said they were much indebted to Mr. Tanner for his important communication to the Association in the valuable paper they had just heard. The method of manufacture employed by Mr. Tanner was a good suggestion; it was rather remarkable that the same idea had occurred to Professor Maisch, of Philadelphia, and evidenced the more honour due to Mr. Tanner, in that he had successfully brought about the result anticipated. Mr. Tanner had reminded them that it was of the highest importance that these sensitive therapeutical agents should be employed in as pure a state as possible, it was therefore of importance that the pharmacist should have some reliable test; he agreed with Mr. Tanner that the boiling-point was a guarantee of purity, but thought it desirable that the boiling-point and the specific gravity should be taken together; he did not think fractional distillation was a reliable test, it could not be expected that an homologous compound like amyl nitrite would be so stable as a body having a simple composition. Ethyl nitrite distils without change, but when we get up to amyl we find the nitrite decomposing.

Mr. Tanner said Mr. Maisch published his paper some twelve months subsequently to his (Mr. Tanner's) discovery. He also observed that he used anhydrous amylic alcohol in preparing the nitrite of amyl; the process had failed when anhydrous spirit had been employed.

Dr. Symes, in proposing a vote of thanks to Mr. Tanner, said the subject was a very desirable one to know about. He thought the boiling-point was a sufficient test of purity for medical purposes, and fully appreciated the value of Mr. Tanner's discovery, as he had prepared it by the old process, and it was important to have a process by which any one with an ordinary amount of chemical knowledge might produce it. If pharmaceutical and chemical products were generally prepared instead of being purchased, much additional knowledge would be gained, and the scientific character of the pharmacist greatly elevated.

BRISTOL PHARMACEUTICAL ASSOCIATION.

Friday, November 10, 1871; a General Meeting of the Association was held this day, Mr. W. W. Stoddart in the chair.

The Chairman briefly introduced the newly elected President, and expressed the gratification he felt in resigning the post he had held for two sessions to one who would adorn it so well as Mr. Townsend.

Mr. Charles Townsend, having taken the chair, said the first duty he had to perform was a very pleasing one, namely, to distribute the prizes to the successful candidates among their students of the last session.

Mr. Arthur Little had earned—

1st prize, advanced grade, Inorganic Chemistry.

1st prize, elementary grade, Organic Chemistry.

1st prize, advanced grade, Structural and Physiological Botany.

Mr. Little had also been awarded the gold medal of the Science and Art Department of the Committee of Council on Education for his proficiency in this last subject, viz. "Structural and Physiological Botany." This was a great distinction, and an honour at once to himself, to his teacher and to the Association of which he was a member.

Mr. George W. Tamplin had earned—

1st prize, advanced grade, Organic Chemistry.

A prize, elementary grade, Systematic and Economic Botany.

Mr. Charles Bennett had earned—

2nd prize, elementary grade, Inorganic Chemistry.

2nd prize, elementary grade, Organic Chemistry.

A prize, elementary grade, Structural and Physiological Botany.

Mr. Ernest Samson had earned—

1st prize, elementary grade, Organic Chemistry.

Mr. Charles E. Bishop had earned—

2nd prize, advanced grade, Inorganic Chemistry.

Mr. Baynham had earned—

A prize, elementary grade, Systematic and Economic Botany.

The prizes having been distributed, the President delivered the following address:—

Ladies and Gentlemen,—For the first two years of its existence the Bristol Pharmaceutical Association has been under the presidency of a gentleman so well known and highly esteemed throughout the kingdom for his varied and abundant talents, and for his accurate knowledge of the several sciences immediately connected with pharmacy, that *any one* may be excused for feeling considerable diffidence in occupying the post of his successor; and as I make no claims to be considered a *scientific* president, I must rely upon your kindness to receive the few remarks I have to make this evening with some little indulgence.

We commence to-day the third session of our Association; it has been upon its trial for two years, and the time is fitting to ask what has been accomplished, in what respects our objects have succeeded, and in what respects we have failed?

That there has been conspicuous success is evident enough from the pleasant duty I have had to perform this evening; and those of you who have given the greatest attention to, and felt the warmest interest in our Association, well know that there have been very many failings also.

We have in our city about eighty members of our profession, and it is gratifying to notice, that of this number no less than fifty-seven were last year associated with our Society; and I venture to hope that all, or nearly all the rest, will come in and assist us in the work of establishing in Bristol a thoroughly efficient school of scientific pharmacy. This, then, is one element of success; there is an increasing interest in the objects we have at heart on the part of those actually in business, and who, I would have all the students to remember, can themselves derive but small benefit from our labours.

It is for those who, as one by one we grow old and weary in the work, come in and fill our places, to reap the fruits of labours which for thirty years have been incessant, and which now we are endeavouring to carry home to all.

To a large extent we may consider also that the provision which has been made for scientific instruction in the past two years has been successful; no society can have two more able professors than Messrs. Coomber and Leipner, the character of their instructions and their value to those who are really in earnest in availing themselves of their lectures may be gathered from the high position which several of our students have taken. During the present year we are able to supplement the two courses of lectures on Organic and Inorganic Chemistry by Mr. Coomber, and the course of lectures on Botany by Mr. Leipner, by what, I cannot but say, I think of equal value and importance. I refer to the course of lessons on the Chemistry, Botany, and Materia Medica of the Pharmacopœia, which has so kindly been undertaken by your late President, Mr. W. W. Stoddart.

I should feel that I was utterly failing in my duty if I did not express the deep obligation we are all under to one of our best and kindest friends, and I must ask those of our students who are availing themselves of Mr. Stoddart's most able and voluntary services, to reward him in the way which I am sure he will deem the best and most congenial, namely, by a *patient, diligent and earnest* attention to his valuable instructions.

We have all felt the interest that has attached to the public monthly lectures given during the past session; they have been worthy of a scientific society, and in every way successful; and I am pleased to tell you that several of the gentlemen who assisted us last year (including Dr. Tilden) have again yielded to the winsome wiles of our honorary secretary, and we may look forward with pleasure to another opportunity of sitting at their feet to learn.

Now, gentlemen, I must unwillingly turn to the other side of the picture and point out what we feel are some of the failings of the past, doing so only that I may stimulate each one of us to help to remove them in the future. And the first difficulty which meets us, one very serious in its aspect, is the large proportion of students who fail to pass the Preliminary examination.

An immediate remedy for this is out of our power, but to those pupils who have suffered from a defective early training—possibly and probably from no fault of their own—I would say, put your shoulders to the wheel at once, and do not rest contented until you have fairly crossed the bridge and acquired that which you can readily attain if you are in earnest in seeking it. And as to those of us who are employers, it is clearly no part of our duty to turn schoolmasters; with the materials we now have we must do the best we can. I cannot but think it will be the bounden duty of every pharmacist in future *absolutely to refuse* to accept any pupil who is not able when he is apprenticed to pass, or who has not passed, this examination.

It must not be supposed that we, as pharmacists, are singular in this matter, the same complaint is made by the examiners for all the professions and for the Civil Service; and it is perfectly astounding to find the number of candidates presenting themselves whose arithmetic is a dreamy chaos, and whose spelling might be either Welsh or Chinese, but is certainly not English.

It is to be hoped that the golden age is dawning, and that the first streaks of day, ushered in by the Education Bill, will by-and-by open out into a noon of bright and sunny light for all.

Passing on, I consider we have in the past failed to some extent in calling out and *sustaining* the personal interest of the students in our work, and I think this, in great part, arises from the want of a museum and library. Time and money can alone remedy this, and the subject is now occupying the very earnest attention of the Council; and, with the hearty and practical support of all our brethren, we hope, at no distant day, to have a school of pharmacy in Bristol, possessing a museum and library worthy of the chief city of the west. I should like to see attached to it a reading-room *of our own*, open every day, *comfortable, cheerful* and *attractive*, where all could meet and obtain, by mutual contact and pleasant intercourse, that personal interest and acquaintance which is the surest remedy for all jealousies and disagreements.

Another source of regret, which we venture to hope may pass away in the future, has been alluded to in the admirable report drawn up by Mr. Schacht, and published in the PHARMACEUTICAL JOURNAL in July last, namely, the deficiency of practical papers supplied by members at the evening meetings for discussion.

I think this may be, and ought to be remedied and I would venture to suggest the plan which I observe has been adopted by the Philadelphia College of Pharmacy,—"The appointment of a small committee, whose duty it shall be to propose subjects for discussion whenever there is a lack of material contributed by members." There are many of our members who have been conspicuous by their silence, and many others who have been equally conspicuous by their *absence*, and I would urge upon both classes to relieve the cares of the Council by their friendly and frequent aid and presence.

I fear, ladies and gentlemen, you will think I am in a grumbling humour, but you know that an Englishman is essentially a "growling animal," and if you will permit me one more growl, I will have done with this part of my subject. This time I complain for *others;* for those whose interest and training we have at heart, and for whose especial benefit we form our various local associations and schools.

"I have no time," is the not altogether unreasonable wail of assistants and apprentices alike; and it must be conceded that in many instances, the bane of our business, the great hindrance to progress and to study, is the long, and, as *I* believe, the *needlessly* long hours of labour.

No rule can possibly be laid down for uniform closing, and many difficulties lie in our way; nevertheless, I am disposed to think that much remains to be done, and that with an earnest and united effort, the hour of closing may be fixed at a point at which all the strength and energy of the human frame are not absolutely exhausted. I venture to suggest that our Hon. Secretary should call an early meeting of our members specially to consider this subject, and, if possible, to come to some resolution which shall relieve our pupils and assistants a little earlier than is generally the custom at present. I do not consider that in the majority of cases, any of our establishments need be kept open after eight o'clock, and that in very many the workers may be, and ought to be relieved an hour earlier than this.

I have thus endeavoured to review the past history of our Society, and you must all feel with me that the balance is largely on the side of progress, and that we have cause for congratulation that in so short a time so much has been accomplished. Let me say to our students: throw your hearts into your work; do not be satisfied with the acquirement of just as *little* knowledge as will enable you to *scrape* through your examinations. You have a noble calling, and the widest range of science lies before you. In every shady glen and mossy bank there are fascinations for your minds; all nature is at your feet, every clime contributes something to your material for study and research; nothing is hidden from the earnest seeker in the mines in which you labour; every leaf and stem has lessons for you; it is yours to test every principle at work in the marvellous world of chemistry. Day by day opens up some fresh revelations, the line between organic and inorganic chemistry grows thinner and thinner, and the dreams of alchemy are as nothing compared with the possibilities which are yours, and it may be safely said that there is no profession which tempts to so many "fair fields and pastures new" as that in which you are engaged.

Of one thing let me warn you—there is danger in the very perfection of your training—danger in the knowledge you seek to gain, and which I hope you will rapidly acquire. Do not, I pray you, let the extent of your acquirements, or the breadth of your education, make you afraid of honest and humble toil.

This is the rock upon which many a fair ship has been hopelessly wrecked and gone to pieces. There is a dignity in labour consistent with the very highest acquirements and the greatest research. Never be ashamed of your daily work, and do not miscall it drudgery; make it your daily delight; seek in it opportunities for putting to a practical use the knowledge you have gathered; and remember there is no happiness so real and great as that which comes from a day's work well done, a day's duties nobly fulfilled, and an evening's rest well and truly earned.

I must now, ladies and gentlemen, ask your attention for a short time to one or two general questions affecting the interests of pharmacy, and then take some note of its progress during the past year. And, vexed question as it is, and threadbare as the discussion has been worn, it is impossible for me to pass over the poison regulation question without notice. I fear the lull which at present relieves our minds, is but the calm before the storm, and that when the time comes, we shall hear again the rising gale. I regret, gentlemen, most sincerely the decision arrived at by the Pharmaceutical Society at its last annual meeting, conceiving it to have been an error both in principle and policy; and with the absolute certainty, as it appears to my mind, that legislation will be enforced if we do not carry out the Pharmacy Act in its integrity, an Act granted "on the tacit but distinctive understanding that the Pharmaceutical Council should frame a code of regulations to be approved of by her Majesty's Privy Council," I earnestly trust that wiser counsels may prevail in the future.

It would be a curious comment upon the course advocated by the champions of "recommendations only" to ascertain by how many of them these recommendations had been carried out. I venture to predict it would be by a very small proportion. I am a firm advocate for regulations made and enforced by the Pharmaceutical Society under the sanction of the Privy Council.

We know what is needful and practicable, and can frame these regulations far better than they can be done for us by Parliament; but, unless this be done at once, I greatly fear it will be too late, and that all control will be taken out of our hands. But, whatever comes in the future, I hope nothing will arise to make any real or lasting breach in our own ranks; and, though we may differ widely, I trust all will consent to sink individual opinions in order in the best and speediest manner to secure the safety of those whose lives are intrusted to our care and skill.

I now approach the second portion of my subject,—a short *résumé* of the more prominent additions to pharmaceutical materials made during the past year; and I confess I wish this had fallen into abler hands. I shall be content, however, if, in my passing notice, I indicate some objects to which your attention may be profitably directed during the session.

And, although not entirely new, the prominence which has been given during the past few months to the therapeutic value of the "Nitrite of amyl" induces me to place it first on my list.

Nitrite of amyl, $C_{10}H_{11}O, NO_3$,* is an amber-coloured fluid, prepared by the action of nitrous or hyponitric acid on amylic alcohol. In the PHARMACEUTICAL JOURNAL for April last† were published some notes on its preparation by Mr. John M. Maisch, in which it is pointed out that the process for the preparation of this compound consists of two distinct operations; first, the production of the amyl-nitrous ether, and, secondly, its purification. In both operations the *very gradual* application and increase of heat is very essential.

Another process of manufacture consists in distilling amylo-sulphate of potash with nitrate of potash.

Dr. Richardson, to whom so much is due for his researches and discoveries in therapeutic science, and to whom, as is well known, we owe the introduction of hydrate of chloral, says of nitrite of amyl that it causes "paralysis of the chain of organic nerves, which supply the contractile power of the blood-vessels."

It thus induces muscular and arterial relaxation, increasing frequency of cardiac pulsation, accompanied by a very marked and sudden flushing of the face, warmth of head, face and neck, and perspiration, the perspiration often becoming general.

The safest method of administration appears to be by inhalation; five drops poured on a piece of lint, and held to the nostrils for ten or twenty seconds, until the face begins to redden. In from eight to twelve seconds the frequency of the pulse rapidly increases, rising sometimes from twenty beats in the quarter minute to forty.

Occasionally it produces some giddiness and headache; and it is evident that caution need be exercised in its employment in many cases.

In a most interesting paper by Mr. Talfourd Jones, published in the *Practitioner* last month, its physiological action and medicinal uses are most ably treated; and as we are expected to know not only the chemical properties of the remedies we dispense, but something also of their effects, and the purposes for which they are employed, I will read one extract, premising only that Dr. Jones has used the nitrite of amyl with some considerable success in spasmodic asthma, angina pectoris, epilepsy, laryngeal spasm and facial neuralgia, and that his investigations lead him to suppose that amyl is an antidote to the poison of chloral and ergot, and that it is likely to be a valuable agent in cases of overdosing by chloroform.*

A most singular and striking experiment follows, which clearly shows the effect of the nitrite upon the circulation.

Dr. Jones having cupped a patient suffering from dangerous illness, found the blood flow very slowly, and at length it ceased to run. At that moment it occurred to him that it would be interesting to watch just then the effects of the nitrite. Ten drops were immediately applied on some lint to the nostrils. Soon the radial pulse throbbed, then the face became flushed, and *at the same instant blood flowed freely into the cupping-glasses.*

It seems probable, gentlemen, that this remedy may become extensively employed; it is needful to be very cautious as to its absolute purity, as some of the specimens examined by Mr. Umney appear to have been very imperfectly prepared.

Some considerable attention has also been drawn to the wood and bark of a shrub known as "Condurango," grown in the province of Loja, Ecuader, and which is said to possess powerful medicinal virtues, and in the hands of Dr. Bliss and several other American physicians to have proved almost a specific for cancer.

Upon examination no crystalline alkaloid or active principle was separable by the usual methods, and by distillation no volatile oil or acid was obtained.

A small supply has been sent over to this country, and it has been tried at Middlesex and St. Bartholomew's Hospitals, and there does not appear to be any confirmation of its alleged virtues. Physiologically it appears to be practically inert, and its therapeutic effects in the treatment of cancer *nil.* The fear is lest some speculative and unscrupulous Yankees should vaunt it as a specific, and by a vile system of exaggerated puffing lead many unhappy victims of one of the worst diseases to which flesh is heir to seek impossible relief in a useless drug. If this should prove the case, it is well that we should know that condurango is pronounced most decidedly by English surgeons who have fairly tried it, and notably by Mr. Hulke, of Middlesex Hospital, to be worthless.

Passing to discoveries of apparently much greater value, you have probably many of you followed to some extent the interesting experiments of Dr. Richardson on the organic hydrides. Within the last month he has introduced to notice a new anæsthetic, which appears likely to prove very useful in short surgical operations.

* $C_5H_{11}NO_2$, according to the new notation.
† 3rd ser. vol. i. p. 865.

* See page 215, Case 1, *Practitioner* for October, 1871.

Dr. Richardson proposes to call this substance hydramyl-chlor., and I have a specimen of it on the table prepared for Dr. Richardson by Mr. Robbins. I cannot do better than give you a description of its preparation and effects in the doctor's own words:—

"Hydramyl-Chlor.

"In making bichloride of methylene, we place a mixture of alcohol and chloroform in contact with pure zinc. On the application of heat there is set up a brisk action, during which an equivalent of chlorine from the chloroform ($CHCl_3$) passes to the zinc, and, after a free escape of gases, bichloride of methylene (CH_2Cl_2) distils over. On my request, Mr. Robbins, while manufacturing some bichloride of methylene, added to the materials in the retort prepared for making the bichloride about eight times the volume of amyl hydride. The result was an immediate brisk action without the aid of heat. A copious stream of gases first passed over, and then, the fluid in the receiver having risen in temperature, there began to distil a compound fluid, very light specifically, and of a most agreeable odour. Collecting some of this fluid, I found it had a specific gravity of ·699, and that it commenced to boil at 92° F. It was much more manageable for inhalation than the simple hydride; was stable, and acted excellently as an anæsthetic. After carefully testing the vapour of this compound, I administered it fourteen times in cases of extraction of teeth, and with results almost identical with those that followed the administration of simple hydramyl.

"Finally, in repeating the process of distillation, the first portion that distilled over was set aside, and none was collected until the temperature had reached 90°, the temperature being sustained between that degree and the degree of temperature of the human body (98°). By this means there was obtained a fluid still very agreeable to breathe and extremely rapid in its action. This fluid has the specific gravity of rectified ether, viz. ·725. It boils in the warm hand, and may be considered as containing one part of bichloride of methylene in nine of amyl hydride. I propose to call this fluid 'hydramyl-chlor.' I administered the vapour of this fluid for the first time for a surgical operation on July 3. The patient was a young woman who wished to have a large firm molar tooth extracted. I placed two fluid drachms of the fluid in an inhaler specially constructed for it, and let the patient take the inhaler in her own hand and administer to herself. There was good anæsthesia in forty seconds, and ten seconds later Mr. Matthews took out the tooth without causing the least pain. The recovery was complete within the minute, and was neither attended with vomiting nor nausea. Since this case I have continued to administer the same form of vapour in short operations, and, so far, have every reason to be satisfied with the results. I have administered it to children as young as four years, and to adults of different ages up to seventy, and of both sexes. Mr. Matthews has also administered it a great many times for tooth-extraction at the Marylebone Dispensary with success equally good."

I can only just name the introduction of the organic bromides into pharmacy; they appear not unlikely in the future to occupy an important place, but my time and your weariness of my dry subjects must be my excuse for reserving a detailed notice for some future opportunity. Specimens of the bromides of quinine, morphia and strychnia are on the table. I will only name, as it may be a guide to some present, that the usual dose of the bromide of quinine is one grain, bromide of morphia one-eighth of a grain, and bromide of strychnia one-thirty-second of a grain.

Dr. Richardson states that they are soluble without the addition of any acid, but in practice we have not found this the case, and it is needful to add a small quantity of hydrobromic acid to each when preparing solutions or syrups from them.

Very recently attention has been drawn to the therapeutic value of theine—a substance, as you are aware, existing in tea and coffee, and which, up to the present time, has been looked upon rather as a chemical curiosity, than as a medicinal agent. It is a powerful tonic and stimulant, and a writer in the *Medical Times and Gazette* (Mr. Lewis Thompson) claims for it "the tonic virtues of disulphate of quinine united to the stimulating power of wine, but with this difference, that the stimulus from theine is not followed by any depression, as is the case with wine and alcohol."

It has been found useful in hemicrania, neuralgia and relapsing fever; and in cases of an over-dose of opium, it appeared to relieve the narcotic symptoms very speedily.

It is estimated that more than 140 tons of theine are wasted every year in the process of coffee-roasting, and Mr. Thompson states that by some modification of the the apparatus used for this purpose, theine may be produced at a cost of a few pence the ounce. By the present method, its cost is 15*s.* or 16*s.* an ounce. The dose which has been administered is from 1 to 5 grains. The specimen I have here is made by the old process; but I am informed that if the demand were sufficient, it could readily be manufactured in the manner indicated at a very small cost.

If it proves to possess the virtues attributed to it, we may soon expect a very formidable rival to cinchona products.

There appears to be a possibility that hydrate of chloral has seen its best days; for in some experiments conducted by Dr. Otto Liebreich, of Berlin, he has produced a new substance, to which he gives the name of "croton chloral," and which is produced by conducting chlorine gas into allylene. It has the peculiar effect of producing at first a high degree of anæsthesia in the head, whilst sensibility in other parts of the body remains intact. Some experiments have been tried with it in the university of Berlin and upon the insane, and it promises to produce all the good effects of hydrate of chloral, without any drawback to its judicious use. I am not aware that, up to the present time, any sample of it has been introduced into this country.

I must now apologize to you (and especially to the ladies present) for my dry address. I fear many of the latter have heartily wished that they had stayed at home; unless, indeed, any of them contemplate following the example of a Chicago virgin and entering into the ranks of pharmaceutical chemists. I think it possible the day may come when we shall have to welcome some of them at Bloomsbury Square; and you are well aware, gentlemen, that when the ladies once get either into our hearts, our pockets or our professions, there is no possibility, and I will add, very little desire, ever to get them out again.

BIRMINGHAM AND MIDLAND COUNTIES CHEMISTS' ASSOCIATION.

The adjourned Monthly Meeting of the Council of this Association was held at its rooms, 24, Quadrant, Birmingham, on Friday, the 17th inst.; Mr. Geo. Dymond, the President, in the chair.

It was resolved at this meeting that the winter Conversazione be held at the Assembly Rooms of the Royal Hotel, Birmingham, and the rooms have since been engaged for Tuesday, the 6th of February. Free cards of invitation will be issued to *all members*, each admitting a lady and gentleman, and to associates, admitting a gentleman; and a certain number of invitations will also be issued to many of the medical and scientific gentlemen of the neighbourhood. (Intending members are requested to enrol their names as early as possible.)

A portion of the rooms will be devoted to an exhibition of objects of pharmaceutical, medical and scientific interest. Intending exhibitors who desire to avail themselves of this opportunity of bringing any specimens, instruments, preparations or other articles under the notice of those who will be present, are requested to communicate early with the Secretaries, Messrs. J. Lucas and W. R. Jones, 24, Quadrant Chambers, Birmingham.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

Thursday, November 16, 1871; Dr. ODLING, Vice-President, in the chair.

The ordinary business of the Society having been transacted, the SECRETARY proceeded to read a paper "On Burnt Iron and Steel," by W. H. Johnson, B.Sc., in which the author commented on a former paper on the same subject by Mr. Williams, stating it to be his opinion that the steel became burnt through the agency of the carbonic acid present, and not through there being any free oxygen in the hottest part of the furnace. Mr. S. Bell had found that the oxidizing effect of the carbonic acid and the reducing action of the carbonic oxide went on simultaneously, varying, however, with the temperature; so that if the carbonic acid were present in sufficient quantity, its oxidizing effect would exceed the reducing effect of the carbonic oxide, and the iron or steel would become burnt.

An interesting discussion ensued, during which Mr. RILEY mentioned several curious facts which he had observed during his experience.

Mr. F. W. HART then gave a description of an improved form of siphon, and, finally, the meeting adjourned until December 7, when a paper will be read by Dr. Gladstone "On Essential Oils."

SOCIETY OF ARTS.

DYES AND DYE-STUFFS OTHER THAN ANILINE.*

BY DR. CRACE-CALVERT, F.R.S.

LECTURE II.

Red Colouring Substances (continued).—Munjeet; Campechy Peach, Sapan, Cane and Bar Woods; Alkanet Root; Safflower; Cochineal, Lac Dye; Murexide.

Munjeet.—It is to the researches of Dr. John Stenhouse, one of the most eminent and learned of English chemists, that we are indebted for our knowledge of the true composition of many of the dye-stuffs, and it is to him that we are indebted for the whole of the information we possess in the colouring matters of munjeet, or *Rubia munjista.*

This peculiar variety of the genus *Rubia* is cultivated exclusively in Asia, and especially in India, where it has been used as a dye-stuff for a long period of time, either alone or mixed with other dyes, to produce a variety of red shades. It is imported into this country from time to time, but has never been extensively used, as the colours produced from it are neither so fast nor so bright as those obtained with *Rubia tinctorum.*

Whilst the colouring principles of madder are purpurine and alizarine, those of munjeet are purpurine and a yellow colouring matter, named by Dr. Stenhouse munjistine. He has assigned to this latter body the formula $C_{16}H_8O_6$. When crystallized from an alcoholic solution, it forms large, beautiful, golden-coloured flakes, which, sublimed, give prismatic crystals of an orange-red colour. It is only slightly soluble in cold water, but freely soluble in hot water. Its best solvent is bisulphuret of carbon, which was employed with success by Dr. Stenhouse in separating the purpurine and munjistine from the other substances existing in munjeet. He states that the munjeet root contains as much colouring matter as the *Rubia tinctorum,* and, according to Mr. Higgins, of Manchester, it yields from 52 to 55 per cent. of a garancine; but as it has only half the dyeing power of ordinary garancine, it cannot be employed with advantage for this purpose. The inferiority of munjeet arises from its containing only the comparatively feeble colouring matters, purpurine and munjistine. Munjeet is not much used by calico printers, as the munjistine gives a brownish purple with salts of iron, which prevents it being employed with that mordant. It is used for special shades of Turkey red, the munjistine giving, with salts of alumina, an orange-yellow colour, which is in some instances employed by the dyers.

I have now the pleasure of calling your attention to an important class of dyeing substances, "the dye-woods."

Campechy or Logwood.—This wood, obtained from a large tree of the leguminous family, called by the botanist *Hematoxylum campechianum,* grows abundantly in the West Indies, Mexico and other states of South America. The best quality is imported from the Bay of Campechy, in the Gulf of Mexico. Large quantities are also obtained from Jamaica and St. Domingo. The qualities obtained from Honduras, Martinique and Guadaloupe are inferior.

Campechy was introduced into Europe by the Spaniards, but it was not till the reign of Elizabeth that it came into use in England, and then only for a short period, after which its employment was forbidden under the severest penalties for upwards of a century.

The discovery of its colouring principle, hematine, was made in 1810, by my learned and venerable master, M. Chevreul (who, although now 85 years old, is still actively engaged in scientific pursuits). Shortly afterwards it was studied by Ermann, who gave it the name of hematoxyline. It was obtained by these eminent chemists as yellowish-white prismatic crystals, which become discoloured by contact with the oxygen of the air and the small amount of ammonia which the atmosphere contains. It is only slightly soluble in cold water, but much more so in hot. It is very soluble in alcohol, ether and bisulphuret of carbon. It combines with three equivalents of water, forming a crystalline hydrate, which at 212° F. retains one equivalent.

Hematine in the presence of oxygen, especially under the influence of alkalies, assumes a beautiful purple colour. This colouring-matter can be obtained under the form of purple-black crystals, having a metallic lustre, and has received the name of hematëine. Hematine has the formula $C_{16}H_{14}O_6$, which, on conversion into hematëine, becomes $C_{16}H_{12}O_6, H_2O$. The hydrate is $C_{16}H_{14}O_6, 3H_2O$, which, at 212° F., becomes $C_{16}H_{14}O_6, H_2O$.

The oxidation, and consequent coloration, of hematine under the influence of oxygen and alkalies, is so rapid that it may be used as a most delicate test of the presence of carbonate of lime in natural waters; and it is a fact well known to practical dyers that waters containing a large quantity of carbonate of lime are well adapted for the production of good logwood blacks. Hematine gives little or no coloration with salts of protoxide of iron, but hematëine gives a dark purplish blue; the latter also gives dark blue precipitates, with salts of lead and tin. Hematëine is easily reduced to hematine by hydrogen and sulphuretted hydrogen.

In my opinion the colouring matter in *Hematoxylum campechianum* exists in the state of a glucoside, for when the trees are felled the wood is colourless; but by the time the logs arrive here the outside is of a dark red colour, whilst the inside has only become of a pale yellow colour.

As hematëine is the principle which the dyer requires,

* Cantor Lecture, delivered Tuesday, Feb. 14. Reprinted from the *Journal of the Society of Arts.*

the logs are ground into a coarse powder, which is moistened and laid in beds 15 or 20 feet long by 10 or 12 broad, and about 3 feet thick. A slow fermentation ensues, by which the glucoside is decomposed, and the hematine liberated. It is converted into hematëine by stirring the mass, thus exposing it to the oxygen of the air, the action being quickened by the ammonia of the atmosphere, as well as by that given off by the decomposition of the azotized principles existing in the wood.

This prepared wood is used by the dyer to produce logwood blacks, as I shall describe further on, and also by wood-extract manufacturers, who prepare an extract which is much used in calico printing. To prepare this extract it is necessary that the wood should not be too highly oxidized, and that the solution obtained from it by successive and repeated lixivation should be slowly concentrated at a comparatively low temperature, that is to say, not exceeding 150° F.; for if a high temperature be employed the hematëine is still further oxidized, and a dark purple resinous principle produced, which spoils the brilliancy of the colour.

This extract is chiefly used in print-works, to produce purples in steam styles.* A strong logwood solution is thickened with starch, and printed on a prepared cloth; that is, a cloth that has been passed through a solution of stannate of soda, then through weak vitriol, by which means the binoxide of tin has been fixed as a mordant in the fibre of the cloth; the fabric, after washing and drying, is ready for the printer. After being printed, the cloth is either rolled on a perforated cylinder or hung in an iron chamber, and submitted to the action of steam, when the hematëine combines with the oxide of tin, producing a beautiful purple.

If blacks are to be produced, an iron mordant is fixed on the fabric, which is then passed through a logwood solution. It is afterwards washed, and the black fully developed by passing it through a hot dilute solution of bichromate of potash.

Logwood and its extract are much used in Yorkshire for producing cheap blacks on mixed fabrics, which are goods in which the warp is cotton and the weft woollen. The black is produced by dyeing the fabric in a bath composed of logwood, sulphate of soda and bichromate of potash.

It is often very useful to distinguish logwood blacks from sumach and other fast blacks, and logwood purples from aniline purples. This is easily effected by submitting the piece to the action of weak acids; the logwood colours assume a bright red tint, while the others remain unchanged.

Brazil Wood.—We shall now pass on to a series of woods which are all obtained from the genus *Cesalpinia*, belonging to the Natural Order *Leguminosæ*.

Although these woods have long been employed as dyes by the natives of the countries where they grow, it is only since the introduction of Brazil wood by the Spaniards that their value as dye-stuffs has been known in Europe. The best qualities are all imported from Brazil. The particular wood known as Brazil wood, derived from *Cesalpinia braziliensis*, has become scarce in the market, from its having been all cut in the districts within easy distance of shipping ports.

The woods most in favour at the present day comes from Pernambuco, and is the *Cesalpinia Christa*. This tree is also found in Jamaica. That obtained from Sierra Nevada is not of such good quality.

Another variety, bearing the name of peach-wood, is chiefly derived from Nicaragua. A third, known as Sapan-wood, comes principally from Siam, the East Indies and other eastern countries. A rather inferior quality, known as Lima-wood, is imported from Peru.

All these woods appear to contain the same glucoside, and, like the previous ones, are decomposed by peculiar ferments into a saccharine matter and a colour-giving principle. This is proved by the following experiments. If the decoction obtained by treating the wood from the interior of the sticks be boiled with a solution of double tartrate of potash and copper (the best known test for grape sugar), no precipitate is obtained; while, if the glucoside be first decomposed by boiling with a dilute solution of hydrochloric or sulphuric acid, and afterwards treated with the copper salt, an abundant precipitate of suboxide is thrown down. The decoction, which has only a faint yellow colour, gives a most abundant and brilliant precipitate with subacetate of lead. The colour-giving principle was discovered by M. Chevreul, who gave it the name of *braziline*. By oxidation it is converted into *brazilëine*. It also combines with water, to form a hydrate containing two equivalents of water. Professor Bolley gives the formula of braziline as $C_{22}H_{20}O_7$, and that of the hydrate $C_{22}H_{20}O_7, 2\,H_2O$. He has also made the curious observation that a comparison of the formulæ of hematine and braziline shows a difference equal to carbolic acid, as may be seen by the following table:—

Braziline	$C_{22}H_{20}O_7$	
Hematine	$C_{16}H_{14}O_6$	
Difference	$C_6\,H_6\,O$	Carbolic acid.

What is still more remarkable is, that by the action of nitric acid upon hematine, he obtained oxalic acid, whilst under similar circumstances braziline yields oxalic acid and picric or trinitrophenic acid, which is the product obtained when carbolic acid is acted upon by nitric acid.

A decoction of any of these woods becomes yellow or orange (according to the quantity of braziline or brazilëine it contains) on the addition of an acid, and by the addition of an alkali, a beautiful crimson red, the shade of which varies according to the proportion of the two principles. It also becomes red with bichromate of potash, and gives a red precipitate with oxymuriate of tin.

These characters are sufficient to distinguish between a solution of these woods and one of logwood.

To prepare a good commercial extract from these woods, they must be finely ground, as they yield their colour to water with difficulty; like logwood, they must be allowed to ferment and oxidize in the air, but not to the same extent. The concentration of the decoctions differs from that of logwood in the fact that they can bear a higher temperature. The more quickly they are evaporated, the brighter are the colours which the extract gives. Dr. Dingler has proposed a process which is stated to give very good results. It consists in adding 4lbs. of gelatine, dissolved in water, to every cubic yard of ground wood, and allowing the whole to ferment for several days. The wood so treated yields a stronger and richer extract than that obtained by the ordinary process; no doubt the gelatine helps the decomposition of the glucoside, and the ammonia produced facilitates the oxidation of the braziline. By the addition of a small quantity of chlorate of potash to the hot extract, Mr. Peak greatly increased its brilliancy, and rendered it more valuable to the printer on account of the brighter colour produced on the fabric.

These extracts are principally used to obtain pinks and reds in steam styles. To effect this, acetate of alumina, chloride of tin, oxalic acid, or acetate of copper is added to the extract, and printed on the prepared cloth already described, which is then submitted to the action of steam.

These woods are also used in conjunction with a little quercitron, or bark, in the production of cheap garancine styles. These inferior garancine prints are easily

* Calico printers employ the word style or govels when speaking of a class of goods which are denoted by a word characterizing the colouring matter used, or the method employed in producing them. Madder goods and garancine styles may be given as examples of the first, and steam styles of the second.

distinguished from the good ones by means of a hot soap-bath, which only slightly affects the good, while the inferior are almost entirely destroyed. The woods also are sometimes used for the adulteration of garancine.

I may state, before leaving this subject, that the decoction of these woods yield very beautiful pink lakes, which are principally used by paper-stainers.

Common red ink is also prepared by adding a little alum and acid to an aqueous solution of these woods.

(*To be continued.*)

Parliamentary and Law Proceedings.

Death from Opium-eating in a Workhouse.

On Thursday, November 16th, an inquest was held at the Salford Workhouse, concerning the death of Elizabeth Owen, aged sixty-eight, an inmate.

Mr. John Tatham, medical officer to the workhouse, said, on the evening of the 14th inst. he was sent for by one of the day nurses to visit the deceased. She was in bed, and almost insensible. He endeavoured to rouse her, but could only do so partially. From her appearance he suspected she had taken an overdose of opium. He ordered her to be got out of bed, and to walk about the room for some ten minutes to keep her awake, and while an emetic was being prepared. An emetic was administered to her, and he afterwards used the stomach-pump, but the emetic did not act. The deceased had gradually become more insensible, and died about nine o'clock. He made an examination of the body, and found the vessels of the brain enormously loaded with blood, quite sufficient to account for death. He was clearly of opinion that congestion was the result of her having taken a narcotic poison. He did not think it necessary to examine the stomach, as in all probability the traces of opium would have been removed. Deceased could only have got opium in sufficient quantity to produce the effects he saw from outside the house. It was contrary to the rules of the house to import anything whatever into it for the use of the inmates. He perfectly well remembered having taken more than ordinary notice of the deceased when he went his rounds on the day of her death. The medicine she was taking contained but a small quantity of opium, and she might have taken all that was in the bottle without any ill effects following. No other poison would, he thought, produce all the symptoms he found, coupled with the congestion of the brain.

Evidence was given by a paid nurse that in August last she received a piece of opium, about three times the size of a pea, from one of the male inmates with a request to give it to deceased. Witness handed it to the superintendent. Upon deceased being spoken to about it she promised not to offend again. Another nurse said that she had received a piece of opium from deceased which she gave to the superintendent. It was also stated that deceased was in the habit of taking laudanum before she went into the workhouse.

The jury returned a verdict in accordance with this evidence, and the coroner wrote a letter to the Salford Board of Guardians, calling attention to the great probability, almost amounting to certainty, that the deceased was supplied with opium by other inmates, who were from time to time allowed to leave the house temporarily.—*Manchester Courier.*

Adulteration of Bread by Alum.

At the Manchester police court, on November 17th, three bakers appeared in answer to summonses, upon a charge of mixing alum with the bread made by them. The prosecution was instituted by the Manchester and Salford and District Master Bakers' Association, and one of the defendants was a member of the Association. Evidence was given as to the purchase of certain loaves, which were ticketed and sent to Mr. Jones, Owens College, for analysis.

Mr. Jones said he had examined the loaves with the following result:—One loaf contained 6·41 grains of alum per lb.; a second 5·75 grains per lb., and the other 5·55 grains per lb. The quantity of alum was sufficient to produce some effect upon a person eating the bread.

The cases were adjourned for a month.

Death from an Overdose of Chloral Hydrate.

An inquest has been held at Leicester to inquire into the circumstances attending the death of Mrs. A. Turner. A servant in the employ of the deceased deposed that being unable to obtain an answer from her mistress the room was entered, when Mrs. Turner was found dead in her bed, and a bottle labelled "Syrup of Chloral Hydrate," lying near her.

Samuel Goodhall Cox said, I am a chemist and druggist, residing in Gallowtree-gate, Leicester. I knew the deceased lady, from her having been an occasional customer. On Monday evening last, between five and six o'clock, she came to my shop alone, and asked me for the mixture of chloral hydrate, which she had had before. On my giving the mixture to her in a four-ounce bottle, the deceased asked me if I would make it of double strength. She said she had taken two teaspoonfuls of the mixture she had had before, and she wanted to have the dose in one teaspoonful. I prepared the chloral hydrate as the deceased wished, and had no hesitation in doing so. I particularly impressed upon her that I had made it double the strength of the other she had had, and she seemed perfectly to understand its properties and action. She also purchased a quantity of sal volatile and eau de Cologne. She then went, away, and nothing more took place. I had only supplied the deceased with one bottle of chloral hydrate previous to Monday last. On that day she told me she could not get any sleep without it, as she suffered from neuralgia. The deceased had asked for quinine for neuralgia, and I served her with that drug also in a bottle. That drug she also had in a concentrated state for convenience in taking it. The bottle which contained the chloral hydrate is a four-ounce bottle, is properly labelled, and would contain about thirty-two doses. The bottle is now nearly half empty, and I should think that about twelve doses are gone from it.—(By the jury): I have seen a quantity of chloral hydrate equal to four teaspoonsful of the strength contained in the bottle produced, taken without ill effect. If sal volatile were to be taken at the same time as chloral hydrate, it would increase the action of the latter. The contents of the chloral hydrate bottle are poisonous if taken in an unreasonable quantity, but it is not a legal poison, and druggists are not obliged to label it "poison." There are poisons which are obliged to be registered, and others which are only labelled. Chloral hydrate is not a poison that has to be labelled as such.—(By the coroner): The bottle now shown to me is the one in which I supplied the sal volatile to the deceased on Monday. It is now empty.

Mr. C. Bowmar, surgeon, said that he had been sent for to Mr. Turner's. He found the deceased had been dead for some hours. There had been no sickness or purging, indicative of any irritant poison having been taken. The four-ounce bottle produced, which contained chloral hydrate, was lying by her side, and nearly half empty. He saw that the bottle was properly labelled, and where it was from. There was a sufficient quantity gone from the bottle to cause death. His opinion was that death arose from taking an overdose of chloral hydrate. There was no appearance of struggling. He had been deceased's medical attendant for some time. She had frequently said, "You must give me something to sleep me." He had heard her complain of pains in the face and head, but not often. He had prescribed chloral for her several times. He was not aware that she knew anything about the properties of chloral hydrate, but she was a great reader, and probably she did. He did not think it probable that deceased had intended to commit suicide, but that she had drunk the chloral hydrate out of the bottle without measuring it.

A verdict to this effect was returned by the jury.

Accidental Poisoning.

On Saturday evening, November 18th, Mr. Richards held an inquest at Mile End Old Town, upon the body of James Robert Ludlow, aged three weeks, the son of Mary Ludlow, of Mile End. The deceased was troubled by a cough, and the mother sought the advice of her landlady, who gave her a bottle of cough mixture which had been prepared for the son of the latter, aged five. Half a teaspoonful was administered to the deceased, but the mixture was too powerful, and killed the child.

Dr. Corner proved that death was the result of exhaustion, consequent upon an overdose of paregoric and syrup of squills.

In summing up, the coroner drew pointed attention to the fact that many people ran away with the idea that because a child two or three years old could take a spoonful of a certain mixture without danger, a younger child could safely have a smaller quantity, but the case in question showed how utterly fallacious such an idea was. Verdict, "Death by Misadventure."

Obituary.

MR. JOHN BALMER.

We record with unfeigned regret the decease of this most amiable of Pharmacists who expired at St. Leonards in his seventy-second year.

He had long been in a precarious state of health and therefore the unwelcome event created no surprise amongst his friends. It is often said, *de mortuis nil nisi bonum*, but it is no mere compliment to state that few have surpassed Mr. Balmer in winning gentlenss of manner: not many have so studied the happiness of those around them. He possessed moreover that excellent gift too little cultivated in our day, a cheerful disposition.

He was apprenticed in Chester, we believe with Mr. Bowers. There happened to be in that ancient city another apprentice, the late William Ince, whose son writes these lines. Time passed and both eventually found themselves at Godfrey's establishment in Southampton Street in the Strand. This will explain why their intimate friendship should have been commenced, interrupted as it was but for a short period by the grave.

After a certain interval, Mr. Balmer established himself in St. John's Street Road, close by the Angel, with which locality his name has been so long connected. His old friend from Chester lived then close by, being separated only by a celebrated theatre which probably neither ever entered. Pleasant memories crowd upon the mind as we recall the frequent social gatherings in "Merry Islington," when youth listened while wise men talked, and when the two families were one.

In business Mr. Balmer was successful more particularly as he enjoyed not only the confidence but the private esteem of several eminent medical men amongst whom may be mentioned Dr. Dobell, Dr. Sansom and the late Dr. Golding Bird.

He was fond of experimental Pharmacy, and the occupation of what might be perhaps called his leisure was devoted to the investigation of new and supposed better methods of exhibiting Pharmaceutical preparations.

He was one of the first, if not the original maker of the Pancreatic Emulsion the therapeutical value of which is inseparably connected with the name of Dr. Dobell already mentioned. He was interested in the introduction of the Sulpho-Carbolates, and was a careful manipulator of Essences and Liquors. Indeed he was constantly at work on this class of remedial agents. One of the latest and most useful of his improved preparations was a Belladonna Plaster made by the use of resinous extract of Belladonna *root*, in preference to that made with the spirituous extract of the leaf. This plaster was recommended as requiring no adhesive margin and being cleanly in its use.

He made formerly an admirable Extract: Ignatiæ Amaræ, and in short, this department of retail laboratory work was his delight.

Of his dress and personal appearance it would seem rude to speak, but both were characteristic. He considered untidiness a sin.

His unaffected piety can barely be alluded to though it was the golden thread which bound all the actions of his life together. Now he has entered into rest, in sure and certain hope of the Resurrection to eternal life.—J. I.

MR. GEORGE WHIPPLE.

We regret having to record the death, on October 31st, of Mr. Whipple, one of the early and frequent contributors to the proceedings of the Pharmaceutical Society. For many years Mr. Whipple was engaged in the manufacturing department of the well-known house of Barron, Harvey and Co., of Giltspur Street, in which establishment, having the sole management of the laboratory, he had acquired a large amount of practical knowledge relating to the preparation of medicines. Those who were accustomed to attend the evening meetings of our Society during the first twenty years of its existence, will hardly require to be reminded of the numerous occasions on which valuable information was communicated by a gentleman who was rarely absent from those meetings, and was always ready in his peculiar and impulsive way to add to the common stock the results of his long and varied experiences. Nor was it in this way only that Mr. Whipple contributed to the advancement of the profession to which he belonged, for to those engaged in scientific inquiries his note-book was always open, as the works of Pereira and others can testify.

Advancing years and declining health caused Mr. Whipple to retire from his appointment in Giltspur Street in 1858, and since that time he has rarely appeared among the pharmaceutical friends with whom he had previously associated, and by whom he will long be remembered as an active, zealous and liberal-minded promoter of the scientific objects of the Pharmaceutical Society.

Among the papers that Mr. Whipple read at the Evening Meetings of the Society and contributed to this Journal may be mentioned those on "Essential Oil of Bitter Almond obtained from Almond-Cake," "Extract of Colocynth," "Purification of Essential Oil of Bitter Almonds," "Sulphate of Soda contained in Quassia Wood," "Remarks on the Preparations of the Pharmacopœia," etc.

MEETINGS FOR THE ENSUING WEEK.

Monday Nov. 27.	*Medical Society*, at 9 P.M. *London Institution*, at 4 P.M.—"Smell, Taste and Touch." By Professor Huxley. (Educational Course.)
Wednesday Nov. 29.	*Society of Arts*, at 8 P.M.—"Tramways and their Structures, Vehicles, Haulages and Uses." By Mr. W. Bridges Adams. *Geological Society*, at 8 P.M.
Thursday Nov. 30.	*London Institution*, at 7.30 P.M.—"Science and Commerce, illustrated by the Raw Materials of our Manufactures." By Mr. P. L. Simmonds. *Royal Society*, at 4 P.M.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

The Improved Tincture Press.

Sir,—My attention has been called to several letters which have appeared in your valuable Journal relative to the tincture press.

Mr. Staples appears to have been the first in the field recommending his double screw press in preference to the ordinary single screw, because such screws are subjected to a longitudinal tensile strain, instead of a perpendicular thrust or crushing strain, this latter having a tendency to bend the screw, or force it out of the perpendicular.

This is quite correct, providing the screw is too small to bear the strain, but it is not likely the press maker would fall into this error, for presuming that the bending or distorting of the screw was a general complaint, some one would have surely long since made a press with two screws instead of one.

Mr. Staples' press is of so primitive a character, that it appears to me to be such an one as would probably have been made 100 years since, before engineering skill had constructed machinery for cutting screws.

It must not, however, be despised for its primitive character, for there is one thing in its favour, it is simple, and can be made at a small cost. But as the ordinary screw press can be bought of any druggists' sundriesman for ten shillings and upwards, I do not think that the double screw press could be made for much less.

But then Mr. Staples says his press is so much more powerful than the ordinary variety, upon which Mr. Umney commented, basing his calculation on the pitch and diameter of the screws. This again is quite true, for one can make the screws of any power, provided the whole fabric is sufficiently strong to resist the pressure; and here it is that Mr. Staples is so greatly in error.

Mr. Staples estimates the power of his press at 20 tons, with screws of $\frac{1}{8}$ inch pitch, and $\frac{1}{2}$ inch diameter, or 10 tons resistance to each screw; and in his letter of the 21st Oct., he thanks Mr. Umney for inducing him to investigate his press more closely, and is so astounded at its enormous power that he says he feels some diffidence in stating that his estimation is now 30 tons.

I am really astounded myself, and should like to know where the iron was made to withstand such a strain.

Mr. Staples has quite ignored the all-important point in his calculations, viz. *the cohesive power of the iron*, of which the screws are made.

The argument now wholly turns upon this, and resolves itself into the following question:—What is the ultimate resistance of the iron composing the screws?

In answering this question, I will give Mr. Staples the benefit of the whole diameter, viz. $\frac{1}{2}$ in.

The ultimate strength of a 1-inch round bar of English iron is 43,881 lbs., which, divided by 4, is 10,970 lbs. as the ultimate strength of a bar of $\frac{1}{2}$-inch diameter; but as the press has two screws, 10970×2 must be the ultimate strength of both screws, or 21,940 lbs. (9·3 tons) as the breaking-strain.

Now with engineers it is customary, in order to ensure safety, to take the working strain at *one-third the cohesive power of the iron;* this would reduce the power of the press of Mr. Staples' design to 3 tons 3 cwt. ($9·3 \div 3·1$ tons). How then is it possible for Mr. Staples to give 30, or even 20 tons, as the power obtained by his press?

Mr. Staples, however, not content with 20 or 30 tons, even soars to 50 tons, which astounding and magnificent power is (he says) to be obtained and resisted by two highly-finished steel screws, with threads of $\frac{1}{12}$ of an inch.

Now I will give him *shear* steel, which has about double the strength of iron, then $9·3 \times 2$ or 18·6 tons would be the ultimate strength or breaking-strain.

Surely, therefore, it is perfectly absurd to talk about 20, 30 or 50 tons?

Then again, Mr. Staples has said nothing about the dimensions of the wooden base, or his cross bar.

I see in a very sensible letter in your last issue by Mr. B. Groves (who, although not a practical mechanic, has his head screwed on in the right direction), that he is the first to make allusion to them.

I should like here to caution Mr. Groves when trying his experiment with his wind-bag, that the highly compressed air does not suddenly burst its casement, and send the pieces flying at him. It would be far better if he wishes to try his experiment, to get a solid lump of india-rubber interposed between the marc and the screw; he may rely upon it, however, that the spring, if tried, will be of no manner of use, nothing can be gained by it, for it only forms part and parcel of the cross bar.

Mr. Groves observes that the intensity of the pressure exerted is always proportionate to the area over which it is spread, so that the pressure per square inch on the material can be made more or less by decreasing or increasing the surface of action. This very sensible remark, which he says is often lost sight of, has surely escaped Mr. Staples, for he does not even mention the diameter of his cylinder.

I would certainly advise Mr. Staples to give up the contest, for what good has it done? save that it has brought about a contention of who is right in estimating the power of a screw press, and whether the power applied should be taken at 50 or 100 lbs.

Now the fact is, one can estimate the power at anything *within the limits of the strength of the materials* of which the press is composed.

Anything beyond this is but a *reductio ad absurdum*.

"An Old Engineer."

Sir,—Mr. Groves essayed to determine, experimentally, the power which a man of average strength can exert in turning the lever of an ordinary screw-press, by applying, as the resistance to be overcome, a force acting vertically at the extremity of the lever,—the influence of the iron pulley employed being merely to change the direction of the force, and, by friction, to diminish it slightly.

If the rope had been attached to the head of the screw, Mr. Groves would have succeeded in solving the problem of the actual pressure exerted by the tincture press, since the resistance of the marc is a force acting vertically upwards; but that as a measure of the manual strength exerted in pressing, his result involves a huge fallacy.

Of course, a resistance applied to one extremity of the lever, could only be counterbalanced by a force equal to it, applied to the other, since the fulcrum is central; but when a weight is raised from the ground by the downward united progress of the lever and screw, the mechanical advantage of the latter contributes to the result.

Thus, assuming that the circumference of the screw in Mr. Groves' press was six inches, and the distance between the threads half an inch, and disregarding friction, the actual manual strength required to lift from the ground a weight of 216 lb., would be $216 \div 12 = 18$ lb.

This may appear ridiculously below the truth, but it should be borne in mind that the press was situated in a recess, and the operators may have been thereby cramped for room, also that the friction may have been considerable.

It has occurred to me that the compressor recently described in the *Times* as being employed to ascertain the expansive force of the charges of powder used for our heavy guns, might be adapted to show the actual pressure which the press-cylinder and its contents are called upon to resist.

Dover, Nov. 21st, 1871. J. Frederick Brown.

[*** Our correspondent appears to have misunderstood the arrangement adopted by Mr. Groves, inasmuch as he supposes the resistance overcome in the experiment to have been a force acting vertically at the extremity of the lever. We assume, however, that in Mr. Groves' experiment the resistance acted horizontally.—Ed. Pharm. Journ.]

Difficulties in Dispensing.

Sir,—The recommendation to which T. B. takes exception was challenged at the meeting before which my paper was read, although not mentioned in the report of the discussion that followed, but I really cannot see that the practice is so objectionable as he would make it appear.

I acknowledge that it is our duty as dispensers of medicine to carry out the intentions of the physician, and that we ought as far as possible to avoid "making material alteration in a prescription without the sanction or knowledge of the physician," but I contend that it is also our duty to present the medicine (if we can) in such a shape that the patient can take it without inconvenience.

Everybody knows that we often get prescriptions for pills which, if made strictly as prescribed, could not be formed into pills at all. This is one I had to make up to-day,—

Podoph. gr. xij
Scammon. gr. xij
Ext. Rhei gr. xlviij
Ol. Cinnam. gtt. xxiv
Ft. pil. xxiv.

which, if dispensed as written, would be about the consistence of treacle; and, in the cases objected to, I only stated what I considered the best method of doing that which practically every one does in private.

In most cases it would not be possible to communicate with the prescriber, and very few would thank us for doing so. I fancy a physician would be very much astonished to see me take one of his prescriptions, tell him the pills would be much too soft, and ask what I should do in the matter. I think he would tell me that I ought to know how to manage all that without bothering him, and I fear he would form a very low estimate of my qualifications as a dispensing chemist, and would tell his patients not to bring their prescriptions to me.

If T. B. will prove his assertion that, "in each of the cases named, no such difficulty exists as to render the change necessary," and will show us a "more excellent way," I for one shall be greatly obliged, as I do not consider myself too old to be taught. I should be glad, also, to know what he would have done with the following:—

R. Hyd. Chlor.,
Ext. Colch. Acet. ana gr. j
Ext. Rhei gr. ij
Ext. Coloc. Co. gr. v
Finge in pilulam. Sumat duas h. s.,

not being able to consult the prescriber.

Cheetham Hill, Nov. 20th, 1871. W. WILKINSON.

Sir,—It is with great pleasure that I read in the Journal of the 18th, the remarks of your correspondent T. B., upon Mr. Wilkinson's paper. I venture to take the liberty of supplementing them.

When I read Mr. Wilkinson's paper in the Journal of the 11th, I was astonished that so bad a practice as that urged by Mr. W., viz. the trifling seriously with a physician's prescription in order to render it easier of preparation, should have excited no surprise (if any expressions of indignation did take place, I presume place would have been found for them in the Journal). I can only explain it by the presumption that the Manchester chemists have but lax notions of the duties of their calling. It seems to me that the substitution of p. gent. for ext. gent., and of p. hyoscy. for ext. hyoscy., and the omission of half the essential oil ordered in a quantity of pills, are far too great liberties to be taken by any chemist. I also think the whole tendency of that part of the paper alluded to, would tend to lead apprentices and some assistants to think they are doing but right, even if they go a little further, and, for the sake of convenience, profit, or saving of time or trouble, omit or substitute by others, the ingredients of any prescription confided to them.

In conclusion, I would advise all dispensers rather to send out occasionally a somewhat badly manipulated medicine, than depart seriously from the use of the quantities ordered in a prescription, without the consent of the physician.

Leicester, Nov. 20th, 1871. WALTER B. CLARK.

PHARMACEUTICAL EDUCATION.

Sir,—At the present time when so much surprise is expressed at the number of those plucked for both the Minor and the Preliminary, I think less would be felt if the circumstances in which many apprentices are placed were more fully known.

A man calling himself a chemist and druggist, often more of a quack-doctor, takes a youth as an apprentice, with little or no Latin and barely sufficient English even for the Preliminary. For four years, perhaps five, he struggles on, working his twelve hours per day, and learning what? chiefly how to serve a pennyworth of hair-oil or a box of capsules. As to prescriptions, he scarcely ever sees one, and when he does, what sort of dispensing is he to learn from using tinctures, half-and-half, with perhaps the additional peculiarity of having their expensive adjuncts left out?

And when he comes out of his time he finds that he has been deceived,—robbed of four of the most valuable years of his life; has to begin the world anew, nay, more, to eradicate those notions derived during his apprenticeship. It is a monstrous crime for a man to sign to teach a boy the "art and mystery of a chemist and druggist," and, at the same time, know that he is incapable of doing so. But there are many such cases spread over the country, and are not at least some of the failures traceable to them? It has been stated, and upon good authority, that the better class of pharmacists decline taking apprentices. If so, are we to understand that if not on the increase, this unfortunate class is still kept up?

November 20th, 1871. METEOR.

Sir,—On the subject of professional education, allow me to make a few remarks.

Under the new *régime*, before a young man can commence business as a chemist, he is compelled to undergo a somewhat difficult examination, therefore study during the term of his apprenticeship is absolutely necessary, and a certain time should be allowed him for that purpose. But in most cases apprentices are obliged to work from 7.30 A.M. until 9 or 10 P.M., during which time no opportunity is afforded them (except at those periods, say two or three times a week, when grace is given them for necessary relaxation and exercise). Under such circumstances it frequently occurs that candidates who go up for examination are plucked, not from a want of zeal and attention on their part, but mainly because the necessary preparation and proper time for study have been overlooked by the employers during their term of apprenticeship. Y. Z.

T. W.—Your communications are received and shall have attention.

"A Correspondent."—Britten's 'Dispenser's Vade Mecum' is sold by Messrs. Maw, Son and Thompson, price 3*s.* 6*d.*

S. C.—We think that you might obtain the work through the publishers of this Journal.

John Jinks.—Apply to the Registrar for a paper containing some "Hints to Apprentices and Students," in which you will find the information you require.

H. E. R.—Mohr and Redwood's 'Practical Pharmacy' is the only English work of the kind with which we are acquainted, but we believe it is out of print.

J. P. T.—The subjects may be taken in any order. If we may judge from the letter received, we would recommend our correspondent to pay particular attention to the study of English before he again presents himself for examination.

T. David.—Probably *Echium vulgare*, but the specimen is much injured.

"Taraxacum."—We think a machine similar in construction to the bark-mill used by tanners for reducing into shreds oak-bark would answer very well. Such a machine is already in use in some of the drug-grinding establishments in town, and is made to prepare cinchona-bark, calumba, gentian, etc., in a fit state for infusion, without making any dust.

"Ignoramus."—(1.) No. (2.) Yes. (3.) The Major and Minor examinations are held only in London and Edinburgh; the Preliminary examinations may be conducted under the superintendence of the Local Secretary of the district most convenient to the candidate.

"Amico."—The Minor examination is entirely *vivâ voce*, and is of only one day's duration. With regard to the Major examination, particulars should be sent to the Secretary, at 17, Bloomsbury Square.

R. Keevill.—Your letter has been handed to the Secretary. See a notice on p. 2 of the advertising sheet as to the occasional delay in the delivery of the Journal.

A. M.—The temperature may be raised to any point, provided that the water is under sufficient pressure.

Ph. C.—By section 1 of the Pharmacy Act it is made illegal for any person not registered under that Act to assume the title of "Druggist."

"Inquirer."—See a case reported in this Journal, 3rd ser. Vol. I. p. 775.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. A. Mitchell, Mr. J. Pyne, Mr. J. Yates, Mr. H. Pocklington, Mr. G. D. Wenham, Mr. J. R. Jackson, Mr. M. C. Cooke, Mr. W. Martindale, Mr. Sydney March, Mr. J. T. Wallis, P. C., W. P. D., Y. Z., "Spero," "Veritas," "Logwood."

G. J. T. has not complied with the rule in reference to anonymous communications.

THE ACTION OF NITRIC ACID UPON NATAL ALOES.

BY WILLIAM A. TILDEN, D.SC., F.C.S.

In the course of reading the interesting paper of Professor Flückiger upon the "Crystalline Principles in Aloes," presented at the last meeting of the British Pharmaceutical Conference, and recently published in the PHARMACEUTICAL JOURNAL, I was struck with one statement which appeared to me extraordinary. It was to the effect that his "nataloin," when treated with nitric acid, yielded nothing but oxalic acid, and that though sought for, picric and chrysammic acids were not to be found. I regard the aloins as bodies belonging to the class called phenols,—in fact, a kind of orcin, though unquestionably of a complex and highly condensed type. It therefore, seemed to me improbable that nataloin, whilst agreeing with other substances of the same family in general characteristics, should so far differ as not to give a nitrated acid of some kind. I therefore procured a small quantity of Natal aloes, and prepared from it the crystalline principle according to Flückiger's directions. His description of the physical characters of this substance appear to be correct. Three grams of perfectly pure nataloin, which had been several times crystallized from rectified spirit, were dissolved in about ten cubic centimetres of pretty strong nitric acid, and, when the first violent action was over, the now orange-coloured liquid was digested in a flask for two or three hours, it was then turned into a dish and evaporated to dryness. A mass remained, which was evidently chiefly oxalic acid, but was tinged intensely yellow; it was put back into the flask with a small quantity of fuming nitric acid (sp. gr. 1·45) and warmed gently till all action seemed to be at an end. The liquid was once more evaporated to dryness. On treating the residue with water it gave a solution of a bright golden colour, which dyed silk yellow. Warmed with cyanide of potassium, it gave a blood-red liquid, and, when boiled with chloride of lime chloropicrin, unmistakable from its frightful odour, was evolved. Shaken with lime and ferrous sulphate, a red liquid was produced. The remainder of the residue was mixed with solution of potassic acetate and allowed to stand; next morning tufts of orange needles were deposited. These were found to be explosible, and when boiled in water and mixed with ammoniacal cupric sulphate, the characteristic green precipitate changing, on boiling, into yellowish scales was produced. These reactions indicate, beyond doubt, the formation of *picric acid*, but as I had not enough material from this experiment to analyse one of the salts, I treated some of the crude drug with nitric acid. This requires some caution, as with nitric acid of sp. gr. 1·37 the action is very energetic, and a great deal of frothing occurs in the early part of the process with production of a large quantity of a ruby-red resinous substance. When this, however, is digested for some time with nitric acid, assisted, towards the end, with a little fuming nitric acid, an oily substance results, which solidifies, on cooling, into crystalline masses. These treated with boiling water dissolve, forming a bright yellow bitter solution, which, after neutralization with potassic carbonate, deposits, on cooling, a magnificent crystallization. These crystals are but slightly soluble in water, but may readily be crystallized from boiling water. Long lustrous prisms are then obtained, which present all the appearance and characters of potassic picrate. Analysed, ·5420 gram dried at 230° F. gave ·1735 of potassic sulphate, which corresponds to 14·33 per cent. of potassium. Picrate of potassium, $C_6H_2(NO_2)_3KO$, contains 14·60 per cent. of potassium.

The action of nitric acid upon nataloin yields, therefore, both oxalic and picric acids.

A CHAPTER IN MICROSCOPY.

BY HENRY POCKLINGTON.

The author of a certain book on the microscope tells a tale of a person who purchased a first-class microscope from one of the then principal manufacturers in London, but a few days after desired to return it, with the remark that he had tried it and found it perfectly useless, because it would not even show the crystals of sugar. In reply to an interrogation as to how much he had tried to look at, he said, "Oh, a good big lump from the sugar basin!" However much an experienced microscopist may be disposed to laugh at such crass ignorance of the proper way of using the microscope, the purchaser was to be pitied if he had become the possessor of a costly instrument without having the least notion as to how the thing was to be used, or for what purpose its several parts were designed. And there is no doubt, that amongst the many possessors of an instrument which now bids fair to be as fashionable a piece of furniture in a well-to-do household as a pianoforte, there are many whose ideas of how to use it are in a state not so unlike that of our lump-sugar friend, and who may not be indisposed to be thankful for a few hints as to what to do and what not to do.

The initial difficulties in the use of the microscope are not very great; a few minutes, or, at any rate, hours, will suffice to overcome them. In the higher walks of microscopy the case, as we shall see later on, is somewhat different. But as the tyro must walk before he can climb, he need not trouble himself by looking so far ahead.

We will assume that the microscope has been purchased:* not a big showy stand unfit for rough every-day work, but such a student's as any maker will sell nowadays for £5, £10 or £20, according to the apparatus required therewith: and has been brought home, unpacked, and the happy purchaser only too anxious to delight the eyes of his wife with the wonderful "revelations of the microscope." He will probably have learned the names of its several parts, and how "to put them together." At all events, he ought to get this much information from the maker of the instrument, and to be prepared to listen to us with his microscope *en règle*.

The first question to consider is that of the light to be used. Books are agreed as to this. Daylight being, according to them, by far preferable to any artificial light; yet, by far, the majority of microscopists use artificial light for their researches,—partly from compulsion, because their day-time is occupied by other pursuits, called by a microscopical friend butter-bread business, but also because a

* Big microscopes are not to be despised by those who can afford them, and who range the higher fields of research. Our remarks apply only to beginners.

movable lamp is under more perfect control than daylight can well be, and is also in this England of smoke and cloud more to be relied upon for constancy. Whichever be used, the light should fall upon the instrument from the left-hand side, if the observer use his right eye chiefly (as most do); and from that side in any case, if there be many adjustments to be made of the illuminative apparatus, which, being made with the right hand, would cause a disagreeable shadow were the light allowed to come from that side. By daylight care should be taken that the direct rays of the sun are not allowed to fall upon the object. Light from a white cloud opposite to the sun, or nearly so, is best; that from a *blue* sky is wholly unfitted for micro-polariscope work, as it is chiefly composed of light already polarized in one plane, and, therefore, only transmissible through one direction of the polarizer.

Lamps.—Their name is legion. We cannot advertise them all. Personally, we prefer an ordinary paraffin lamp, which need not cost more than a couple of shillings, or, including Mr. Swift's Blankley's new chimney, about five shillings. Such a lamp embodies nearly all the advantages of the most elaborate, and is not an addition to the paraphernalia which so often disturbs the mind of one's better half when his microscopical laboratory happens also to be his or her sitting-room. The addition to the lamp of a piece of glass stained to a decided neutral blue tint is very pleasing, and gives great relief to the eye, as most of the yellow rays that are so disagreeable and wearying are stopped back. But if such be used, it is needful to use a larger flame than would be otherwise needful. Gas is, in our notion, simply hateful for microscopic purposes, on account of its great unsteadiness, heat and its products of combustion.

Seated then at the table, not too high as to necessitate the craning of the neck, nor so low as to cause an ugly stoop (upon all these *little* things success in microscopy is dependent to a greater extent than is commonly recognized by even experienced microscopists), with the light of his lamp well adjusted, to avoid either smoke or glare, and the lamp a little to his left, the tyro may begin to work.

He cannot do better than familiarize himself with the varied effects produced upon some homely object, such as a section of wood, by direct and oblique light falling at different angles. In other words, he should begin by learning the use of the mirror, used with those objects which are sufficiently transparent to allow light to pass through them, and the bull's-eye condensing lens, used to throw light upon those objects that are too thick or otherwise too opaque to be viewed as "transparents." One of the earliest lessons we hope he will learn will be that too much light renders it difficult or impossible to see the details of an object, especially if low powers be used. From this he will learn to alter the focal adjustment of the mirror or condenser, by moving it nearer to or further from the object under view, and also that the intelligent use of the several apertures in the diaphragm plate will greatly aid him in his efforts to obtain just so much light, and no more, than is necessary. Collins' iris diaphragm, if he be so happy as to possess it, will place literally, as well as figuratively, at his finger-ends, through a few turns of a milled head, the means of doing this to the greatest possible nicety. Having become thus far conversant with the "go" of the microscope, our friend may safely begin to think of entering upon that particular department of microscopic work into which choice, or the fates, may happen to call him. That is to say, having become master, to some extent, of the instrument, he may proceed to learn how to prepare objects and fit them for observation. Here, however, we cannot at this moment attempt to help him, as we want to say a few words to him and to more advanced microscopists respecting *their* part of microscopic work.

There is, perhaps, no branch of science in which what astronomers call "personal errors" more abound, or where the poet's aphorism, "things are not what they seem," is more applicable. A few of these "errors of interpretation" may be briefly noticed.

1. *Foreign matter.*—The presence of foreign matter in the preparations of young, and especially careless microscopists, is the source of great perplexity, and the fruitful cause of wrong conclusions. Perhaps the most frequent of these are air bubbles. All beginners in microscopy are perplexed with these; the more so as they are often the most prominent features in even good slides by very experienced men. Usually a very little experience will enable the observer to decide as to the nature of the queer-looking black rings with bright centres that he sees in the field; but there are cases where,—the bubbles being exceedingly minute and confined within a delicate tissue, which alters their shape, and consequently their refractive power,—it becomes somewhat difficult to decide upon their nature. It is, under these circumstances, a matter of great care and skill to decide whether the appearance is due to the presence of air, of oil, or, in some cases, of water. The question, if solved at all, will be solved by careful observation of the effect produced by *alteration of focus.* The milled head of the slow movement must be turned very slowly until the objective is *raised* out of focus, and then reversed until it has been *depressed* out of focus. Oil globules become *lighter*, as the objective is *raised*, and darker as it is depressed, whilst water globules and air-bubbles, surrounded by oil or balsam, do exactly the reverse. The explanation is, of course, to be found in the very different refractive powers of the three substances. In the case of the oil globule in water, the globule acts as a *convex* lense of short focus, the other globules acting as concave lenses. In the examination of vegetable and pathological preparations, it is often of essential importance that the observer should be able to detect the difference between a vacuole, an air-bubble, fat or resin globule; and no pains spent in becoming familiar with their several appearances will be regretted. Particles of "dust" are also the source of frequent error, and we would strongly urge the student to acquaint himself with the microscopical appearance of such substances as compose the ordinary "dust and flue" of his rooms. The nature of this pest to housewives varies so much in different localities that we cannot particularize *all* its ingredients. The following are the most perplexing:—butterfly scales, starch granules, portions of wood fibres, hairs, cotton and wool fibres, leaves, fungi spores, and, by no means least, excessively minute particles of soot and other mineral matter. Nothing but experience will serve the student here, and fortunately it is easily and inexpensively gained.

(*To be continued.*)

COD-LIVER OIL, ITS MANUFACTURE AND COMMERCE.

BY P. L. SIMMONDS.

The trade in cod-liver oil has become an important and thriving one, and is evidently increasing with the advance in prices of late years. Our average imports, taking the last three years as a criterion, are about 890 tuns,—the following figures giving the official imports and computed real value. The returns for 1870 and 1871 are not yet published.

1867 . .	818 tuns,	worth	£52,163.
1868 . .	843 ,,	,,	56,878.
1869 . .	1011 ,,	,,	75,081.

The bulk of the oil received is pretty evenly divided between the two great seats of the cod fishery, Norway and Newfoundland, although the former is now taking the precedence in production.

The following are the relative proportions and prices:—

Imports from Norway.

		£.	s.	d.
1867 . .	322 tuns, price	63	1	0
1868 . .	399 ,, ,,	68	5	0
1869 . .	399 ,, ,,	75	11	0

Imports from British America.

		£.	s.	d.
1867 . .	227 tons, price	63	16	0
1868 . .	233 ,, ,,	68	0	0
1869 . .	327 ,, ,,	74	8	0

It is strange that our merchants and fishermen at Newfoundland have allowed the Norwegians to trench so largely on this manufacture, for there has been no increase in the export from Newfoundland, which stood at 327 tuns of refined cod-liver oil in 1857.

From the above figures we see that the medical employment of cod-liver oil has attained to grand proportions with ourselves, whilst its use has also become very general in Europe, America and our colonies.

The livers intended for preparing the medicinal oil are first washed and dried, and then, after a careful examination, to see that there is no gall left in them, they are placed in tinned iron pots. These are again placed in larger pots, and steam being circulated between them from a furnace, the liquefaction gradually proceeds. Some makers substitute hot water for steam, alleging that it is easier to regulate the temperature; others allow the steam to enter the pots which contain the livers. As the melting proceeds, the oil is removed by larger ladles and left to cool. It is filtered once or twice and poured into barrels, when it is ready for shipment. The parts which do not readily liquefy, or which remain after filtration, are left in the pots and further heated, until they acquire a deep brown or olive colour. The brown oil thus extracted is employed by curriers, and the residue or deposit forms a useful fertilizer for land. The fishermen who prepare the livers on their own account merely place them in casks or vats, and let them dissolve naturally, collecting the oil which drips. The first oil thus obtained is the clearest, and of a pale straw colour. It is to this the name of "superior white" is given. If the flavour is good, it is employed for medicine. In some countries it is even preferred to the medicinal oils obtained by steam. The second collection yields "ordinary white" oil of the colour of Madeira wine, and the third a clear brown oil. It is this quality which is sold under the signature of Dr. de Jongh, of the Hague. The residue or deposit is heated, as in the steam factories, to obtain the common brown oil for curriers, so largely used in the leather manufactories of Holland and the North of Germany.

The best kinds of steam-prepared oil are shipped in tinned cases, and occasionally in oak barrels, as the ordinary kinds of oil are. But in Finmark, if the fishing is abundant, they are obliged to ship in fir casks.* The export of all kinds of fish oil from Norway, which usually averages 7,000,000 or 8,000,000 litres, was in 1866 nearly 10,500,000 litres.

One method of making cod-liver oil is thus described in the report of the Select Committee on the working of the Fishery Act of Canada:—The apparatus is simple and inexpensive, consisting of a box made of common boards, which may be lined with tin, as being more easy to wash; a cloth is laid inside the box and upon this the livers are placed; the box is provided with a closely-fitted solid cover. A pot, holding forty or fifty gallons, with a tight-fitting wooden lid, is placed some feet from this box, and a wooden pipe or tube leads obliquely from the lid, and communicates with the box in which the livers are. Twenty-five or thirty gallons of water are put into the pot, and the steam entering the box, eliminates the oil and water resulting from the contents. A barrel is placed beneath the centre of the box, in which a hole is pierced to permit the oil to escape. After the steam has been allowed to remain in the box for two or three hours the cover is removed, the livers stirred up, and a little salt thrown in to precipitate the strong parts of the liver. The contents are allowed to settle for five minutes, after which the oil which comes to the surface is removed. The box is then closed again, and the process repeated every hour. This must be carefully carried out, in order to obtain white and sweet oil of the best quality. When it is apparent that no more oil remains in the livers, they are exposed to the sun, and become fit to be used in making soap. By this method, from the same amount of livers, more than double the quantity of oil is obtained than from the former crude processes; from a cask containing thirty gallons can be extracted fifteen to seventeen gallons of oil of the best quality.

At St. Pierre and Miquelon, where the French share in the Newfoundland cod-fishery, a considerable trade is carried on, not only in the common cod-oil of commerce, but in refined cod-liver oil. The former is simply obtained by the fermentation of the livers in casks placed in the holds of the fishing-vessels, or on shore near the dwellings. About 500,000 kilogrammes a year are shipped of it.

The preparation of brown and white medicinal oil at St. Pierre is becoming an object of much importance, and has been encouraged by the Paris Academy of Medicine, who state that the brown, pale and white oils of the French fisheries of Newfoundland equal the best products of the Norwegian and

* 'Les Pêches de la Norwége,' par Herman Baars.

English manufacturers. That which is made in the months of April, May and June is considered by the French the best, as the livers are then lean, later they become too fat, and yield a less useful oil in a therapeutic point of view.

On the Norwegian coast the catch of each boat varies in the yield from eight to twenty barrels of livers. The fish in the early part of the season are rich in liver, so that from 250 to 300 of the net-caught fish give a barrel of liver, while 50 to 100 more of the fish taken on lines are required. As the season advances, the fish become perceptibly poorer, from 400 to 450 being required to fill a barrel; while on the seaboard or western side of the Lofoden Islands from 600 to 700 are necessary. On the whole, therefore, it may be assumed that the average number of 450 livers is required to fill a barrel. The total produce of cod-liver oil from the Norwegian fisheries in 1869 was estimated at 19,000 barrels, and good marketable roes 17,000 barrels. 200 barrels were prepared as medicinal cod-liver oil. Fresh livers for medicinal oil fetched from 27*s.* to 31*s.* per barrel, old livers from 22*s.* to 26*s.*, and cod roes from 32*s.* to 35*s.* per barrel.

A long and interesting article on the manufacture of cod-liver oil in Norway, by Mr. Peter Möller, a chemist of Christiania, was published in my *Technologist* for 1862 (vol. ii. p. 376), from which I extract the method he recommended to be pursued:—

"The liver is taken as fresh as possible—that is, as soon as it is taken out of the fish,—and is then washed and cleaned with water, and the gall-bladders removed; it is then cut up into small pieces, and thrown into the kettle. When this is nearly two-thirds full, the fire is lighted underneath, and the water in the kettle is brought to a boiling state, and must be kept so as long as the process of melting lasts. The whole mass must be constantly stirred, and pressed with a large wooden spoon, in order to promote the separation of the oil, which as it liquefies is gradually poured into a cask through a strainer.

"The process must be continued in this manner till all the oil is extracted from the livers. The remaining portion of the liver is then taken out of the kettle and laid on one side, in order to yield the brown or currier's oil, after the manufacture of the best and purest oil is completed."

In good years from 12,000 to 16,000 casks of both sorts of oil are exported from Norway a large portion of which is employed for medicinal purposes.

(*To be continued.*)

PHARMACY IN EDINBURGH IN THE OLDEN TIME.*

BY JAMES MACKENZIE.

Gentlemen,—The subject which I now intend bringing before you, viz. "Edinburgh Pharmacy in Olden Times," is one fraught with much interest to all who are engaged in the study and prosecution of this science, exhibiting as it does the rise and progress of pharmacy in our good old city during the last two or three centuries. The circumstances which seem to have conduced to its most primitive existence, are more complicated, obscure and curious than one could well imagine at first sight. A knowledge of medicines and the mysteries which have ever shrouded their preparation, dates from the earliest time. To relieve disease by the use of such means is associated with Christianity itself; hence, for long ages, we find it connected with various ecclesiastical bodies, being then considered an inseparable part of their education and calling. While there was much to recommend its being thus associated, we have good reason to believe it was often used for sinister purposes.

At the very outset, however, we are reminded that pharmacy had for long ages been associated with the "healing art," and the difficulty is to ascertain the exact date when it had a separate existence. On that account we are obliged to consider our subject in its collective capacity, and try to follow it throughout the many changes which records of its history call to mind.

From what we are able to gather, there has ever been a desire amongst the learned and unlearned to try the practice of this science. Here we must notice the fact that wherever ecclesiastical edifices of any importance existed, there the monks and members of the clergy were found pursuing the alchemical art, for the primary purpose of discovering that eagerly-sought-for prize, "the philosopher's stone," which was to transmute all base metals into gold. That, of course, was a fruitless search, but it resulted in the discovery of much that was unknown in chemical science, so that these men, though in pursuit of so absurd an object, were unintentionally laying the foundations of pharmacy, and are the reputed discoverers of some of those chemical preparations which hold no unimportant place in our day,—I refer to such substances as calomel, antimony, etc.

We have, on the other hand, the herbalists,—he or she, as the case might be,—who practised the "healing art" by the application of all manner of vegetable substances. Here, also, mystery was carried to a great extent. The place where such herbs grew, and the particular ray of the sun or moon which must shine on them during the process of gathering, were all matters of the greatest importance; indeed, it was imagined that inattention to such particulars would retard or destroy all the virtue these herbs were thought to possess.

During the fifteenth century, however, a great change passed over Scotland and her capital. There was a reformation in ecclesiastical matters, which extended to many other departments, and, amongst these, pharmacy had its share. A new generation of men sprung up, who appear to have held a position between the former extremes, and who practised surgery in its ruder forms. To this, pharmacy was added as a necessary part; but, not content with that, they were incorporated with the barbers,—to us a strange and laughable combination. Here we may notice that even to the present day, some barbers exhibit a pole and plate above their door, the recognized sign in olden times that bleeding and bandaging were done by them. In our Council Register we are informed that, "On the 5th day of July, 1505, the surgeons being the first company of craft in Edinburgh, they, according to the custom of other European nations, were incorporated with the barbers, by charter." This record or charter contains a full and particular account of their several duties and requirements. In one clause we find the following:—"That na person, man or women, within this burgh, mak or sell ony *aqua vitia* within the samyn, exceptis the said Maisters, Brithers and Freeman of the said craftis, under the payne of escheit of the samyn, but favour." Thus we see whisky was, in 1505, recognized as a pharmaceutical preparation, only to be made and sold by the surgeons. How strangely does the wisdom of our forefathers, in this respect, contrast with the foolishness of their sons! The above charter was confirmed by James IV., on the 13th of October, 1506, and Queen Mary, in consideration of the close and necessary attendance of the members of the Corporation on their patients and studies, did, by her letters patent of the 11th of May, 1567, exempt them from attending juries, watching and warding within the city and liberties of Edinburgh. These grants were confirmed by James VI., on the 6th of June, 1613, as they likewise

* Read at a meeting of the North British Branch of the Pharmaceutical Society, Edinburgh, November 24th, 1871.

were by Parliament on the 17th of November, 1641. Upon application to the Common Council of Edinburgh, they, by their Act of the 25th of February, 1657, erected the surgeons and apothecaries into one community, which, with former privileges, were confirmed by Charles II. and ratified by Parliament on the 22nd of August, 1670, as they were some time after, by letters of William and Mary, of the 28th February, 1694, with an additional grant to practise within the counties of East, West and Mid-Lothians, the shires of Fife, Peebles, Selkirk, Roxburgh and Berwick, which was confirmed by Parliament on 17th July, 1695.

The arts of surgery and pharmacy being thus united, the Corporation laid aside the barber craft, which occasioned the Common Council, by their Act of the 26th July, 1682, to recommend to the Company to take care to supply the town with a sufficient number of persons qualified to shave and cut hair, on such terms as they could best agree on, and that the said persons should be held as dependants on the surgeons, which was accordingly performed, and so continued till the 23rd February, 1722, when the Court of Session, by their decree of this date, separated the barbers from the surgeons in all respects, other than the barbers are obliged to register the apprentices with the surgeons, and to be admitted by them and the barbers. Now the barbers being forbidden to practise surgery, the Common Council in lieu thereof, allowed them to make a spirituous liquor, called aqua vitæ.

In 1621, we find the first mention of apothecaries in Edinburgh, in connection with an order by King James VI. to the Parliament, for a College of Physicians there. Here, then, we find the nearest approach to pharmacy, as a distinct branch, which the well-meaning physicians intended to look after, by proposing to have three of their number set aside for this purpose. Fortunately, however, for the apothecary, this order never became law, though repeated attempts were made by them to gain their purpose. It is evident by this time, that a distinct body of men had begun to practise pharmacy, apart from the surgeons, barbers and physicians, yet practising some of the minor operations in surgery, under the designation of apothecaries. This appears to have been the result of circumstances, more than anything else; at the same time the physicians and surgeons rose in their own and the public estimation, just in proportion as pharmacy was left to the apothecaries. Yet the physicians felt this new arrangement most galling, and were loth to see the apothecary acting independently. We see the progressive development of pharmacy, in the draft of certain particulars which the physicians wanted, when in 1630 they applied to King Charles I., in a renewed attempt to obtain a charter for a college. Here first mention of druggists—or drogists, as they were then called—is made. Then, in 1656, the physicians once more renewed their application to Cromwell; and in the memorial drawn out for this purpose, the druggists are again referred to, and on this occasion they seem to have risen somewhat in the social scale, because they are named before the apothecaries. Whether this was caused by their superiority, or greater troublesomeness to the physician, is not known. It is evident, however, that jealousy was very strong amongst all grades connected with the "healing art." When we look back to the list, which includes the monk, herbalist, surgeon, surgeon-barber, apothecary, physician and druggist, we, as pharmaceutists of the present day, may form some idea of our origin, and the associations connected with pharmacy in Edinburgh.

I will now read some extracts from the Council Register, which will convey to you some notion of the exactions attempted to be enforced upon the pharmaceutists by their brethren in the higher grades of the Esculapian art, which were, however, no more successful than were similar attempts made in this direction during the present year.

The following is an order of King James VI., dated July, 1621:—

"Commissionaris, and Estates of Parliament, we greit you heartilie well,

"For sae meikle, as we are certainlie informet, of the gryte abuse done and practised; be ane number of ignorant and unskilfull persons, quha without knowledge of the sciense and facultye of medicine, being nather learned nor graduat therein, presumes at their awen hand to profess and practice physick and medicine to the gryt and evident hazarde and danger of the lyffes and healthes of many of our subjects, quhilk evill is becume so ryff and frequent, that the samyne is lyklie to produce great harme and detriment, except the samyne be tymouslie prevented," etc. etc.

The order goes on to describe the nature of the constitution of the College, how its professors were to be elected, etc.; but the doctors could not venture, even at this date, to leave the poor druggists out in the cold, with no one to look after them, so they provided that warrant be given to the said College and Incorporation, "To make choice yierlie of three of their number, who sall have the cair and charge to searche and try the freshness and sufficiencie of all drogges, wares and medicaments, being within all and whatsumever apothecaries choppes, within our said burgh of Edinburgh, and gif they be found corrupt and insufficient, to destroy the samyne, and that ye sett down penalties against the refusers or contraveners of the said statute," etc.

"Given at our Manor of Otelandis, the third day of Julie, 1621."

The following is attached thereto:—

"This conteynes your Majesties warrant to the Commissionaries and Estates of Parliament, for the erecting of a colledge of physicians, and prohibiting wemen and ignorant persons practising that arte in Scotland.

"Signed, George Hay, 2nd August, 1681."

It has been truly said, history repeats itself. How strangely does the reading of the restrictions in the above sound in our ears, after what has so lately happened! Though 250 years have come and gone, yet the order of 1621 had much the same fate as the intended Bill of 1871.

The wise and gracious purposes of King James were therefore frustrated, and it is strange to notice the means which were used in those days to accomplish this. It was through the influence of the clergy. The bishops saw their prescriptive privileges were thereby affected, and suspected, whether justly or not, that the physicians, as to their religious or rather their ecclesiastical opinions, had too much sympathy with the popular party, who were not favourable to the episcopal rule. The corporation of surgeons were also alarmed for their own privileges, and very readily lent their co-operation to defeat the design of the physicians. In 1630, the physicians of Edinburgh again renewed their attempt to obtain a patent. Their application this time was to King Charles I., who referred the matter to the consideration of the Privy Council, who in turn ordered the physicians to give in some heads and articles for the erection of a college, which they did in 1633. From these articles it appears that, not daunted by their former want of success, they now demanded greater powers and more extended privileges, and proposed that the institution should have, not a local character and jurisdiction merely, but national. As in former days, however, opposition was raised from the old quarter, hence obstruction and delay resulted.

But, to give you some notion of what they proposed to do with the druggists and apothecaries, over and above looking after themselves and the surgeons, I will read a few extracts from some of the articles which they drew up:—

"Article 5th.—That power be granted to all the particular societies of medicine, of the foresaid incorporation, to appoint yearly, at what time it sall be thought by the said societie most expedient, two censors of their number having with them ane apothiquer of the towne of their residence, to view, try and examine the sufficiency of all medicaments, drogues, compositiones, waters, oiles and chymicall preparations, and to report to the said societies, to the end that whatsoever sall be found by them to be either adulterate or corrupt and carious, may be by them ordeaned to be destroyed and cassed, without any hinderance to be made for that effect be any apothiquer, drogist or sellers of insufficient droges.

"Article 6th.—That power be granted to the said colledge, with the concurrence of two apothiquers whom the said colledge sall please to nominate, to tax and appretiate yearly all drogs, medicaments and compositiones, waters, oiles, and all which be in use to be employed; and that it be ordered that publick records of the severall taxes and appretiationes be made, whereof ane copie sall remaine in the custodie of the said colledge, and every apothiquer sall have ane publickly extant in his buith, that the buyers may have knowledge and insight of the prices, and to fine the exceeders of the said taxes proportionallie to the quality thereof.

"Article 7th.—That prohibition and defense be made to all the apothiquers and droguists, and to all others within the kingdom, to sell any drogues of dangerous quality,—as antimony, opium, scammony, arsenic, mercury, sublimat, hellebore, elaterium, or any narcotic, cathartick, or purging medicaments,—to any whatsoever, except alternately either to the apothiquhers or to the physician of the forsaid incorporation, or licentiats from the said colledge, or to such others as has their warrant and ordinance for the same, with power to the said colledge to fine the delinquents."

Then it goes on to say that these articles are to be "oppenly proclaimed at the mercate crosses within this realme, and be printed by the king's majesties printer, to the effect that none pretend ignorance."

(*To be continued.*)

PRESENCE OF MILK-SUGAR IN A VEGETABLE JUICE.

BY G. BOUCHARDAT.*

By extracting sugar obtained from the juice of the sapodilla (*Achras sapota*) with boiling alcohol, a crystalline substance is obtained, which, after being twice recrystallized from water, possesses all the properties of milk-sugar. It is hard, crunches between the teeth, is slightly sweet, melts at 204°, and gives off gas if this temperature be maintained for some time; it is soluble at the ordinary temperature to the extent of about 14 parts to 100 parts of water, and its solution rotates polarized light to the same degree as milk-sugar; heated with potash it turns brown; it reduces potassio-tartrate of copper, but does not undergo alcoholic fermentation by contact with beer-yeast under ordinary circumstances; it is precipitated by ammoniacal acetate of lead, and when treated with five times its volume of dilute nitric acid produces a certain quantity of mucic acid.

The mother-liquor from which the above substance is obtained yields crystals possessing all the physical and chemical properties of cane-sugar.

The relative proportions of cane-sugar and milk-sugar in the substance employed are as 55 to 45.

The author also states that on treating the extract juice of ripe sapodilla fruit with acetate of lead, precipitating the saccharine matters with ammoniacal acetate of lead, and decomposing the precipitate with sulphuretted hydrogen, the filtered liquor concentrated to a syrup, purified by solution in alcohol, and subsequently treated with dilute nitric acid, readily yields crystals of mucic acid.

* Compt. Rend., lxxii. 462–464, from the *Journal of the Chemical Society.*

THE YELLOWSTONE VALLEY.

Professor Hayden, who has been engaged for four years on a geological survey of the United States' territories, has returned to Washington, and will proceed to prepare his annual report, which will include the survey of the famous Yellowstone Valley. The expedition to that valley left Utah in June, and explored the belt of country to Fort Ellis, Montana, proceeding then into the Valley of the Yellowstone. Professor Henry, Secretary of the Smithsonian Institution, has received a letter from Mr. Elliott, the artist who accompanied the expedition, giving an account of the "Great Cañon," a huge basaltic fissure or rent in the earth, beginning at Tower Creek and ending at the foot of the Lower Falls of the Yellowstone. Hence, it is 25 or 30 miles long. The cañon varies from 1000 to 2000 feet in depth, and along its bottom the river whirls with immense velocity, appearing from above "now a blue and now a snowy riband." The attrition of the stream for ages has worn the sides of the chasm into strange shapes of "towers, points, and pinnacles," and these are "gaily painted by the waters of the numberless warm and hot springs which ooze out from the fissures into a variety of tints and tones, dazzling white, intense red, purple, saffron, yellow, etc., and fairly bewildering the eye, at first, by their singularity and grandeur." The cañon is, moreover, fringed in some places with rows of basaltic pillars, quite regular in form, from 20 feet to 30 feet high, and standing, without crack or flaw, in regular tiers one above the other. The great Falls are more imposing still. They are a "broad, evenly deep sheet of clear ice water, leaping down at one bound 450 feet." Unbroken by any point or division, they rush over the ledge, a vast curtain, as of swift, foaming lace. These are the Lower Falls, the Upper being just the height of Niagara, or 150 feet, and but half a mile distant from the other. Thus, within that short space, the stream makes a descent of 600 feet. But the chief marvel of this section would seem to be the "Geysers of the Firehole Basin." These are at the headwaters of the Madison, and in magnitude and extent of area reduce the famous boiling springs of Iceland to complete insignificance. Mr. Elliott writes:—"I have stood by a crater, and have seen a column of hot (boiling) water six feet in diameter ascend with a single bound, vertically, to a height of 200 feet; pause there for an instant, and fall to its silicified basin in a thousand water streams and a million prismatic drops. This continued for ten or fifteen minutes; then all would be quiet; the water of the cistern became as still as that of a mill-pond, and apparently as inactive. This geyser, which is one of many, we named the Grand. It plays at irregular intervals of twenty-four to thirty hours for ten to twenty minutes. Another, named by Doane 'Old Faithful,' plays at intervals of only an hour apart, throwing up an immense steady column to an elevation of 150 feet." There are fifty geysers and over a thousand boiling springs, according to this authority, within 50 miles of each other; and it is evident that these objects must rank among the wonders of nature.—*Times.*

CARBOLIC ACID PILLS.

The following formula for carbolic acid pills is taken from the *Journal de Pharmacie et de Chimie*:—

Carbolic Acid	3 drops.
Soap Powder	0·60 gram.
Lycopodium	0·06 „
Powder of Gum Tragacanth .	q. s.

For six pills. The first two ingredients make a semifluid mass that the lycopodium does not absorb, but which acquires firmness upon the addition of the gum tragacanth.

The Pharmaceutical Journal.

SATURDAY, DECEMBER 2, 1871.

Communications for this Journal, and books for review, etc., should be addressed to the Editor, 17, *Bloomsbury Square.*
Instructions from Members and Associates respecting the transmission of the Journal should be sent to Elias Bremridge, *Secretary*, 17, *Bloomsbury Square, W.C.*
Advertisements to Messrs. Churchill, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE CHICAGO CATASTROPHE.

"Our pharmaceutical brethren in Chicago have lost by the great fire their College, with its library, lecture-specimens, apparatus, herbarium and furniture." This is the first sentence of a letter from Professor Attfield, published in our correspondence column this week, and to it, as also to the interesting letters of Professor Ebert and Mr. Brady, we call the serious attention of our readers.

So much has been written by the general press about this awful conflagration, and so much public spirit exhibited by our countrymen, that we refrain from picturing the terror and ruin which a calamity so unparalleled must necessarily have inflicted on our English-speaking and warm-hearted brethren of the far West of America.

During the few weeks that we, as a nation, have been cheerfully performing the duty of assisting, in common with other European States, to lessen the widespread misery which this fire has induced, thoughts as to the position of the burnt-out pharmacists of Chicago have, doubtless, passed through the brain of many a druggist on this side of the water.

The letters to which we have referred describe precisely the pharmaceutical situation in that unfortunate city. Its Alma Mater, reared with loving hands and proud hearts, and full of expensive educational appliances, a heap of ruins; the businesses and all the property of six of its wholesale, and forty-six of its retail druggists lost; and the local means of raising the College from its ashes completely cut off.

Under these circumstances we cannot be surprised that through Mr. Ebert, one of its professors, and well known personally to many in this country, British pharmacists should be asked to assist in reinstating it. He conjectures, and in our opinion rightly, that colleges of pharmacy, wheresoever situate, spreading broadcast scientific and practical knowledge, and thus benefiting the profession throughout the *world*, may, in an exceptional case, such as the one under notice, fairly claim some consideration from *every* member of it.

We are sanguine that he will meet with a generous response. Already the President of the Pharmaceutical Society (Mr. Haselden), the Treasurer (Mr. Hills), the President of the British Pharmaceutical Conference (Mr. Brady), and Sir Thomas Dakin (the late Lord Mayor of London), men representing every section of the trade, have willingly consented to act with Professor Attfield as the nucleus of a Committee for collecting books, specimens, apparatus, etc., and funds with which to purchase others.

Parcels, cheques (crossed London and Westminster Bank), and Post-Office orders (payable at High Holborn) will be gladly received on behalf of the Committee by Professor Attfield, 17, Bloomsbury Square, London, W.C., and duly acknowledged in this Journal.

THE REGISTER.—SPECIAL NOTICE.

We have on various occasions called attention to the necessity that every person entitled to be on the Register of Chemists and Druggists should make it his personal business to see that his name and address are correctly given. We are requested by the Registrar again to urge the importance of this matter, and to say that as the Register for 1872 is now in preparation for printing, it is requisite that notice of any former errors, or changes of address since the last issue, should be forwarded *at once* to him at 17, Bloomsbury Square. Local Secretaries also are requested to forward information of any changes that may have occurred in their districts during the year.

As this Register is now the only legal evidence of the right to carry on business as a chemist and druggist in Great Britain, it is important that every entry upon it should be correct, but such accuracy is not attainable without the assistance of all concerned.

SPURIOUS TEA.

At the meeting of the City Commission of Sewers, on Tuesday last, a report was presented from the Sanitary Committee on the subject of the seizure of spurious tea, which well illustrates the present defective state of the law in reference to the adulteration of food. It stated that, upon a full consideration of the circumstances of the most recent seizure, the Committee did not think it expedient to take legal proceedings against the offenders,—experience in past cases giving them little encouragement to do so. They were of opinion that the traffic could be stopped only by the officers of Her Majesty's Customs, and that no local sanitary authority, even if armed with fuller legal powers, would be able to deal with it successfully. They had written to the Secretary of the Board of Customs on the subject, who told them that the officers of that department were not empowered to seize and destroy tea, whether spurious or not, even upon a certificate that it was unfit for human food. They then had an interview with the President of the Board of Trade, who intimated that the Board had no power over the Customs and referred them to the Lords of the

Treasury. They next had a conference with the Chancellor of the Exchequer and Sir Thomas Fremantle, the Chairman of the Board of Customs, but with no better result; both those gentlemen being of opinion that even with qualified inspectors locally appointed, the Customs could not be entrusted with such powers as those suggested, and that such powers if used would have a very injurious effect upon trade, and divert a large amount of business from this country. The Chancellor of the Exchequer considered that nothing further could be done without an express Act of Parliament, and that any application to the Government to introduce such a measure, which probably would not pass, should be made either to the Home Secretary or the Local Government Board. The Committee concluded by expressing regret that there seemed no means open for adoption likely to put a stop to a trade so injurious to the health of the community. The Report of the Committee was approved and ordered to be printed and circulated among the members of the House of Commons and of the Corporation and of the various sanitary bodies in the Metropolis.

The usual Monthly Evening Meeting of the Pharmaceutical Society will be held on Wednesday next, at half-past eight o'clock. The first subject will be the discussion on Mr. Greenish's paper on "Pharmacy in North Germany," adjourned from last month. Professor Redwood's paper on "The Substitution of Proportional Numbers for Specified Weights and Measures in the Description of Processes in the Pharmacopœia," which also stands over from last month, will be the next. A paper by Mr. J. T. Miller on a "Method for the Estimation of Morphia in Opium," and another by Mr. A. F. Haselden, on "The Syrup and Resin of Tolu, Tincture of Cinnamon," etc., are also promised.

Mr. William Robert Grove, Q.C., F.R.S., has been appointed to the Judgeship vacated by the removal of Mr. Justice Collier to the Judicial Committee of the Privy Council. In addition to eminence as a barrister, Mr. Grove has a considerable scientific reputation. From 1841 to 1847 he was Professor of Experimental Philosophy at the London Institution, and he has long been an active member of the Council of the Royal Society. Among many other contributions to scientific literature may be mentioned his famous essay on "The Correlation of Physical Forces," published in 1846 and in subsequent editions. In 1847 he received the medal of the Royal Society for his Bakerian Lecture on "Voltaic Ignition and on the Decomposition of Water into its Constituent Gases by Heat." In 1866 Mr. Grove was President of the British Association at its meeting at Nottingham. He has also devoted considerable attention to the operation of the Patent Laws, and was a member of the Royal Commission appointed to report upon them.

From these antecedents, and the scientific character of Mr. Grove's mind, we may expect that the interests of abstract science, and its applications, will receive, through the influence Mr. Grove will now acquire, official recognition and promotion of the kind that is so much needed, and which can only be rendered by those cognizant of the details of scientific matters.

Transactions of the Pharmaceutical Society.

NORTH BRITISH BRANCH, EDINBURGH.

The First Meeting for the present session of the North British Branch of the Society was held in Craigie Hall, 5, St. Andrew Square, on the evening of Friday, 24th November, at 8.30; Mr. H. C. Baildon, President, in the chair. There was a good attendance; in addition to those connected with the Society resident in Edinburgh, there were present Messrs. Frazer, Kinninmont and Davison from Glasgow.

The President addressed the meeting as follows:—

Gentlemen,—Having been placed by you for the second time in the honourable position of President of the North British Branch of the Pharmaceutical Society of Great Britain, at the commencement of the session I would ask your indulgence whilst I endeavour as briefly as possible to recapitulate events of great importance that have taken place since our Annual Meeting, and which will, I doubt not, exercise a very beneficial influence on this Branch of the Society, and will afford advantages not hitherto enjoyed to the rising generation of pharmacists in Scotland.

It is well known that the Council had for years felt deeply the inadequate resources at the command of the North British Branch; although it had a name, it had no permanent "local habitation," no sufficient library of reference, and but a very imperfect museum; and of these deficiencies we were made still more painfully conscious when, whilst attending the Pharmaceutical Conference, our esteemed friend Mr. Henry Deane, a fellow-worker with Jacob Bell in founding the Pharmaceutical Society, at his own request, accompanied our Honorary Secretary to our rooms in Princes Street and saw the poverty of our resources. Having the honour and interest of the Society deeply at heart, Mr. Deane at once expressed his intention, at the earliest opportunity, to bring the subject fully before the London Council. This he did, in a very able letter, which I hope all of you have seen in the 71st number of the Pharmaceutical Journal, and which may be said to have exhausted the subject, suggesting that the Council should provide funds, 1st, for the rent of a suite of rooms, to be occupied exclusively by the Society, and not as at present, with two back rooms, available only for one night in the week; 2ndly, that our library should be largely added to and amply supplied with all needful works on chemistry, pharmacy and botany; and, 3rdly, that we should have a museum worthy of the name, containing an ample supply of specimens for our examinations.

I quote the conclusion of Mr. Deane's letter. He says, "As an old examiner and as an old member of Council, having taken deep interest in the welfare of the Society from its foundation, I venture to place this subject before the Council, believing it to be one of the greatest importance, about which no time should be lost and no reasonable expense be spared. It is not a question of money, nor the numbers passing their examinations here or there, but it is one of necessity, affecting our character for consistency and good sense and of justice to those young men who have to appear before the examiners, whether in London or in Edinburgh."

When this letter came before the London Council, it was very properly referred to a select committee to report upon, of which our Honorary Secretary and Mr. D. Frazer, of Glasgow, were members. As it was believed that a good deal of misunderstanding existed in the minds of some of the gentlemen composing this committee as to the origin and position of the North British Branch of the Pharmaceutical Society, I,—as being one of the three pharmacists in Edinburgh who met Mr. Jacob Bell in 1851, and since the death of Mr. John Macfarlan and Mr. Duncan, the only survivor,—was requested by the Council in Edinburgh to accompany Mr. John Mackay and Mr. Frazer to London, in order that I might give evidence before the Committee as to what took place prior to our agreeing to go to Parliament for a joint Act. At a private meeting in my house Mr. Duncan, Mr. Macfarlan and myself were unanimously of opinion that we were entitled to be recognized as a distinct branch of the Society in Scotland; that we ought to have an examining board, endowed with the same powers as the examining board in London, and that we must be recognized as such under the Act of Parliament then contemplated. Mr. Jacob Bell—looking upon it as of great importance that this union should be effected for one common object, namely, the advancement of pharmacy in Great Britain—considered our views reasonable and proper, and undertook to recommend them to the London Council; and our members of Parliament, in accordance with our instructions, had the 12th clause inserted, with the consent of the London Council, in the Act of 1851, which fully recognized our standing and powers.

Those who possess the 1st series of the PHARMACEUTICAL JOURNAL will find the full particulars of this arrangement in Vol. XI. pp. 49 and 63, and I am sure it will interest them if they refer to these pages. My best thanks are due to the Committee for the kindness and courtesy shown in permitting me to read a paper going pretty fully into the history of our Branch Society from its origin to the present time; and the result of the deliberations of the Committee was the following resolution:—"It is the opinion of this Committee that it is the duty of the Pharmaceutical Society of Great Britain to provide better rooms in Edinburgh for carrying on, in a satisfactory way, the examinations and for the general use of the Society in Scotland; also to augment the library and museum there. The Council further think that a paid officer should be appointed to perform secretarial and other duties for the Society under the direction of the Honorary Secretary." At the meeting of the London Council on the 1st of November this report was brought up, when Mr. Deane's letter was read, and the following resolution, being a conjoined motion by Mr. Hills and Mr. Sandford, was unanimously carried, "That the recommendations of the Special Committee on Mr. Deane's letter on the North British Branch of the Pharmaceutical Society in Scotland be adopted, and that the President and Vice-President be requested to put themselves in communication with the Council of the North British Branch, to ascertain what fresh arrangements are required and at what cost they could be carried out."

I congratulate the members on the entire success which has attended our efforts in connection with Mr. Deane's letter, and I trust that the increased facilities for successful study which will in a few months be available to our students will be taken advantage of to their fullest extent. To the young students in pharmacy I would say, if resident in Edinburgh, either temporarily or permanently, you will soon possess great advantages. With suitable rooms, open every day, an excellent library of reference, and an ample museum, taken in conjunction with the favourable arrangements made for you by our Honorary Secretary for your instruction in botany and chemistry,—and we trust soon to be able to add also in materia medica,—if you do not avail yourselves of your favoured position you will have cause for self-reproach and unavailing regret in after years. I will not believe that this will be so, but, on the contrary, that you will use the present season of youth to enable you to fill an honourable place in your profession, whilst, at the same time, you will have taken the surest road to success in life. Many years ago I recollect seeing in a solicitor's office in this city the following words, framed and placed conspicuously over the mantelpiece, "Lost between sunrise and sunset two golden hours, each set with sixty diamond minutes. No reward is offered, for they are gone for ever." This may be said of every wasted hour of life. I would say to you, in the language of our great dramatist,—

"To thine own self be true,
And it must follow, as the night the day,
Thou canst not then be false to any man."

And again,—

"Take the instant way,
For honour travels in a strait so narrow
Where one but goes abreast: keep thou the path,
For emulation hath a thousand sons
That one by one pursue: if you give way,
Or hedge aside from the direct forthright,
Like to an enter'd tide, they all rush by,
And leave you hindmost."

Industry, with average abilities, will arrive at the goal before genius without it. Let each of you then recollect that, to some extent, you cannot tell to how great, the continued success of the Pharmaceutical Society depends upon you. You possess advantages for the successful prosecution of the science of which the last generation knew absolutely nothing; but how zealously the founders of our Society have worked for you need not be told, nor how deep a debt of gratitude you owe to our honoured founder, Jacob Bell. Carry on, then, the good work, which has changed a trade into a profession, and I doubt not you will live to see the pharmacists of Great Britain equal to, if not in advance of, the pharmacists of any other nation. The North British Branch has been peculiarly favoured in obtaining the valuable assistance of professors and others of the highest standing, who have contributed scientific papers of great interest at our evening meetings. Amongst others, I may mention Sir Robert Christison, Bart., Professors Balfour, D. Maclagan, Crum-Brown, the late Dr. George Wilson, Professor Archer, Dr. Stevenson Macadam, Dr. Angus Macdonald, and the late Dr. Scoresby Jackson, and I trust we may be equally fortunate in the future; and I venture to hope that masters, assistants and apprentices will consider it both a duty and a privilege to be present on these occasions. The attendance has not always been what the Council would like to see; and nothing will afford me more pleasure as your President, than that it should be good during my year of office.

I cannot close this address without reminding you of the very pleasant and instructive meeting in this city, in August, of the Pharmaceutical Conference, which was declared by one of its founders to be the most successful that has yet taken place. It was a very great pleasure to others and to myself to be privileged to enjoy the society of the very *élite* of our profession, who were members of the Conference.

Very able addresses have recently been given by two much-esteemed members of the Pharmaceutical Society, the one by our Honorary Secretary, at the opening of the London session, and the other by Mr. Stanford, at the commencement of the Glasgow pharmaceutical year. Both addresses were well worthy of careful study by all pharmaceutical students, and are replete with valuable information and advice.

Mr. Mackay and myself, as office-bearers of the North British Branch, were much pleased to receive a very kind invitation from our friends in Glasgow to be present at the opening of the session, and which we had great pleasure in accepting. The cordial welcome and hospitable reception given to us were most gratifying, manifesting the kind feeling entertained towards the Council of the North British Branch by our friends in the West.

At the close of the address, Mr. MACKAY moved a vote of thanks to Mr. Baildon, not only for the excellent remarks which he had just made, but also because he had, for the second time, taken the office of President. One of the earliest members of the Pharmaceutical Society, he had ever been one of its warmest and earnest supporters. On a recent occasion Mr. Baildon had proved of essential service in placing before the Special Committee in London certain evidence in regard to the position of the Society in Scotland, and thereby earned the thanks of the members and all connected with the Society north of the Tweed.

This was seconded by Mr. Kinninmont, of Glasgow, who referred to the time and labour spent by Mr. Baildon and others in Edinburgh in connection with the affairs of the North British Branch, and expressed satisfaction that the Board in Scotland was about to be placed in a proper position.

After a few remarks from Mr. Kemp, of Portobello, in support of the motion, it was carried unanimously and by acclamation.

A paper was then read by Mr. James Mackenzie, on "Pharmacy in Edinburgh in the Olden Time," which is printed at p. 444.

At the close of the paper, the President proposed a vote of thanks to Mr. Mackenzie for his interesting paper, which was seconded by Mr. Aitken, and carried with applause.

The donations mentioned in the following list were placed on the table, and thanks voted to the donors:—

Specimens added to the Museum since April, 1871.—Lactucarium from *Lactuca virosa*, grown and prepared at Edinburgh by the donor, Mr. Thomas Fairgrieve,—Twenty-four specimens of Thallium and its Salts: presented by Messrs. Hopkin and Williams, London,—Zanzibar Aloes, Natal Aloes: presented by Mr. D. Hanbury, London,—Five Poison Bottles of green glass: presented by Messrs. Frazer and Green, Glasgow,—Square Poison Bottle, with india-rubber stopper fastener: presented by Mr. G. W. Sandford, London,—Sassafras Nuts, the fruit of *Nectandra cymbarum*,—Liq. Calumbæ, *Jateorrhiza palmata*, Ceylon; Rad. Calumbæ ver., ditto; Rad. Taraxaci Siccat., dried and sliced roots of *Taraxacum Dens-leonis;* Rad. Scammonii, *Convolvulus Scammonia;* Fol. *Sarracenia purpurea;* Red Gum of *Eucalyptus rostrata*, Australia; Gum Resin Sarcocolla (*Penæaceæ*); Olibanum, Gum Resin of species of *Boswellia;* Juniper Gum or Sandarach, resin of *Callitris quadrivalvis;* Gum Succini, Amber; Resina Tolutani, residue after making syrup; Ext. Aloes Socot. Aquos.; Socotrine Aloes, residue after making extract: presented by A. F. Haselden, President Pharmaceutical Society.

The Secretary reminded the meeting that, in accordance with the resolution of the London Council, it was most desirable that a suite of rooms should be obtained with as little delay as possible, in which to carry on the examinations and the general business of the Society; and, as such accommodation was not easily obtained, the Council would be glad to have their attention drawn to any suitable apartments, and he would therefore willingly receive any notice in connection with this subject. He also intimated that two copies of Roscoe's 'Chemistry,' just published, and also the new edition of Wilson's 'Chemistry,' by Madan, had just been added to the library.

Provincial Transactions.

NOTTINGHAM AND NOTTS CHEMISTS' ASSOCIATION, 1871-72.

The Fourth Session of this Society was inaugurated on the 3rd of November; the President, Mr. J. H. Atherton, F.C.S., in the chair.

The preliminary business, consisting of the election of members, announcements of donations to the Society, etc., having been disposed of,—

The President delivered the introductory address; dwelling on the importance of the work of provincial associations, and urging upon all the necessity of supporting them, the members, by their subscriptions and attendance at the meetings; the associates by their attendance at the lectures, and by their increased attention to business. He then reviewed the work of the past session; dwelling particularly on those questions in pharmaceutical politics which have engaged the attention of the trade during the past twelve months, congratulating the members on the unanimity and heartiness which had characterized all their discussions. The question of "aid to provincial associations" was thoroughly discussed; statistics given to show the necessity of the establishment of some principle of assistance from the Pharmaceutical Society, on a broad and comprehensive basis. He (the President) argued that certain centres of education should be established, with an area of about twenty miles, so that not only the young men in the large towns, but those in smaller towns and villages might have means of education within their reach and at a reasonable price. The same necessity existed for that education in all classes, and yet how widely diverse were the conditions! He thought that the assistance required would only be of a temporary nature, but it should be generously given. The special need of cheap instruction would not be required in a few years; but he (the President) held that, until five years had elapsed from the passing of the Pharmacy Act, they were bound, in the provinces, to give the best instruction they could for the least money; after that time, existing interests having been considered, proper fees could be charged, and then the provincial centres would be self-supporting. Assistance could not be better bestowed at the present time, than by the proper establishment of these centres,—fitting up rooms for library, museum and classes, and, in some cases, by grants towards lectures, for a year or two, where there was a difficulty in engaging suitable men out of the present funds of local societies. He thought that the generous efforts made by provincial men in the cause of education should not only have the sympathy, but the support of the Pharmaceutical Council, and that instead of throwing cold water on such efforts (and he was sorry to say there was an inclination to do so, by persons knowing little of the requirements of young men throughout the country), every encouragement should be given; their difficulties, educationally, increased in inverse ratio to the size of the town. It was the smaller places where the greatest amount of encouragement was needed, and where the greatest amount of help should be given.

The President then alluded to the apathy existing in many places amongst the students with respect to their attendance at the classes provided for them, and made an earnest appeal to those present to realize their position, and the necessity of getting what education they could while they could. He then dwelt at some length on the relations which do now exist, and which ought to exist, between a master and his apprentice in respect to education; and drew a vivid picture of the different position an apprentice now occupied to what he did some twenty or thirty years ago.

Reference was made to the unsatisfactory nature of the apprenticeship system. The President stated that he hoped and believed that in a little time a more satisfactory condition of things would be established. In conclusion, he announced the arrangements which had been made for the coming session, and expressed a hope that members and associates would unite with the Council in promoting the objects the Society had in view; and that by such unity they might attain strength and endurance to carry out the work successfully.

At the conclusion a cordial vote of thanks was accorded to Mr. Atherton for his able and practical address.

Papers have been promised for the monthly meetings of the Society by the President, Mr. Rayner, Mr. W. P. Williams and Mr. Mayfield.

The Committee beg to announce that arrangements have been made for the delivery of two courses of lectures, in connection with the School of Pharmacy, at the rooms of the Society, Britannia Chambers, Pelham Street, by Dr. Soutar. Inorganic Chemistry, every Tuesday evening at 8.45, commencing Tuesday, October

31st. Structural and Physiological Botany, every Thursday evening, at 8.45, commencing Thursday, November 2nd. Nominal fee to each course, *5s.* The introductory lecture in each course will be free to all connected with the trade. The Council particularly request that all young men, who can conveniently attend, will do so, whether connected with the Society or not.

LEEDS CHEMISTS' ASSOCIATION.

The Members and Associates, with several chemists and druggists, numbering nearly ninety persons, met at the Trevelyan Hotel, Boar Lane, Leeds, on Wednesday, Nov. 22nd, 1871, at eight o'clock; the chair was taken by the President, Mr. E. Brown, who delivered the following address:—

Gentlemen,—The advantages of association have been recognized amongst men from the earliest periods. All social and political organizations depend on the impression that, by mutual concession and co-operation, the interests of all so sharing are promoted. Monarchies, republics and empires are but the development of association on a national scale. Let there be first the sense of profit by union, and then will the system, whether crude or complex, to achieve the objects for which the union is designed, spontaneously follow. The associations for the useful direction of energy and enterprise, of capital and skill, of benevolent and philanthropic effort, with their immensely varied objects, that have of late years been formed with such marvellous rapidity, and many with such surprising results, have been for the most part induced by the increase of population on areas long occupied, or by migration to lands before almost unpeopled, and the opening of regions previously unknown. The circumstances calling into being these associations we cannot sever ourselves from,—circumstances that at once demand and promote degrees of mental activity such as probably have never had a parallel.

We live in an age when even that most rude and destructive of arts, the art of war, requires for proficiency in it much patient and scientific study. Does it not behove us, then, engaged as we are in a peaceful and beneficent occupation, to avail ourselves of the aids and advantages secured by mutual association? There are many aspects other than that whence I have ventured to approach our sphere of thought that might convey impressions of the value of union, but, tempting as they are, we have neither the time, nor is this the occasion, to review them. It may be well, however, at this social meeting, before we pass on to subjects immediately concerning us as pharmacists, to notice a few of those inducements to union or association for the promotion of our social and intellectual advancement that have special claim on our regard. The various associations for objects almost without number that exist demonstrate, if demonstration were required, that the experiment of association is conclusively in their favour. Associations and companies often fail of their object, and so of continuance, either because attempting too much, or of being composed of inharmonious elements. It is to be hoped that our friendly union is not endangered by these sources of non-success. The slight claims on our time, our money and our patience are surely counterbalanced by the advantages of our formation into a society. We do not incur responsibilities that can in any degree make union irksome; while there are advantages in association that cannot be had without it. We do not mine to sink our capital, nor speculate in steamy and gaseous evaporations to give it wings. We do not lay rails or make roads on which our means may run away, nor embark to wreck our resources in mid ocean. We do not bind our several interests so closely that dissolution would be a happy release, nor yet is our affinity so insensible that disintegration should be a natural consequence. To harbour the notion that connection with our association lays a man more or less under obligation to reveal anything that might prejudice his personal interest, so far as that interest is not also common to all, is a delusion that incurs more loss to any one who may entertain it than it can possibly to those who do not.

The whole history of pharmaceutical associations, whether in London or the provinces, goes to establish the fact, that those whose position makes them more independent than others of such union are the most ready to communicate what promotes the welfare of their fellow-members. And if there is one lesson more than another that friendly intercourse with colleagues in our art teaches, it is that the aids and the hindrances, the perplexities and the encouragements, falling to the lot of each one are much the same as those that affect all. Our several circumstances, as our separate formulæ, are left intact by our union; but what contributes to the good of all is by it secured alike for each. The very recognition of mutual interests is hopeful and healthful to us in the conduct of business; a fact the more we appreciate, the less we shall have to suffer. The long and anxious hours we have to give to our occupation, while in some respects hindrances, should be in others inducements to our being associated. Our union may be one of the best steps towards lessening the time and lightening the care of our daily round of duty. To be "out of" fashion in some things might be a virtue, but not to be in fashion in the matter of our association, society tending with events as they do, would be a weakness and a loss. We have not so far achieved by our union results to exult in; but we have results quite sufficient to encourage us to persevere. Since our earliest meetings at 13, Briggate, our progressive steps have been steady if not swift, and while our position now is but a modest vantage to have been attained by the engagements of a succession of years, we can from this position look forward with hope that our association, with increased efficiency, will promote the objects for which it was formed. The incidents and the apparatus of our local society are not without interest. That so many of us have formed friendly acquaintance, and so solved down the trade jealousy that is so much the child of ignorance, is surely cause for satisfaction. We have learnt something of each other's weaknesses, and with this knowledge composed ourselves by deliverance from the dread of mastery, and we have seen something of each other's virtues, and so learned to respect those who, with weapons like our own, are daily fighting the battle of life. This acquaintance, too, must infuse into the competition, unavoidable by the proximity of our places of business to each other, more of honour than without it would prevail, and the public also partake of the benefit thus derived from an improved tone in our business transactions. Our winter evening meetings are times of refreshing mental stimulus, whether to those who lead or those who follow the train of thought directed to the subjects that in those meetings come before us; and the organization of our local society, simple as it is, enabled us to take a practical share in stemming the tide of vexatious parliamentary interference in our shop arrangements that threatened the chemists of this land last session; and, if need be, our association, not as an object, but as an incident, of its existence, would serve a like end again; and here it may be remarked that the chief aim of our association, as is that of the Pharmaceutical Society, however some of its members may have overlooked the fact, is to bring about such a state of things in our body as to render government interference in the conduct of our pharmacies quite unnecessary.

It is at once our interest and desire to accord with the action of the Pharmaceutical Society, most heartily and earnestly; but when some members of that Society are led to esteem certain fetters as decorations incumbent on all practising the art of pharmacy, it is for us, with respect and decision, to affirm our purpose to maintain, if possible, undecorated freedom. The standard of professional education required by the Pharmacy Act comprehends the best regulations for the storage and dispensing of poisons, while the time, study and cash involved in attaining that standard, along with all trade considerations to precautions against accident, are the best guarantees that any open suggestions coming from the Council of the Pharmaceutical Society as safeguards at once to chemists and the public will be welcomed and adopted where requisite and applicable; and before we leave what may be termed the incidents of our association, may be mentioned the facts that our associates are privileged to attend at members' fees the lectures on chemistry given at the Mechanics' Institution and at the Young Men's Christian Association, and, lastly, the handsome donation of £10 from the Pharmaceutical Society for the purchase of books now added to our library.

The apparatus of our association may be expressed in a few words:—Cabinet of materia-medica specimens, library, diagrams and maps; the occasional courses of lectures given, the classes for instruction in Latin held, the room we rent for these uses, and may be added the monthly meetings. It would have been cheering had we been enabled to report that these facilities for improvement were more largely used than they have been, specially by the young men for whom they are chiefly intended; at the same time, these advantages have not been without fruit, in aiding several to fit themselves for passing the degrees of ordeal required by the Pharmaceutical Society. It may not be out of place here to remind those who seek instruction, and would receive from our association what it is capable of yielding, that our classes can consist only of those who attend; that the interest of teacher or lecturer may be raised or depressed by the number and the application of those who form his audience. With the admirable chemical courses accessible to our students, it would be a doubtful gratuity on our part to attempt the establishment of lectures on chemistry; but could we secure, as we should do, a sufficient number of earnest learners to form a good class for the study of materia medica and botany, each one composing such a class would be a benefactor to his companions by contributing his share to inducements to the maintenance of the class he attended. Our association affords facilities for the establishment of some such course, and all who are interested in the success of the association would be gratified by seeing that the gifts and their care designed to make our society a source of good to its younger members, have in this important particular secured practical results.

It has been pronounced in various quarters that now that the Pharmaceutical Society has, in consequence of the Pharmacy Act, become more an examining than an educational body, its educational functions will soon expire. While I am not prepared to endorse that opinion, it cannot but be evident to us all that the Pharmaceutical Council cannot undertake the education of the large number who have to pass the scrutiny of its examiners, and consequently that pharmaceutical education and the various appliances that promote it, must, for the most part, be conducted in the provincial centres, accessible to those aspiring to be the pharmacists of our land.

And now I may be permitted the expression of a few thoughts bearing on the examinations—a subject that concerns us all, whether instructors or instructed; and because so much has been said, and said so well on this topic, I shall occupy but little of your time with it. It may be said that the enlightenment of some, and the ignorance of others, who favour us with their custom, are reasons why we should be equal to the position we assume, and the duties we undertake. Society, whether by its intelligence or its confidence, requires in us the ability to acquit ourselves of the responsibilities of the place we occupy in it; and on this hangs the claim for evidence of proficiency in the art we practise.

We live in times when value of all sorts is being weighed, measured and sifted, and these are the conditions, and not from any ambition on the part of the Pharmaceutical Society, or whim of the Parliament, that brought into being the inevitable Pharmacy Act. We cannot sever ourselves from the circumstance; nor would we. It lays on us obligations, but it brings to us hope. With the demand comes the recompense, and with the test the pledge that merit shall not go unrecognized. Your minds may for the moment revert to the prevalence of shams and delusions in our day—shams in science and in art, in commerce and religion, and indeed in every region of thought and practice that sham can invade; but what do these intrusions of the false on the precincts of the true imply, other than that real worth has a place in the esteem of men? and hence that the counterfeit borrows credit only from its likeness to the standard coin. Gems of "paste" and gold-"washed" jewellery find acceptance, inasmuch as they signify that there are things of more value than they are. Influences similar to those that induced the Pharmacy Act have developed the more extensive measure of State education; so that it is well for us, even for our own sakes, to be informed by appointed examiners of our sufficiency or insufficiency to respond to the expectations of an educated public; not that it is probable that the instruction given in our national schools will lift many above the ordinary mental status of those who practise pharmacy, but the advanced education given to the people will dispose and enable them to look for a corresponding advance in our attainments.

From these observations it will be manifest that the institution of examinations in pharmacy, as in anything else, is not to ascertain whether the candidates can just endure the appointed ordeal, but as data whereon to assure the public of their competence to meet the expectations they would raise in the minds of others by the offices they proffer to render to society at large.

The details of the examinations and the numerous aids to preparation for them, have never been more ably discussed than in addresses that have recently appeared in the pharmaceutical press,—addresses that I would commend to the studious perusal of our associates rather than occupy your time by attempting to reiterate their contents. Having noted the source and the reasonableness of the examinations, permit me to say a word or two on the motives to readiness for them,—they are but appeals to the honour of those who would approve themselves to their countrymen. We ask for respect, support and confidence; and we do not pretend to return for these full value in the wares we vend. The balance to material is to be given in the form of *skill*, and, by examinations, we prove we have secured that article, and so in fairness can expect remuneration for it. It is, then, for us but to demonstrate by our whole deportment that we supplement our goods with our qualifications. Fit yourselves for the place you aim at in society, and that will comprehend fitness for the examinations.

Before closing, I now venture a few suggestions to our students, affecting not only the examinations, but your position and progress. It is well to remember, plain as the fact is, that our shops are neither schools nor colleges. We must learn trade as well as science. From practice we have to filter theory, and our province lies in art applied. These thoughts often present may sustain our aspirations while they suppress discontent.

Do not weary of the routine of your daily occupation; repetition is but the confirmation of what we learn. It takes about two years to convert the recruit into an efficient soldier. The novice might during the first week he wore regimentals understand what it was to march and to halt, to load and to fire, to fall into line and to form solid squares and all the etcetera of ordinary martial drill, and, because he knew so much, conceit himself an able soldier; overlooking the most important part of his training,—the education of his limbs to prompt and easy obedience to command. *Our* limbs, too, require education; we need line upon line, and personal experience in the old proverb that practice makes perfect. We were not born chemists and druggists; we become such by training. The young child is prompted to eat by appetite for food, and to walk from desire to lay hold on what is not within its reach; yet to perform these acts respectably, it has to repeat them countless times. The child has to discover by practice the uses of association in its body. It has to accustom each tendon and muscle to respond in harmony with every other to the mandates of its will, before it can with ease and pleasure acquit itself of the simplest exercise. How evident is it, then, that, to arrive at dexterity in our art, we should educate our bodies to the duties we impose on them. The common expression that some men have more sense in their little finger than others have in their whole body, is not inapt, and illustrates what I wish to impress. To this end I would say, let the eye accompany the hand. He who leaves his hand without the guidance of his eye consigns himself to work in perpetual twilight and cancels his title to success. Proficiency in manipulation once secured, labour becomes a pleasure, and occupation rest.

And now, to turn from physical training to mental culture, I have just two thoughts to set before you,—patience and directness; the one says, hold on and wait; the other says, do not wander. To achieve success nothing can compensate for work; not the best opportunities nor the brightest genius. Ability is mainly the faculty to endure. He who is accustomed to patient and steady application is the man of ability; is the man who, with an object once clearly before him, will persevere until he grasps it. It is to be regretted that power of mental endurance is not more generally trained than it is; so much is "ready done" now in our day-schools to save brain-work, that most young men have to learn what mental application means when they should be availing themselves of its practical advantages. There is no faculty of the mind more capable of education, on the one hand, and more dependent on education on the other, than the faculty of sustaining effort. What gymnastics can do for your limbs, this training can do for your wits. Avoid desultoriness; you can scarcely meet a greater foe. The very diversity of our occupations almost tempts to this weakness; but, on the other hand, it affords sufficient variety to dispose you to directness in application to study. Do not use many books; you have not time for them, and they will only divide your thoughts,—one thing at a time, and that one thing do well. You are engaged in a trade or business, as well as giving yourself to study, so digest a few well-chosen books, that they will put you further on; and do not lose time over every bit of "printed matter" that falls in your way; you might as well set yourself to talk with every person you meet. We cannot each excel in every department; it would not be natural for us to be all alike. Let those who have special aptitudes make these the recreation of their study, and so save strength for those subjects that might otherwise be their victors. Thus cherish patience and directness in application to work and to study, and there will be left no place for doubt; true ability will be yours. So nature ever prompts us to industry and economy; it knows neither slumber nor waste. The life of organisms and affinities is ever vigilant towards opportunity for construction; cellular and crystalline forms set before us alike lessons of activity and appropriation in the materials we handle every day.

In closing these remarks allow me, with all deference and consideration, to add, that as a most important collateral to success,—Beware of and shun any vice as a blight that would destroy all good and noble aspiration, and would sow in your heart the poison seeds of disregard for what is pure and true.

As much as crystals, whether of the square prismatic or of the doubly oblique systems, owe their forms to the forces within that attract around their nuclei in directions peculiar to each, so individual character grows into what it becomes by the inner life that actuates it.

We have briefly reviewed association as affecting national life,—as inducing commercial, scientific, and benevolent organizations. We have noted some of the incentives to association, such as the migratory tendencies of our day, that these and other enterprises affect us. We have observed what association might be expected to do for us, what it is doing, and how it may do more; how students unitedly seeking knowledge for themselves confer advantages on their companions. We have noticed the importance of provincial arrangements for pharmaceutical education. We have seen some of the causes for the establishment of examinations, their reasonableness and consequent motives to preparation for them; the mental qualities and bodily training that our business requires, with a few hints on the education of the limbs, the head, the heart.

Surrounded as we are by energies effecting important changes in the condition and expectations of men, it is for us, associated though we may be, to bear in mind that each one, consciously or unconsciously, receives of and gives something to the character that the age wears. So, like every particle of the material world on which falls the light of heaven, returns the ray suited to its capacity, contributes its share to the whole landscape,—may we with like truth respond to the influences that can best enable us to fulfil the object of our being.

Mr. Smeeton then read a paper on "Early Closing and Prices." He alluded to the acknowledged difficulties attending the discussion of these subjects, arising from the varying conditions under which different businesses were conducted. But he expressed a decided opinion that chemists and druggists, both master and man, worked too long and too late, and charged too little for it. He thought that an improvement in the hours of business would only be effected by each individual acting for himself, without too much reference to the conduct of others. With regard to their charges, they had been stationary while all other prices had increased. Twelve months ago a price-book had been compiled. In Leeds it has worked very well. Some have not kept to it, but all have found the good of it. It only wanted the addition, which was hinted at, but never absolutely insisted upon, namely, that every prescription should be marked by the first who dispensed it, and then we should not have any disparity of prices. It was assumed that the tariff price was charged, but he did not think that exceptional prices, whether higher or lower, were always marked. There were several copies left, and it was proposed to supply them at 3*d*. each, which would make them so cheap that they would be worth buying as a useful memorandum, even by apprentices and assistants for their own use.

At the close of the paper, Mr. Smeeton proposed a resolution, "That this meeting desires to express its strong conviction that our hours of business are needlessly long, and urges upon the chemists of Leeds the propriety of closing their shops at an earlier hour."

Mr. Holmes had pleasure in seconding the resolution. He quite agreed with Mr. Smeeton, and had already given practical effect to his thoughts by closing at 7 p.m. with the exception of Saturday, when he closed at 10 p.m.

Mr. Jefferson (Vice-President) hoped every one present would carefully consider the questions introduced in the last paper. It was very desirable that there should be more unanimity; and he thought, had early closing been the rule of to-day, they would probably have had some present this evening who were with them in spirit but not in person. He had pleasure in supporting the resolution.

Mr. Longfield felt the subject of early closing was one of great importance, and if the public knew that chemists' shops were closed earlier, he had little doubt they would remember the want of medicines as well as of groceries.

The resolution was also supported by Messrs. Stead, Abbott and Manfield, and was carried unanimously.

It was resolved that the President (Mr. E. Brown), Messrs. Abbott, Smeeton, Jefferson, Holmes and Simpson, should constitute a committee to give practical effect to the resolution.

Mr. F. Reynolds announced that the committee were enabled to offer four prizes for the best papers written by associates upon the following subjects:—"The Preparations of Iron, officinal and non-officinal;" "Cinchona Bark, the history, varieties, preparations of, and alkaloids obtained from;" "Rhubarb, its history and preparations;" "Magnesia, and its officinal preparations," the two last subjects to be competed for by associates under twenty years of age. No prize would be given unless two or more papers upon each subject were sent in to the Honorary Secretary, Mr. E. Yewdall.

Mr. W. A. Wood was glad to observe the Society so vigorous, and urged upon associates the necessity of making proper use of the present opportunities.

Mr. Geo. Ward proposed a vote of thanks to the chairman, which was seconded by Mr. E. Thompson, and carried unanimously.

Proceedings of Scientific Societies.

SOCIÉTÉ DE PHARMACIE—PARIS.

At the sitting of this society, on the 4th October, under the presidency of M. Lefort, M. Stanislas Martin presented a report of an analytical investigation on the flowers of false ebony (*Cytisus* sp.) which he had undertaken in consequence of some poisoning accidents that had been caused by them. He had been assisted in his researches by MM. Marmié and Husemann, who had obtained cytisine from the husks and seeds of that tree. M. Stanislas Martin has found that alkaloid in the flowers, and has besides extracted from them glucose and an acid that he has named cytisic acid. He presented to the Society specimens of this substance, and of the flower from which it had been extracted.

M. Soubeiran announced that he had just received from M. Van Gorkom specimens of cinchona barks cultivated in Java. The species represented were *C. lancifolia*, *officinalis*, *Calisaya* and *Hasskarliana;* of the two latter species there were barks, branches and roots. The culture of cinchona in Java, as shown by a report recently issued by the Dutch Government, was in a prosperous state, and did honour to the intelligent supervision of M. Van Gorkom, who had collected this year 11,000 kilogrammes of well-dried barks. Half of this quantity was retained in Java, for use in pharmacy and for the preparation of quinium, the finest barks alone being exported to Europe.

M. Petit read a communication from M. Hardy, chief of the laboratory of the Pharmacie Centrale, in which it was stated that if kirsch gave a blue coloration with guaiac resin, it showed that, besides hydrocyanic acid, it contained traces of copper. The presence of alcohol was necessary to this reaction. If it did not take place in cherry-laurel water containing copper, it was because of the absence of alcohol; and M. Hardy described a process for detecting small quantities of alcohol in water, that was founded on this principle.

M. Petit referred to the blue colouring matter that he had obtained from eserin (physostigmatin), and claimed that, although a passing coloration had previously been observed by MM. Vée and Duquesnel, he was the first to obtain a definite substance, of intense colouring properties, crystallizable, and giving, in a toxicological point of view, a reaction seldom equalled among the alkaloids. He also described to the Society a process that he employed for the direct preparation of sulphate of eserin, without having recourse to the distillation of etherized liquors.

M. Limousin made some remarks upon the method of administering medicines by means of gelatine, now adopted in Sweden and elsewhere, and expressed a doubt whether it was applicable in all cases; for example, an emetic such as ipecacuanha, where it was necessary that the medicine should come immediately and entirely in contact with the fluids of the stomach.

M. Grassi said that, although the Swedish pharmacists claimed to succeed in dividing the doses with great exactitude, he believed that in practice there would be considerable difference in the quantity of the medicine contained in different squares of gelatine, as it was impossible to obtain sheets of that substance of the same thickness throughout.

SOCIETY OF ARTS.

Dyes and Dye-Stuffs other than Aniline.*

BY DR. CRACE-CALVERT, F.R.S.

Lecture II.

Red Colouring Substances (continued).—Munject; Campechy Peach, Sapan, Cam and Bar Woods; Alkanet Root; Safflower; Cochineal, Lac Dye; Murexide.

(*Continued from page* 437.)

Sandal, Cam, and Bar Woods.—The next class of dye-stuffs which we shall have the pleasure of studying together are derived from several varieties of the genus *Pterocarpus*, which are indigenous to the tropical parts of both the new and the old world. It is principally from the East Indies, Ceylon, Madagascar and the coast of Malabar that santal, sandal, or red sanders wood is imported, whilst cam and bar woods are procured from Sierra Leone.

The colour-giving principle of this class of plants is only developed with age, the young branches not containing any, whilst it is found in large quantities in the trunk. Professor Bolley proved that it is the same colour-giving principle which exists in each variety, and he gave it the name of santaline. MM. Wagermann and Haeffely consider that it has the formula $C_{15}H_{14}O_5$. It is a bright red crystalline powder, insoluble in water, but soluble in alcohol, ether, and acetic acid. The latter solvent yields the colouring matter to albumen, which is an important fact, and may one day be rendered practically useful. Santaline is freely soluble in alkalies, giving a violet-red solution, from which acids precipitate the colouring matter.

Sandal-wood is chiefly used on the Continent, where it is employed to give a bottom† to cloth which is to be afterwards dyed with indigo. By this process a very fine blue is produced, having a purple hue by reflected light.

Cam-wood, and especially bar-wood, is chiefly used in England for producing on cotton yarns brilliant orange-red colours, known as mock Turkey-reds. They are, however, neither so fast nor so bright as the real Turkey-red produced from madder, and are easily distinguished from it by yielding their colour to a hot soap solution, or to alkalies.

Alkanet.—The root of the *Anchusa tinctoria* contains a beautiful red resinous principle, to which Professor Bolley assigns the formula $C_{35}H_{40}O_8$, which is inso-

* Cantor Lecture, delivered Tuesday, Feb. 14. Reprinted from the *Journal of the Society of Arts.*

† This term is used in dyeing, to denote that a colour is applied to a fabric with a view of giving a peculiar hue to a dye which is applied after it.

luble in water, but soluble in alcohol, ether, and bisulphuret of carbon. To all these solvents it communicates a fine purple colour, which becomes blue on the addition of an alkali. It is not at the present day employed as a dyestuff, its chief uses being in pharmacy to colour medicines; in perfumery, to colour oils and greases; and in domestic life to give a tint to the lime-wash used for the walls of private dwellings.

Safflower.—Although this dye-stuff has lost much of its value since the discovery of the aniline colours, it is still extensively used in Lancashire for the production of peculiar shades of pinks for the eastern markets. It is also used for dyeing red tape, and I know no more striking instance of red tapeism than the love which is shown for this particular dye by the users of this article. Much cheaper pinks can be produced from aniline, and, notwithstanding that many times the attempt has been made to introduce them, it has in every instance failed, because the exact shade has not been attained.

Safflower is the bloom of a peculiar thistle called *Carthamus tinctorius*, which is cultivated in France, Egypt, Spain, Italy and India. In France and Spain, the small flowers composing the heads of the thistle are picked off and dried in the shade, whilst in Egypt and India they are squeezed, washed with cold water to remove useless materials, slightly pressed into lumps, and dried in the shade; the latter have about double the value of the former. The safflower so prepared only contains three to six parts per thousand of the colour-giving principle.

This principle has received the name of carthamic acid, and has the formula $C_{14}H_{16}O_{14}$. A solution of this acid, when dried on a polished white surface, leaves a varnish, having a beautiful red colour, by transmitted light, whilst it assumes the iridescence of cantharides when seen by reflected light. It is insoluble in water and ether, but soluble in alcohol. This solution becomes yellow on the addition of sulphuric, nitric, or hydrochloric acid. It is also turned yellow or orange by weak alkalies, and the colouring matter in this latter solution undergoes rapid alteration if exposed to the atmosphere. It is owing to the fugitive nature of the colour and its easy modification by acid and ammoniacal vapours, that the delicate pinks produced from safflower have been so successfully replaced by the pink aniline dyes.

To prepare carthamic acid, safflower is introduced into bags and washed, till a yellow colouring matter, which it contains, is removed. It is then mixed with water, to which is added 15 per cent. of the weight of safflower taken of crystallized carbonate of soda. After two hours' maceration, the liquor is run off, and cotton yarn dipped in; then lemon juice or citric acid is added to liberate the carthamic acid, which fixes itself on the yarn. Up to this point, the process is the same as that adopted in dyeing fabrics, but to obtain the acid it is necessary to treat the washed cotton a second time with carbonate of soda, which dissolves out the carthamic acid, leaving a second yellow colouring matter fixed on the cloth. The carthamate of soda thus obtained is decomposed by tartaric acid, and the carthamic acid falls as a brilliant red amorphous powder, which, when mixed with a little water, is sold as safflower extract, and when dry and mixed with ground talc, is employed as *rouge* by ladies.

There is a particular extract extensively used in dyeing, the preparation of which is a secret. Its value depends on the fact that the carthamic acid is rendered soluble in water.

Cochineal, Kermes, Lac-dye, and Murexide.—I shall now call your attention to four colours derived from the animal kingdom, namely, cochineal, kermes, lac-dye, and murexide.

The first three are distinct species of a peculiar tribe of insects called *Coccina*. The females, from which alone the colouring-matter is derived, form a mass nearly destitute of limbs, and remain attached to one spot on the plants infested by them. The males, on the contrary, are very minute and really elegant creatures, furnished with a single pair of filmy wings. The real cochineal is called *Coccus cacti;* kermes, *Coccus illicis;* and lac-dye, *Coccus lacca* or *ficus*. They all contain the same colouring principle. Although the dyes derived from some species of these insects were well known to the ancients, and were much used in Persia and India, the true cochineal has only been known in Europe since the discovery of America by the Spaniards; and since the year 1830 only has it been propagated in the Canary Islands, the island of Teneriffe, Java, and Algiers. The best qualities are still obtained from the republic of Honduras.

The *Coccus cacti* lives on a species of cactus called the *Cactus nopal* or *Opunta coccinilifera*. This plant is indigenous to Mexico, where it grows in the wild state; and from it large quantities of cochineal are collected. It is also extensively cultivated by the native Indians, who often have plantations containing 60,000 plants. The cochineal obtained from the two sources is of different quality; that from the cultivated plant is much superior, and is called *mestique;* that collected from the wild plant is called *sylvestra*.

I will now explain, in a few words, how cochineal is propagated and prepared for market. In the month of May, in the flat lands, and in November in the mountainous districts, the Indians take the stems of the cactus, which they have preserved from a previous crop, and remove from them the young female insects, which are placed on the growing plants, where they grow and multiply with great rapidity. After a period of about three months, the insects are collected into small tin dishes, so formed as to enclose the bottom part of the plant, and by means of a small brush they are swept from each stem successively into it. They are then destroyed, either by being thrown into hot water and afterwards dried in the sun, or in stoves, which gives the black cochineal, called *zacatilla*, or they are placed in a bag and stoved at once, which leaves upon them that peculiar lustrous appearance which characterizes the silver white cochineal, called *blanco*. Although one pound of cochineal contains 70,000 insects, there are millions of pounds imported into Europe every year.

If one of the dried insects be placed in warm water, it swells and takes a hemispheric form, when its structure can be seen. If it is pressed between the fingers, thousands of little red grains are exuded, which, if placed under the microscope, are seen to be minute cochineal insects.

The colouring principle was first isolated in an impure state by Pelletier, who considered it to be an azotized compound. MM. Arppe and Warren de la Rue, however, found that it contained no nitrogen, and that it had the formula $C_{14}H_{14}O_8$. As it had distinctly acid properties, they gave it the name of *carminic acid*. M. Schützenberger proved that carmine is composed of carminic acid and an organic azotized base, called *tyrosine*.

MM. Arppe and Warren de la Rue obtain crystallized carminic acid by the following process. The cochineal is treated with ether, to remove fatty matters, then boiled in water. An acid acetate of lead is added to the solution thus obtained, which precipitates an insoluble carminate. This, after being washed carefully, is decomposed with sulphuric acid, the carminic acid being liberated. The aqueous solution is evaporated to dryness, and the mass treated with alcohol, which, on evaporation and cooling, yields it as a crystalline mass.

As shown by the above process, carminic acid is insoluble in ether, but soluble in water and alcohol. It is dissolved without decomposition by concentrated sulphuric and hydrochloric acids. Carminic acid yields on fabrics, especially on wool, one of the fastest colours known, light and air having no action on it. Chlorine, however, easily destroys it. An aqueous solution of the acid gives the following characteristic reactions. With caustic alkalies, it gives a beautiful crimson-red colour; with oxymuriate of tin, it gives a red precipitate; and with cream of tartar or oxalate of potash, an orange-red precipitate. Alumina removes the whole of the colouring-matter from an aqueous solution. As cochineal is an expensive dye-stuff, it is subject to much fraud and adulteration. One of the most common frauds is practised at Nismes and other places where perfumery is largely prepared. The cochineal in those localities is put into water for a short time, by which a part of its colour is extracted; it is then dried, and either sold as black cochineal, or placed in a sack and shaken with talc or sulphate of lead, and sold as white cochineal. This fraud is easily detected by grinding the cochineal and mixing it with water, when the talc or sulphate of leads falls to the bottom. Good cochineal does not leave above five or six per cent. of ash.

It is often advisable before buying cochineal to determine its tinctorial power. This may be ascertained by two or three methods. In the first, equal weights of the cochineal to be assayed, and of one of known value, are treated with alcohol or a solution of alum. The solutions thus obtained are poured into tubes and placed in a colorimeter. This is an oblong box, which has two apertures at each end and two on the top, in a direct line with the end apertures. The tubes are placed through the openings on the top, and on looking through the end apertures, any difference in intensity of colour between the two liquids can be observed. If a difference is detected, alcohol or water is added to the stronger liquor until there is perfect uniformity of tint. According to the amount of dilution required is the relative value of the cochineals.

A good process was published by the late Dr. Penny, of Glasgow. It consists in exhausting a gramme of cochineal with fifty grammes of potash solution, and this extract is further diluted with 100 grams of water. The solution thus obtained is mixed with a graduated solution of ferricyanide of potassium (one gramme of salt to 200 grams of water) till its colour changes to a dark brown. A solution of bleaching-powder of known strength can also be used for the same purpose. The best method consists in dyeing equal surfaces of flannel in a bath composed as follows:—

For Scarlet Tints.

	Grams.
Water	1250
Cream of Tartar	2
Tin Composition	2
Cochineal	1

For Crimson Tints.

	Grams.
Water	1250
Cream of Tartar	0·75
Alum	1·50
Cochineal	1

The pieces are then washed and dried, and by a comparison of the relative intensity of shade the value of the cochineal is determined.

The chief employment of cochineal is for dyeing wool, but it is also employed in calico printing to produce pinks and reds in steam styles.

It will no doubt be interesting to you to know how to determine whether a pink has been produced from a dyewood, a cochineal, or from madder. All these colours are destroyed by chlorine or bleaching-powder. A boiling soap solution destroys the wood pinks, communicates a crimson hue to the cochineal dye, and brightens the madder colour. Dipped in a rather dilute solution of hydrochloric or sulphuric acid, fabrics dyed with cochineal are not affected, while those dyed with madder or woods assume a yellow tint, which becomes purple when placed in milk of lime. These cloths, however, if subsequently soaped, will yield their colour if dyed with wood, but not if dyed with madder.

Ammoniacal Cochineal.—When one part of ground cochineal is left in contact with three parts of ammonia for several weeks, a chemical action ensues, by which the ammonia loses one equivalent of hydrogen, which unites with an equivalent of oxygen of the carminic acid, giving rise to water and an amide compound, carminamide. Adopting M. Schützenberger's formula for carminic acid, the change may be thus represented:—

$$\underset{\text{Carminic Acid.}}{C_9H_8O_5} + \underset{\text{Ammonia.}}{NH_3} = \underset{\text{Water.}}{H_2O} + \underset{\text{Carminamide.}}{C_9H_9NO_4}.$$

This compound is also used for dyeing, but before employing it for this purpose it is necessary to add 4 per cent. of alumina, in the state of jelly, to the mixture described above. The mass is then slowly evaporated to the consistence of a thick paste. By this means all excess of ammonia is expelled. This preparation is used for dyeing silk, and to produce violet and mauve colours on woollen goods.

Carmine Lakes.—These very beautiful pigments are prepared from a decoction of cochineal, and not from carminic acid, the animal matter which the insect contains, appearing to be necessary to their production. The mode of preparing the finest qualities is kept a secret by the manufacturers; but I will describe two processes, which give very satisfactory results. The first consists in boiling one pound of ground cochineal with two gallons of water, to which has been added one ounce of alum. It is then boiled for three minutes, the liquor is allowed to settle, and, after having been kept for several days, about an ounce of a bright carmine lake is produced. For the alum employed in this process cream of tartar can be substituted. The second process consists in boiling for three hours two pounds of powdered cochineal in thirty gallons of water. To this is added three ounces of pure saltpetre. The liquor is then boiled again and left to settle. The clear liquor is run off, and after two or three weeks yields a fine carmine lake.

As these lakes are expensive, they are often adulterated with starch, kaolin, vermilion, etc. The complete solubility of pure carmine lakes in ammonia affords a ready means of detecting these adulterations.

Kermes.—This colouring matter is also derived from a variety of *Coccina*, which lives on the species of oak called *Quercus coccifera*. The young female animal fixes itself under the epidermis of the leaves or young shoots of the oak, in the early part of spring. As the insect grows, it gradually swells out the epidermis, covering the surface of the leaves or branches with a multitude of excrescences. During this period it deposits its eggs.

In Spain and the south of France, during the month of June, or just before the eggs produced would be hatched, the animals are removed and destroyed by placing them in the steam from heated vinegar.

Although this colouring-matter is seldom used in England, it is extensively employed in the south of France, in Spain, Morocco and Turkey, to dye morocco leather, and to dye woollen cloth with that particular shade which characterizes the cap called "fez," worn by the Asiatics.

If the colour is not so brilliant as that of cochineal, it has the advantage of not being changed by soap or dilute alkalies. It is also employed at Milan, Rome and Florence to colour a very favourite beverage known as alkermes. The colour-giving principle of this insect is identical with that of cochineal, and has been used as a dye in the East from time immemorial.

Gum-lac.—This is another variety of the *Coccina*, which lives especially on the *Ficus*, or fig-tree. They reproduce themselves with such rapidity and in such numbers that they entirely cover the surface of the branches of the trees on which they are deposited. Owing to a resinous fluid which they secrete, they form solid masses, which are often a quarter of an inch thick, all round the branches, and adhere very firmly to them. The natives break off these branches just before the hatching season of the animal, and expose them to the sun to kill the insect. These gum-lac twigs are sold under the name of stick-lac. Those of Siam are considered the best, those of Assam next, and those from Bengal the worst.

There are three kinds of lac in commerce—stick-lac, which has just been described, seed-lac and shell-lac. The resinous concretion is taken from the twigs, coarsely powdered, and triturated with water in a mortar. The greater part of the colouring principle is thus dissolved. The granular portion which remains is dried in the sun, and constitutes seed-lac. Shell-lac is obtained by melting seed-lac and straining whilst hot. It is then dropped upon smooth stems of the banyan tree, and so runs into thin plates, which are known in commerce under the name of shell-lac.

These three lacs have the following composition:—

	Stick-lac.	Seed-lac.	Shell-lac.
Resin	68·0	88·5	90·9
Colouring matter	10·0	2·5	·5
Wax	6·0	4·5	4·0
Gluten	5·5	2·0	2·8
Foreign matters	6·5	..	..
Loss	4·0	2·5	1·8
	100·0	100·0	100·0

The colouring matter of the insect is identical with that of cochineal and kermes, and it has been employed as a scarlet dye-stuff in the East from time immemorial.

Lac-lake and *lac-dye* are preparations imported into this country from India since 1796. They are both prepared by acting on stick-lac by a weak alkaline solution, to which is then added a solution of alum. This produces a precipitate, which, when washed and dried, is ready for use. Although both these lakes are prepared with the same substances, lac-dye is considered much superior in quality. This is due to the greater care bestowed on its preparation. The details of the process are kept secret.

To dye woollen cloths with them, they are dissolved in a weak solution of vitriol, to which is added a little oxymuriate of tin, and the cloth dipped in when the liquid is near the boil. It only requires washing and finishing to be ready for market.

Some years ago, Messrs. E. Brooke and Co., of Manchester, introduced a lac-dye much superior to that imported from India, which they prepare by treating stick-lac with weak ammonia, and adding chloride of tin to this solution, when a fine red precipitate is formed, which, collected, is ready for use.

Murexide or Roman Purple.—Although this colour has now been superseded by those derived from coal-tar, I call your attention to it as an example of the assistance rendered by the progress of chemistry to the art of calico-printing.

In 1776, the illustrious Swedish chemist, Scheele, discovered *uric acid* in human urine. In 1817, Brugnatelli found that nitric acid transformed uric acid into a substance which he called *erythric acid*, but which was afterwards named by Wöhler and Liebig *alloxan*. In 1818, Dr. Prout found that this latter substance gave, when in contact with ammonia, a beautiful purple-red colour, which he named *purpurate of ammonia*—the product known by the name of *murexide* since the researches of Liebig and Wöhler in 1857. These discoveries remained dormant in the field of pure science until the year 1851, when Dr. Saac observed that when alloxan came in contact with the hand it tinged it red. From this he inferred that it might be employed to dye woollen fabrics red, and further experiments showed that if woollen cloth, prepared with a salt of tin, were passed through a solution of alloxan, and then submitted to a gentle heat, a most beautiful and delicate pink colour was obtained.

In 1856, MM. Depouilly, Lauth, Meister, Petersen, and A. Schlumberger, applied it as a dyeing material to silk and wool, and succeeded in producing red and purple colours, by mixing the murexide with corrosive sublimate, acetate of soda and acetic acid.

For printing upon cotton, a mixture of murexide with nitrate of lead or acetate of zinc, properly thickened, was printed on the fabric, which was then allowed to dry for a day or two, when the colour was fixed by passing them through a mixture of corrosive sublimate, acetate of soda and acetic acid.

The uric acid required for the preparation of such large quantities of murexide, was obtained from Peruvian guano. The guano was treated with hydrochloric acid and washed. The insoluble mass was then treated with nitric acid of specific gravity 1·40. When the action of the acid was completed, the mass was treated with warm water to dissolve out the alloxan. It was then carefully evaporated to such a degree that it became solid on cooling. The solid mass had a brown or violet colour.

Parliamentary and Law Proceedings.

PROSECUTION OF A CHEMIST FOR MISREPRESENTATION.

At the Leicester Town Hall, on Monday, 20th November, William Lakin was charged with wrongly representing himself as a doctor of medicine.

Mr. Owston for the prosection, Mr. Fowler for the defence.

Mr. Owston pointed out that under the Medical Act it became necessary that any one practising in medicine should be entered in the Medical Register, and the absence of any name from that Register was sufficient ground for supposing that he was not an enrolled member of that Society, and was not entitled to style himself doctor of medicine, and had contravened the Act. He then described defendant's shop, which, he said, contained all the concomitants of an apothecary's shop, and upon the door-plate was "Dr. Lakin." He also pointed out that defendant had issued a certificate, in which he had signed himself "William Lakin, M.D. (U.S.)."

William Dalrymple, manager of the Leicester Provident Dispensary, who said he laid the information in this case. Defendant resided at 16, New Bond Street. Witness had been in the habit, almost daily up to Nov. 13, of passing his house. He had noticed on a brass plate, at the right-hand side of the door, at 16, New Bond Street, "Dr. Lakin." Had noticed in the window three or four bottles containing coloured liquid, castor oil (the bottles having on them the Latin names), syringes, catheters, pamphlets on medical subjects. Through the door he could see into the shop, and in it were the ordinary fittings of a surgeon's shop. Over the window and door was a board, containing "Dr. Lakin, botanic practitioner."

By Mr. Fowler: As an outside observer it did not strike him as the shop of a chemist and druggist, by the entire absence of scents and other drugs. The books on medicine are not usually exhibited in the shop of an ordinary chemist and druggist. In the ordinary druggist's shop the window was made attractive; defendant's was left careless, as is usual in open surgeries. Open surgeries are not customary in Leicester, but are in London and other large towns. Was not aware that Mr. Lakin was registered as a chemist.

Re-examined: Did not usually find a plate at the entrance of a druggist's shop.

Charles H. Marriott said he was M.D. and F.R.C.S. The title of M.D. was conferred by various universities throughout the world. The only universities in England that could grant that degree were Oxford, Cambridge, London and Edinburgh. The degree of doctor was a very ancient one. He believed it extended as far back as 1384.

Cross-examined: There were many universities out of England that could grant that degree.

Elizabeth Blowers, living at No. 4, Noble's Yard, said she had a child of the name of Arthur Blowers. It died on the 9th of October. It was attended by Mr. Lakin. On the day of its death he gave her a paper partly printed and partly written. She took it to Mr. Warburton. Had several bottles of medicine from Mr. Lakin. Paid 8*d.* for each bottle except one, and that she gave him 1*s.* for. He attended the child that time at her own home. She took the child to his house on the other occasions.

William Hobday said he was deputy-registrar of births and deaths for the east district of Leicester. Wood Street was in that district. Received the certificate produced from Elizabeth Blowers.

Mr. Fowler said Mr. Owston had quoted a number of cases which were said to have a bearing upon the point, but he submitted they clearly disproved, or at any rate rebutted the case his friend had attempted to set up. The question they had to decide upon was this; whether defendant had—according the words of the Act of Parliament, the 40th section—wilfully and falsely pretended to be or take or use the name or title of a doctor of medicine, or any name or description that was required by law for a physician. The question was the false pretence,—had the defendant wilfully and falsely pretended to be what he was not. Assuming everything had been proved, he submitted he should be able to prove there was no false pretence. Admitting, for the sake of argument, that the certificate produced was signed by Mr. Lakin, they must look at the whole description, and they would find it was M.D. (U.S.). He should be able to produce to them a diploma, granted by the College at Pennsylvania. He then called the magistrates' attention to the cases of Ellis *v.* Kelly, and Steel *v.* Hamilton, as being proofs that the defendant was justified in the course he had pursued. Mr. Dalrymple's evidence he criticized as something ridiculous. The complainant, he submitted, had failed to present any false pretence, and concluded by reading a diploma granted to the defendant by the "Eclectic Medical College of Pennsylvania" during the year 1870.

Francis William Crick, of Bedford, "eclectic" practitioner, said he was a member of the College of Pennsylvania. That was a college in the United States, having authority to grant diplomas in medicine. Had not been in Pennsylvania. There was a board of examiners in this country communicating with them. He was not on that board. Had had correspondence with Dr. Buchanan, and knew his handwriting. The handwriting on the diploma produced he knew was the handwriting of Dr. Buchanan. They could be examined by a board of examiners in this country without going over to Pennsylvania. Had been himself examined by the board in this country. The result of the examination was transmitted to Pennsylvania. (Cross-examined:) There must be a personal examination. The preliminary branch of education he went through was general English. He went through his preliminary education at Bedford. The board of examiners sent to them questions by post, and they filled them up at home, and transmitted them to Dr. Payne, of Leeds. They were examined at Leeds in surgery, anatomy and obstetrics. Witness was under the tuition of a competent preceptor for over three years. Did not personally know any preceptor. Never saw the doctors before whom he passed his examination in his life. It was not necessary to be three years under the tuition of a medical preceptor, nor was it necessary for them to go before the medical examiners. He was before the board in Leeds in 1867, but did not know who they were. Could not tell the justices one question they asked him, neither in surgery or botany. Could not tell them what he paid for his diploma, but it was a considerable sum. Was sure it was more than £10. (By the Mayor:) It was something between £10 and £100.

Mr. Owston said defendant had put in a diploma which was a fraud.

The Mayor said the action involved rather an important question, not only for Leicester but for other parts of the country, and the magistrates therefore reserved their decision until Friday week.

SUSPECTED POISONING BY ANTIMONY.

At the adjourned inquest held at Birmingham on Tuesday last, to inquire into the death which it was suspected had been caused by antimony, Dr. Hill made his report of the result of an analysis of the contents of the intestines of another child, which the coroner had ordered to be exhumed (see *ante*, p. 397). Dr. Hill deposed that there was sufficient antimony in the intestines of this child also to cause death, and it was shown that its death was accompanied by symptoms similar to those which marked the decease of the sister. The coroner has ordered the exhumation of another child, and the intestines are to be examined by Dr. Hill. Meanwhile the mother is in the hands of the police. One of two children left out of twelve is said to be dying.

MEETINGS FOR THE ENSUING WEEK.

MONDAY Dec. 4.	*Medical Society*, at 9 P.M.
	Society of Arts, at 8 P.M.—"On the Manufacture and Refining of Sugar." By C. Haughton Gill. (Cantor Lecture.)
	London Institution, at 4 P.M.—"Hearing." By Professor Huxley. (Educational Course.)
WEDNESDAY Dec. 6.	*Pharmaceutical Society of Great Britain*, at 8.30 P.M. Evening Meeting.
	Society of Arts, at 8 P.M. "Sewage as a Fertilizer of the Land, and Land as a Purifier of Sewage." By J. Bailey Denton.
THURSDAY Dec. 7.	*Chemical Society*, at 8 P.M. "On Essential Oils." By Dr. J. H. Gladstone.
	Linnean Society, at 8 P.M.
	Royal Society, at 8.30 P.M.

VACANCIES AND APPOINTMENTS IN CONNECTION WITH PHARMACY.

The Editor will be glad to receive early notice of any vacancies of pharmaceutical offices connected with public institutions, and likewise of appointments that are made,—in order that they may be published regularly in the Journal.

APPOINTMENT.

Edward Parker Wolff, Dispenser to Baron Ferdinand de Rothschild's Evelina Hospital, and Registered Student of the Pharmaceutical Society, has been appointed Head Dispenser to St. Thomas's Hospital.

VACANCY.

There is a vacancy for a Dispenser at St. Thomas's Hospital; Candidates must have passed the Minor examination of the Pharmaceutical Society. Salary, £80 per annum. Hours from 9 A.M. till 6 P.M.

BOOK RECEIVED.

THE POCKET FORMULARY AND SYNOPSIS OF THE BRITISH AND FOREIGN PHARMACOPŒIAS, comprising Standard and Approved Formulæ for the Preparations and Compounds employed in Medical Practice. By HENRY BEASLEY. Ninth Edition. London: J. and A. Churchill. 1872.

The following journals have been received:—The 'British Medical Journal,' Nov. 25; the 'Medical Times and Gazette,' Nov. 25; the 'Lancet,' Nov. 25; the 'Medical Press and Circular,' Nov. 29; 'Nature,' Nov. 25; the 'Chemical News,' Nov. 25; 'English Mechanic,' Nov. 24; 'Gardeners' Chronicle,' Nov. 25; the 'Grocer,' Nov. 25; the 'Journal of the Society of Arts,' Nov. 25; 'American Journal of Pharmacy' for November; the 'Canadian Pharmaceutical Journal' for November; 'Journal de Pharmacie et de Chimie' for October; the 'Chloralum Review' for November; 'Brewers' Guardian' for Nov. 6; 'Midland Free Press,' Nov. 25.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Pharmaceutical Aid for Chicago College.

Sir,—Our pharmaceutical brethren in Chicago have lost by the great fire, their College, with its library, lecture-specimens, apparatus, herbarium and furniture. Worse still, many of its founders, and most of its best supporters in Chicago, in short, six wholesale and forty-six retail druggists have lost their businesses and all their property, and, therefore, the means of raising the College from its ashes. Under these circumstances, they beg for aid from fellow-workers. They do not ask us to send help to themselves; for their railroads and lakes, and their indomitable energy and pluck, are still left to them; moreover, the druggists of New York have sent them £350, San Francisco nearly £200, and so on; but they do ask all interested in pharmacy in Great Britain to aid them in reinstating their College. I am sure they will not appeal in vain.

The accompanying letters show the condition into which pharmacy and the pharmacists of Chicago have been thrown by the great conflagration. In a private letter Professor Ebert tells me that the loss in respect of the College is about £2000. There is a partial insurance, but it is in Chicago offices, and therefore, of little value.

In responding to this appeal, I shall be happy to act with a small committee, representing the wholesale and retail druggists of our cities and provinces. Already the President of the Pharmaceutical Society, Alderman Sir Thomas Dakin, lately the Lord Mayor of London, the President of the Pharmaceutical Conference, and Thomas Hyde Hills, Esq., have consented to act on such a committee. Meanwhile, I shall be glad to receive here, at 17, Bloomsbury Square, London, books and specimens or apparatus for lecture-illustration, with contributions wherewith to purchase the same. Cheques and post-office orders may be drawn in my name; the former being crossed "London and Westminster Bank," and the latter made payable at "High Holborn." I will undertake to forward all parcels, and have good grounds for stating that freightage will be reduced and customs' duties remitted.

The first list of contributors and subscribers will be published next week. Yours faithfully,

John Attfield.

"Chicago College of Pharmacy.

"*To* Professor Attfield,
"*London, England.*

"*Chicago, October* 31*st*, 1871.

"My dear Sir,—The interest you have always shown in our College leads me to lay before you a statement of the loss we have sustained, thinking that in your extensive intercourse with British pharmacists you might be able to secure aid for us in replacing the College in its former position of usefulness.

"We would not make this application but for the fact that nearly all our active members have lost, like the College, all they possessed. In this really lies our weakness, as, otherwise, we could easily build it up again. All our library, cabinets of specimens, herbarium, apparatus and implements for instruction, book-cases, furniture, and many other articles of value, collected by years of effort, with the entire stock of the *Pharmacist*, are gone. The College of late was more prosperous than ever, and its influence was becoming a power for good in the elevation of Western pharmacy. Under such circumstances, we feel that others interested in the promotion of the progress of pharmacy may be induced to assist us in reviving the College, and would ask you to represent us wherever you find those who are interested in our endeavours. We do not lack willing hands nor strong hearts to do the work set before us, and with the assistance and sympathy of our friends, we trust the future of our beloved College may be far better than its past.

"Thanking you for your interest in our welfare, we
"Remain yours respectfully,
"Albert E. Ebert,
"*Corr. Secy. Chicago College of Pharmacy,*
"*Corner of State and* 12*th Streets, Chicago,*
"*U. S. A.*"

The Chicago Catastrophe.

Sir,—So many inquiries have reached me during the past week or two concerning pharmacists in Chicago, and the extent of the losses they have sustained in the late fearful conflagration, that I have thought I might send you the accompanying letter from Professor Ebert, believing that, although not written with any view to publication, it can hardly fail to interest your readers.

The appeal it contains on behalf of the College of Pharmacy can scarcely pass unheeded by English pharmacists. There can be little doubt that our publishers and publishing societies, if rightly approached, would willingly aid in the undertaking; there may be many duplicate or little used pharmaceutical books in the libraries of your readers which would be cheerfully presented to make good the loss; and in other ways your readers will, doubtless, readily contribute.

When in Chicago, in September, I visited the rooms occupied by the College, and found very efficient arrangements for educational purposes, evening meetings, and the like, though necessarily, in a young institution, on a somewhat small scale; too small, I should suppose, for the number of students who appear to have entered at the beginning of the present ill-fated session.

I am, yours very truly,
Henry B. Brady.

Newcastle-on-Tyne, Nov. 18*th*, 1871.

P.S. In the letter appended I have eliminated a few sentences of purely personal character.

"*To* Henry B. Brady, F.L.S.,
"*Newcastle on-Tyne.*

"*Chicago, Nov.* 3*rd*, 1871.

"My dear Friend,—Your most welcome and sympathetic letter has just come to hand, and was opened by our mutual and unfortunate friend Sargent, who is making (like many others of our colleagues whom the "fire fiend" did not spare) my store his headquarters until his (which is being located on the corner of Wabash and 16th Streets) is finished. Mr. Sargent and myself were much pleased to hear from you, and of your safe arrival on the shores of *generous old England*, whom Chicago will hereafter only remember as a distant friend, extending to us the liberal assistance now pouring in at this hour of distress. We all thank her, and shall never forget this friendship of humanity when our troubles are over, and our ship again sails in calm water. I am safe as far as my personal safety and that of my business is concerned, but I may yet become a heavy loser should the insurance companies do no better than they appear to promise at present. The conflagration was fearful, and no pen has yet written an account that has done justice to the ravages of this terrible fire. Our colleagues who suffered (and they number from 40 to 50), like the balance of the populace, saved *really nothing*. All was consumed, there being no time left to attend to anything but personal safety. Among those you met at Mr. Buck's house only two escaped, Mr. Ehrman and myself. Messrs. Buck and Rayner lost both stores; they have again opened on the corner of State and 16th Streets; Mr. Whitfield has opened on the cor. of State and 18th Streets, Mr. Sargent on the cor. of Wabash and 16th, Mr. Parson on the cor. of Wabash and 14th, Bliss and Sharp have removed to their store cor. Wabash and 22nd. The College and its contents were burned the first night. We have *lost all*, with the whole stock of the *Pharmacist*. I have written a letter to our mutual friend Attfield, from whom I had a pleasant and sympathetic letter the day before yesterday, in which I enclose a personal appeal for the Chicago College in the way of contributions of specimens, books, etc. These we cannot purchase even if we had the money, which we do not ask. I know you will plead for our cause, and therefore thank you beforehand. The fire was checked on the corner of Harrison Street, in close vicinity of Ehrman's store. Just imagine for one moment the whole of the south division, from Ehrman's store north, and the whole of the north division as far as we drove that Saturday afternoon in September, *all gone*, excepting one solitary house. Nothing is left of those fine buildings which I was so proud in pointing out to you during our drive and our various rambles while you were here. I have so many friends who were rich and are to-day poor,—nothing left them but their good names and credit (which is something) to start again in life. But many are far advanced in life, and it seems so hard that they again must commence at the foot of the ladder.

Take Mr. —— as an example, one who has struggled bravely, and had just accomplished a long-desired object in getting the whole of the business into his own hands, to be swept away in one night, so that not one cent is left him, but, on the other hand, an embarrassment of about 8000 dollars debt. He was insured for 24,000 dollars, out of which he will realize about 5000 to 6000 dollars. Still he holds out bravely, and is putting up a temporary building on his new location. Bartlett lost nothing, excepting what he had at the College. Your friend, the writer, lost all his apparatus, instruments, books, specimens, and many highly cherished articles which he had been collecting for years, and had taken to the College for use in the just-commenced course of lectures. We had every prospect of a very successful session, having on the opening night some 43 matriculants, and with the expectation of at least a class of 50 students. After the fire, for a week or so, we hoped that we might continue the course, and had made arrangements with the Chicago Medical College for the use of their specimens, apparatus and rooms, but we were doomed to disappointment by the severe illness of Prof. Hambright, which resulted indirectly through the excitement of the fire. He was left very low and prostrated, and his physician ordered him to be removed from the city. This has put a stop to our proceedings for the present, still hoping, however, that, with the aid of our friends, we shall be well prepared to continue next winter. We have had much assistance sent us, 800 dollars from San Francisco, 17,000 dollars from New York city. Still, there is considerable want even of the necessities of life among those who have never been accustomed to asking relief. These are really the greatest sufferers, and it becomes our duty to seek them out, and save them, if possible, from actual want. My own business is good, and am kept quite busy, so that I can find but a few moments to spare at a time to attend to correspondence. The *Pharmacist* we shall have out, if possible, about the 25th of this month. We will have it published in Philadelphia if by that time we cannot find any printer in this city ready to do it. I am busy getting matter ready.... Remember me kindly to all inquiring friends, and believe me, as ever,

"Your friend,

"Albert C. Ebert."

Dispensing Difficulties.

Sir,—I quite agree with "T. B." and also with Mr. Clark as to the inadvisability of making such material alterations in prescriptions as carried out by Mr. Wilkinson, merely for the sake of presenting the medicine in a convenient form for administration. Suppose, for instance, the patient should the next time the medicine was required send the prescription elsewhere; the result would be a great deal of vexation and annoyance to either one chemist or the other, caused by the patient's dissatisfaction with the variable effect of the medicine.

My plan is, whenever a soft extract is ordered, such as rhei, calumb. or gentian, to weigh out the required quantity, transfer it to a slab, and then apply a gentle heat with the gas stove until I think the extract has acquired a proper consistence for working. By adopting this means I have generally been able to turn out a satisfactory pill, and I think in every respect complied with the wishes of the prescriber.

For the second prescription given by Mr. W. in the current number of the Journal, I should use the pulv. ext. coloc. co., allowing, of course, a percentage for the loss of moisture.

Hackney, Nov. 27th, 1871. F. W. S.

Sir,—I am to some extent responsible for the reflections cast on my unhappy city by one or two of your correspondents, as I omitted to report some remarks made by myself and others when Mr. Wilkinson's paper was read. The substitution of hard extract for the ordinary soft form was recommended in the "difficult" formulæ mentioned.

I do not remember, however, that there was any remarkable outburst of indignation when Mr. Wilkinson spoke of reducing the quantity of oil of cinnamon in one case; perhaps some of us failed to distinguish the moral difference between putting the quantity only that could be absorbed by the pill-mass, and adding the full quantity and then squeezing part of it out on the pill machine and fingers, or driving it off by the aid of a warm mortar or slab. Let him that is without sin amongst us (if sin it be) cast the next stone.

We who know Mr. Wilkinson best knew that he was too intelligent and conscientious a man not to communicate with the prescriber when practicable or necessary.

F. Baden Benger,

Hon. Sec. Manchester Chemists' Association.

Manchester, Nov. 28th, 1871.

Sir,—In reply to Mr. Wilkinson's request, that I would prove my assertion that the material alterations he proposes are unnecessary in the cases given, I would submit that if the extracts are, as the Pharmacopœia directs, "evaporated until of suitable consistence for forming pills," there will be no difficulty; but if they are not in a condition fulfilling the above requirement, it is surely better to take the trifling trouble of further evaporation than to adulterate.

A more excellent way of making the iron, etc. pills than the certainly handy one of throwing out anything troublesome, is to subtract five grains of water from the sulphate of iron, and add that quantity of wax to the oil of cinnamon. By this means the whole of the component medicines are combined in a perfectly manageable mass without increase of weight. T. B.

Stockton, 28th Nov., 1871.

Sir,—I see in the Journal of last week that Mr. Wilkinson, in speaking of prescriptions which, if dispensed accurately as prescribed, cannot be formed into pills at all, gives the following as an example, stating that it forms a mass the consistence of treacle:—

℞. Podophylli,
Scammon., ana gr. xij
Ext. Rhei gr. xlviij
Ol. Cinnamon ♏xxiv.
Ft. pil. xxiv.

I find it may be easily formed into firm and tolerably hard pills by using the powdered extract of rhubarb (of course allowing for loss of moisture), and adding to each pill a grain of calcined magnesia and powdered tragacanth, so forming a 5-grain pill. The oil of cinnamon should be dropped upon the whole of the magnesia, made into a mass and divided as quickly as possible, putting the pills into a bottle.

This, I think, is following the suggestion of your correspondent "T. B.," presenting the medicine in such a form as to be taken without inconvenience, and at the same time avoiding making any material alteration in the prescription with the physician's approval.

I enclose some of the pills made in the manner described.

Birmingham, Nov. 28th, 1871. James Spencer.

[*⁎* The pills forwarded by our correspondent appear to be of convenient size, well made and of good consistence.—Ed. Pharm. Journal.]

Prescribing and Dispensing.—Mr. George Mee writes in reference to the article published last week under this title, for the purpose of defending London physicians, and of describing his own experience of the caligraphy, chemistry and posology of their prescriptions. But he is quite mistaken in supposing our remarks to have been applied specially to London physicians.

G. Jenkins.—See the second page of the advertising sheet.

"*Logwood.*"—The preparation is made by Messrs. Savory and Moore.

G. M. Wilkins.—We do not know of any published process. Apply to Mr. Robbins, Oxford Street.

Sydney March.—We know of none.

G. J. A.—It is probable that the free acid decomposes the citrate.

J. P.—After having been in the trade fourteen years, and having passed the Modified examination two years ago, it ought to be unnecessary for you to study in order to pass any examination as to competence as a pharmacist. We do not find your name on the Register, or amongst those who have passed the Modified examination.

T. W.—We have examined the Regulations, and think that you have just cause of complaint.

J. B. B.—A few grains of bicarbonate of soda added to good fresh milk will preserve it for some days.

"*Spes.*"—Probably "Plummer's Pill," but it is difficult to pronounce decidedly in the absence of the prescription.

Communications, Letters, etc., have been received from Mr. G. Wilcox, Dr. De Vry, Mr. G. C. Druce, Mr. W. W. Stoddart, Mr. H. Kingscote, B. S., "Zeno," "A Founder," "Puzzled."

THE SUBSTITUTION OF PROPORTIONAL OR RELATIONAL NUMBERS FOR SPECIFIED WEIGHTS AND MEASURES IN THE DESCRIPTION OF PROCESSES IN THE PHARMACOPŒIA.*

BY PROFESSOR REDWOOD.

One of the questions that will necessarily arise in connection with the preparation of a new edition of our Pharmacopœia, is that of the weights and measures to be authorized or recommended for use in prescribing, dispensing and compounding medicines. The committee by whom the present edition of the British Pharmacopœia was prepared have alluded, in the preface to that work, to two "grave defects" in the system of weights principally employed in the description of pharmacopœia processes, namely, "the absence of any denomination of weight between the grain and the avoirdupois ounce of 437·5 grains, and the fact that the ounce is not a simple multiple of the grain;" and they have given, and to some extent used, a second or alternative system,—the metrical system, in which those, or similar, defects do not exist. This more perfect system having been thus approved, and having been adopted in most Continental countries and in this country for the purposes of science; moreover, the substitution of this system for British weights and measures being now sanctioned by law, and a knowledge of it being included among the qualifications which pharmaceutical chemists are expected to possess,—it becomes important to consider whether we cannot adopt an arrangement in the Pharmacopœia by which the employment of metrical weights and measures would be facilitated and promoted. Instructions for the use of these weights and measures in volumetric testing are given in the present edition of the Pharmacopœia, but with this exception, the British system is used, and the processes are so constructed that the application of the other system, in many instances, involves a good deal of calculation.

Yet, notwithstanding the fact, as thus shown, that there are defects in our system of weights, especially as applied to pharmacy, and some strong grounds for exchanging this system for another, I do not think the time has arrived at which it would be judicious or safe, in the administration of medicine, entirely to replace British weights and measures by those of the metrical system. Such a change, if it were now suddenly made, would be distasteful and embarrassing to a large proportion of those for whose use the Pharmacopœia is intended; and this, I believe, applies quite as much to medical as to pharmaceutical practitioners. There are, however, many physicians and pharmacists who are favourable to, and prepared for, the change, and by whom an arrangement of the Pharmacopœia that should afford easy means for effecting the transition from one system to the other, would be looked upon as a step in the right direction.

Assuming, therefore, that this change is desirable, and indeed inevitable, but that it ought to be brought about gradually, we may profitably consider what are the means best suited for accomplishing such an object.

There are two ways in which a gradual change might be introduced. One is to attach to each of the formulæ of the Pharmacopœia, as now constructed, a separate column of figures, representing the equivalent weights and measures according to the metrical system, leaving it to the operator to adopt whichever system he may prefer; and the other is to substitute proportional or relational numbers for specified weights and measures, such numbers being equally applicable to either system.

There are some difficulties in the way of carrying out either of these methods. If we adopted the first, it would be found that in representing the equivalents of our system in terms of the other, it would be necessary to use such a multiplicity of figures as would prove cumbrous and inconvenient in their practical application. Moreover, to be consistent, the same method of giving the equivalents in terms of the alternative system ought to be extended to every part of a process in which weights or measures are expressed, including the application of tests; and this, if fully carried out, would greatly add to the length and intricacy of the descriptions of our processes, and tend to render them obscure. These objections appear to present insuperable obstacles to the adoption of this as a general method of describing the processes, although there are a few instances in which it might be used with advantage.

With reference to the second method, the principal difficulty in the way of its being applied arises from the defect, already alluded to, in our system of weights, namely, that the ounce is not a simple multiple of the grain; for as the quantities represented in several of our processes, as they now stand, are expressed partly in grains and partly in ounces, it is sometimes impossible to give the proportions of the ingredients in whole numbers. There is also another difficulty, if liquids are to be measured volumetrically, and solid and liquid ingredients are used in the same process, arising from the necessity of referring to two different standards, one for the solids and the other for the liquids; for not only would this entail the use of different words to indicate the signification of the numbers when so applied, but in many cases the numbers would not represent the proportional relation of the parts. These difficulties, however, might be met, and in a great measure obviated, by altering the proportions of the ingredients used in some of the processes, attaching to the numbers short affixes which should define their meaning, modifying the mode of arranging or constructing some of the formulæ, and omitting the application of the method in a few instances.

I have been for some time endeavouring to apply this as a general method to be used in describing processes in the Pharmacopœia; and my object on the present occasion is to explain the way in which I think it might be made to accomplish the desired object; I wish also to elicit the opinions of practical pharmacists and others with reference to it.

The first thing required is a definition of terms to be employed in connection with the numbers representing relative quantities, for as these numbers would sometimes represent weight and sometimes volume, it would be necessary to distinguish one from the other. The term *part* might be used to represent *weight*, and the term *measure* to represent *volume*. These terms are commonly employed with such significations, and if it was clearly defined that *parts*, when used in connection with the proportional or

* Read at the Evening Meeting of the Pharmaceutical Society of Great Britain, Dec. 6, 1871.

relational numbers, always meant parts by weight, and that *measures*, when similarly used, always meant parts by volume, no mistake would be likely to occur. If, however, it should be thought desirable in some instances to be more explicit, the term *part* might be extended to *part by weight;* but it would be very undesirable to use more words than are absolutely necessary, as these terms would have to be frequently employed, not only in setting out the formulæ for the ingredients, but in the instructions for conducting the processes, and also in describing the application of tests. In cases in which the terms *part* and *measure* would both occur in the same process, the *measure* would be the water-measure of the unit of weight, whatever that might be.

With a clear understanding of the meaning of the terms *part* and *measure*, as thus defined, their application in the construction of formulæ would, in most cases, be sufficiently simple and easy, and the interpretation of the descriptions given by means of them would admit of no doubt.

The following examples will serve to illustrate the application of the proposed method to some of the processes of the Pharmacopœia:—

Antimonial Powder.

Take of

Oxide of Antimony	1 part.
Phosphate of lime	2 parts.

Mix them thoroughly.

Diluted Acetic Acid.

Take of

Acetic Acid	1 measure.
Distilled Water	7 measures.

Mix.

These are two of the most simple cases that would occur; the numbers used representing the proportions of the ingredients, in one case by weight, and in the other by volume.

As another example, we may refer to the process for *spirit of camphor*, in which an ounce of camphor is dissolved in nine fluid ounces of rectified spirit. The formula would be written:—

Take of

Camphor	1 part.
Rectified Spirit	9 measures.

Dissolve.

In this case, whatever weight might be used to represent 1 part, the 9 measures would be nine water-measures of that weight. It is obvious, however, that the numbers here are not strictly proportional numbers, for the spirit and camphor do not bear the relation of 9 to 1 either by weight or volume. The numbers might be more correctly represented as relational numbers. They indicate the relation of a weighed quantity to a measured quantity. Even the terms part and measure, as used in this case, might be taken exception to, if considered apart from the definition already given. Viewed in that way, without reference to the definition, the terms would be more explicit, if for measures was written unit-measures, the measure being a measure of the unit of weight; but even this, without further explanation or definition, would not convey a correct impression, for the spirit, if estimated as spirit, is not 9 measures of the unit of weight, but 9 water-measures or nine times the measure of the unit-weight of water.

It thus appears, therefore, that the terms *part* and *measure*, or, I believe, any other equally and sufficiently concise terms, must be used conventionally, for the specific purpose required, and subject to a definition. When so used, the terms are convenient and appear to answer the required purpose. They are applicable to either of the alternative systems of weight and measure, for while we have the grain and grain-measure, the ounce and fluid ounce or ounce measure, and the pound and sixteen-ounce measure, all of which are recognized and have long been used in this country,—the metrical system includes the cubic centimetre and the litre, which are the water-measures of the gram and the kilogram.

In some of the processes that are more complicated than those I have referred to, difficulties in the way of applying the proposed method appear to exist, which, however, are easily removed by slightly modifying the arrangement of the formulæ. The process for chloroform, as given in the Pharmacopœia, is one of this description. The formula, as it now stands, includes not only the ingredients employed for the production of the crude chloroform, but also those used in the subsequent purification of the product. The description would be rendered more simple and effective, and, at the same time, better suited for the use of proportional and relational numbers, if the formula representing the ingredients contained only those used in the first operation, and the substances used in the purification were merely named when referred to in the instructions for conducting the subsequent part of the process; it would then run as follows:—

Take of

Rectified Spirit	2 measures.
Water	30 measures.
Chlorinated Lime	10 parts.
Slaked Lime	5 parts.

Put the water and the spirit into a still capable of holding three or four times as much as the bulk of the ingredients introduced, and having raised the temperature of the mixed liquid to 100°, add the chlorinated lime and slaked lime, and mix the whole thoroughly. Connect the still with an efficient condenser, terminating in a narrow-necked receiver, and apply heat so as to cause distillation to commence, taking care to withdraw the fire as soon as the process has been well established. When the distilled product amounts to 3 or 4 measures the receiver is to be withdrawn, and its contents mixed with about 5 measures of water in a bottle of ample size in which they can be well shaken together. The mixture is now to be left at rest for a few minutes, when the liquids will separate into two strata of different densities. Let the lower stratum, which constitutes crude chloroform, be washed by agitating it in a bottle with a tenth of its volume of distilled water. Allow the chloroform to subside, withdraw the water, and repeat the washing twice in the same way with similar portions of distilled water. Add to the washed chloroform an equal volume of sulphuric acid, care being taken that the acid thus used is entirely free from nitric or nitrous acid; shake them together in a stoppered bottle for five minutes, then allow the mixture to settle, and transfer the upper stratum, consisting of purified chloroform, to a flask or retort, with about one-twentieth of its weight of dry chloride of calcium and a fourth of that quantity of perfectly dry slaked lime. Let them stand together for about an hour, then, an efficient condenser being attached, distil over the pure chloroform by means of a water-bath. Preserve the product in a cool place in a bottle furnished with an accurately-ground stopper.

The process for ether would be treated similarly, and would be described as follows:—

Take of
Rectified Spirit . . . . . 12 measures.
Sulphuric Acid . . . . . 10 measures.

Mix the acid and spirit together in a glass matrass capable of containing at least twice as much as the bulk of the ingredients introduced, and, not allowing the mixture to cool, connect the matrass by means of a bent glass tube with a Liebig's condenser, and distil with a heat sufficient to maintain the liquid in brisk ebullition. As soon as the ethereal fluid begins to pass over, supply fresh spirit through a tube into the matrass in a continuous stream, and in such quantity as to equal the volume of the fluid that distils over. For this purpose use a tube furnished with a stopcock to regulate the supply, connecting one end of the tube with a vessel containing the spirit raised above the level of the matrass, and passing the other end through a cork fitted into the matrass. When about 42 measures of liquid have distilled over, the process may be stopped. For the purification of this crude ether, mix it with a third of its volume of saturated solution of chloride of calcium and a little slaked lime (about a fourth part of the weight of the chloride of calcium solution), and, having shaken them together in a bottle, leave them at rest for ten minutes, then pour off the light supernatant fluid, and distil it with a gentle heat until a glass bead of specific gravity of 0·735 placed in the receiver begins to float. The ether and spirit retained by the chloride of calcium and by the residue of each rectification may be recovered by distillation, and used in a subsequent operation.

Among processes the descriptions of which would require to be modified much in the same way as the two last noticed are those for the preparation of the alkaloids. These are the most complicated processes we have, and if the use of proportional and relational numbers can be made available in describing them, we may conclude that the method would not fail on account of the complicated nature of the instructions to be given. The process for *digitalin* may be taken as a test of the applicability of the method in such cases. It would be given as follows:—

Take of

Digitalis Leaf, in coarse powder	Of each a sufficiency.
Rectified Spirit	
Distilled Water	
Diluted Acetic Acid	
Purified Animal Charcoal	
Solution of Ammonia	
Tannic Acid	
Oxide of Lead, in fine powder	
Pure Ether	

Digest 100 parts of the digitalis with 400 measures of the spirit for 24 hours at a temperature of 120°, then put them into a percolator, and when the tincture has ceased to drop pour 400 measures of the spirit over the contents of the percolator, and allow it to slowly percolate through. Distil off the greater part of the spirit from the tincture, and evaporate the remainder over a water-bath to the consistence of a soft extract. Mix this extract with 12 measures of diluted acetic acid, and digest the solution thus formed with 1 part of purified animal charcoal; then filter, and dilute the filtrate with distilled water until it amounts to 50 measures. Add solution of ammonia nearly to neutralization, and afterwards add 1 part of tannic acid dissolved in distilled water. Wash the precipitate that will be formed with a little distilled water; mix it with a small quantity of the spirit and 1 part of the oxide of lead, rubbing them together in a mortar. Put the mixture into a flask, and add to it 10 measures of the spirit. Raise the temperature to 160°, and keep it at this heat for about an hour. Then add 1 part of purified animal charcoal. Put it on a filter, and from the filtrate carefully drive off the spirit by the heat of a water-bath. Lastly, wash the residue repeatedly with pure ether, and dry it.

If, with reference to cases such as this, it should be said that the instructions would be more easily followed in carrying out the processes if the quantities referred to were represented by specified weights and measures, the objection might be admitted without material detriment to the value of the proposed method; for these processes, the only ones in which such complicated instructions occur, are not given with a view to their being carried out by pharmacists in general, nor should they be undertaken by any but those accustomed to such operations, and to whom the modified instructions would supply all the information required.

Thus far, and in cases similar to those I have noticed, which constitute a great majority of the Pharmacopœia processes, the application of the proposed method would not be attended with any difficulties that could not be overcome by such slight modifications as I have indicated; and in some of these and other cases it would, I think, facilitate improvement of the processes by causing a more uniform relation and more simple proportions to be established than now exist among the ingredients of compound medicines.

But I must now refer to cases in which more serious difficulties are presented. There are a considerable number of processes in the Pharmacopœia in which the ingredients do not bear a simple numerical relation to each other, and several of these, containing powerful medicines, are very important remedies. Thus, we have *liquor arsenicalis, liquor arsenici hydrochloricus, liquor atropiæ, liquor atropiæ sulphatis, liquor morphiæ acetatis, liquor morphiæ hydrochloratis, liquor sodæ arseniatis,* and *liquor strychniæ,* all containing 4 grains of the active ingredient in a fluid ounce of the solution, or 1 part in 109·375 measures. Now, in these cases and others of a similar description, as the proposed method is not applicable to the existing processes, it would be necessary to make the processes applicable to the method by altering the proportions of the ingredients. In the event of such an alteration being made in the medicines named, it would probably be considered desirable to make them all contain 1 per cent. of the active ingredient. But a proposition to that effect, although much might be said in its favour,—and I should be disposed to advocate it,—would nevertheless raise some questions which ought not to be overlooked. The existing proportions have evidently been adopted to suit our system of weights and measures. Four grains in the fluid ounce, or half a grain in the fluid drachm, are convenient proportions suited to the particular circumstances under which we have been accustomed to prepare, dispense and administer the medicines. The proportions have been made to suit our compounding and dispensing appliances. If the proportions were altered to 1 in 100, we should simplify the numerical relation of the ingredients, but not the proportion of the active ingredients to the measures commonly used for dispensing and administering medicines, for a 1 per cent. solution would contain 4·375 grains in a fluid ounce, or 0·5468 grain in a fluid drachm.

If this method were adopted in preparing the solutions referred to, and other preparations that would come into the same category with them, it would be necessary to provide measures of ample size graduated to grain-measures instead of fluid ounces. Such measures are now supplied by dealers in chemical apparatus, but they are not in common use. Sets of grain-weights up to 10,000 grains would also be desirable. The ease and rapidity with which processes would be performed in which proportional and relational numbers are used would greatly depend upon using the same denomination of weight or measure throughout a process, and where measure as well as weight is indicated in the same process, using a denomination of measure that corresponds to the unit of weight, as for instance, using the grain-measure in connection with the grain, and the cubic centimetre in connection with the gram.

One of the objects contemplated in the proposed change being the establishment of a more simple quantitative relation of the ingredients in compound medicines, it would, I think, be desirable in some cases to depart from the usual practice of measuring liquids. I would suggest, therefore, that in medicines containing solid and liquid ingredients, if the products be of such consistence that they would be prescribed and dispensed by weight, the liquid ingredients contained in them should be apportioned by weight, with the view of simplifying the proportions. Thus, for instance, in confection of opium, as now prepared, neither the opium nor the compound powder of opium is a simple proportion of the whole, because the syrup is used by measure; whereas if the syrup as well as the powder were ordered by weight, the proportions could easily be made simple and definite. The formula now is,

Compound powder of opium	192 grains.
Syrup	1 fluid ounce.

Proportion 1 in 4, nearly.
I would make it,

Compound powder of opium	1 part.
Syrup	3 parts by weight.

Proportion of compound powder of opium 1 in 4, and of opium 1 in 40, exactly.

This is a case in which it would be desirable to extend the term "parts" to "parts by weight," as applied to the syrup, with a view to greater explicitness.

Confection of scammony would be treated similarly, and so also would the pill-masses which contain liquid excipients or essential oils. By adopting this and other proposed changes, we might obviate the necessity there now is of using the term "nearly" in representing the proportions of the ingredients in compound medicines.

I have already alluded, among the modifications required to make the proposed method practically applicable to all the processes of the Pharmacopœia, to the omission in a few instances of the use of proportional or relational numbers. It will be obvious that in cases in which the formulæ are intended to represent the quantities of the medicines ordered which are to be administered at one time, as occurs in the formulæ for *enemata*, reference must be made to specified weights and measures. In such cases, of which there are only a few in the Pharmacopœia, one of two methods must be adopted. We must either express the quantities of the ingredients by weight and measure, putting the two sorts of weight and measure in separate columns,—a method I have already alluded to,—or we may first describe the process by using proportional or relational numbers, and then represent the doses by weight or measure, according to the alternative systems.

In the formulæ for *enemas* I think the former of these methods the best, because each of the formulæ is in fact a prescription, which is inserted in the Pharmacopœia to save the physician trouble. The only change I would propose to make in these formulæ would be the introduction of a second column of figures representing the quantities according to the metrical system; thus,

Enema of Aloes.

Aloes	40 grains.	or	2·59 gram.
Carbonate of potash	15 grains.		0·97 gram.
Mucilage of starch	10 fl. ounces		283·49 cubic centimetres.

The occasional placing in apposition of the equivalents of the two sorts of weight and measure, in this way, would have the good effect of showing the relation existing between them.

There are two other classes of preparations in the Pharmacopœia, in which the processes include the apportionment of the doses, namely, the *suppositories*, and the *lozenges*. I would treat these cases differently from that of the *enemas*.

With reference to the suppositories, the formulæ for all of which are very simple, it would only be necessary to substitute parts for grains in connection with the ingredients, and in representing the weight of each suppository to give it in grams as well as grains:—

Tannic Acid Suppositories.

Take of

Tannic Acid	36 parts.
Benzoated Lard	44 parts.
White Wax	10 parts.
Oil of Theobroma	90 parts.

Melt the wax and oil of theobroma with a gentle heat, then add the tannic acid and benzoated lard, previously rubbed together in a mortar, and mix all the ingredients thoroughly. Pour the mixture while it is fluid into suitable moulds to form suppositories, each of which shall weigh about 15·4 grains, or 1 gram.

In the formulæ for lozenges more considerable alteration would be necessary, but in making such alteration the processes might be simplified, as far as the descriptions are concerned, and the proportions among the ingredients made definite. One instance will illustrate the whole:—

Reduced Iron Lozenges.

Take of

Reduced Iron	10 parts.
Refined Sugar, in powder	250 parts.
Gum Acacia, in powder	15 parts.
Mucilage of Gum Acacia	30 parts.
Distilled Water	a sufficiency.

Mix the iron, sugar and gum, and add the mucilage and water to form a proper mass. Divide into lozenges, each of which shall contain 1 grain, or 6·4 centigrams, of reduced iron. Dry them in a hot-air chamber with a moderate heat.

The only remaining part of the processes and descriptions in the Pharmacopœia that I have to refer to is that which relates to the applications of tests. There is no difficulty here in the employment of proportional and relational numbers, provided the rule be adhered to of always using the same denomination of weight or measure throughout a process; and when measure as well as weight is indicated in the same process, of using a measure that corresponds with the unit of weight. The quantities used in testing are always such as easily admit of the application of this rule, and, in other respects, only a few slight alterations are generally required. The following examples will serve to illustrate the mode of treating cases of this sort.

Vinegar.

Characters and Tests.—A liquid of a brown colour and peculiar odour, specific gravity 1·017 to 1·019. 500 measures of it require at least 451 measures of the volumetric solution of soda, corresponding to 5·4 per cent. of acetic acid ($HC_2H_3O_2$). If mixed with $\frac{1}{45}$ by measure of solution of chloride of barium, and the precipitate, if any, separated by filtration, a further addition of the test will give no precipitate. Sulphuretted hydrogen causes no change of colour. One fluid ounce or 28·349 cubic centimetres, contain 24 grains, or 1·55 grams, of acetic acid ($HC_2H_3O_2$).

Hydrochloric Solution of Arsenic.

Characters and Tests.—A colourless liquid, having an acid reaction. Specific gravity 1·009. Sulphuretted hydrogen gives at once a bright yellow precipitate. 400 measures of it boiled for five minutes with 20 parts of bicarbonate of soda, and then diluted with 2000 measures of distilled water, to which a little mucilage of starch has been added, does not give with the volumetric solution of iodine a permanent blue colour until 808 measures have been added, corresponding to 1 part of arsenious acid in 100 measures of the solution.

One fluid ounce, or 28·349 cubic centimetres, corresponds to 4·375 grains, or 0·283 gram, of arsenious acid.

In this case I have assumed that the process has been so altered as to yield a 1 per cent. solution.

I think I have now referred to the various conditions under which the substitution of proportional or relational numbers for specified weights and measures might be effected. I submit the proposition to the judgment of those members of the medical and pharmaceutical bodies who are anxious to make the British Pharmacopœia a credit to this nation, and available for use in all other countries.

[*The discussion upon this paper is reported at p.* 476.]

A METHOD FOR THE ESTIMATION OF MORPHIA IN OPIUM.*

BY JOHN T. MILLER.

The narcotic power of opium is mainly owing to morphia, the proportion of which in different specimens is subject to great variation. As the appearance of the drug affords no clue to its strength, the pharmaceutist can solve that problem only by the employment of chemical means. A morphiometric method at once "ready, easy, accurate and precise," is still, I believe, as it was when Pereira wrote, a desideratum.

The process given in the British Pharmacopœia is, perhaps, as good as any of the kind, yet it is tedious, and, judging from my own experience, uncertain. Not being satisfied with it, I resolved to try whether a method of moderate accuracy and readiness could be based on the reduction of *iodic acid* by morphia. The scheme did not seem very promising, for that acid is decomposed by many organic bodies besides morphia; but as their action is, for the most part, much slower than that of the alkaloid, I thought it might be possible (supposing such bodies to be present) to separate with sufficient sharpness, their effect from that due to the morphia. It will be seen presently, however, that the chief difficulty met with was not of the kind anticipated.

With a weighed quantity of the sample to be tested, a solution was prepared as free as possible from resinous, mucilaginous and colouring matters; but it was not considered necessary to remove any of the opium principles, as they do not, with the exception of morphia, decompose iodic acid. To a certain volume of this solution some aqueous iodic acid was added, and after the lapse of a few minutes the liberated iodine was washed out by shaking the mixture with carbon disulphide. The *sample colour* thus produced was then compared with another—the *standard colour*—prepared in the same manner, but from a solution of morphia of known strength; and their intensity was equalized by adding carbon disulphide to the deeper. From the data thus obtained the percentage of morphia in the sample was calculated.

When a number of specimens had been thus examined, they were next tested by the B. P. process. The results obtained were higher—sometimes considerably higher—than those yielded by the former method. However, as the precipitates were not pure, each was washed with half a fluid ounce of cold chloroform, dried and reweighed. All had lost more or less in weight; but very little of the matter dissolved out could be morphia, as a fluid ounce of chloroform takes up only about 0·1 grain of that substance. A portion of each washed precipitate was next accurately weighed off and made into a solution similar to the standard, with which it was carefully compared in reducing power, and the amount of real morphia in the precipitate thereby determined. The accordance of the two series of figures was now much closer than before; but a suspicion arose that some of the reduction results were too low, and soon reached certainty. To clear up this point numerous experiments were tried, only a few of which need be mentioned:—

1. Some *narcotine* was added to the standard morphia solution, then iodic acid, and after the mixture had stood a few minutes, it was shaken with carbon disulphide. The feeble colour of the latter showed plainly that it contained less than the usual quantity of iodine.

2. The experiment was repeated, but with this difference, viz. the shaking with carbon disulphide was performed immediately after adding the iodic acid. The full colour was now obtained, the liberated iodine having been seized by the disulphide before the secondary reaction could take place.

3. Similar experiments were tried with *codeine*, the invariable result being a diminution in the amount of iodine set free.

4. *Thebaine* was found to act in the same direction as codeine.

5. Iodine water, when added to a slightly acid solution of *papaverine*, produces a red-brown precipitate, which gives with chloroform a yellow or brown solution; but carbon disulphide abstracts the iodine from the compound and liberates the papave-

* Read at the Evening Meeting of the Pharmaceutical Society of Great Britain, Dec. 6, 1871.

rine. The presence of the latter in the sample solution is, therefore, of no consequence.

6. Though solution of *narceine* does not reduce iodic acid, yet after being heated with lime or potash, it has that effect. But the proportion of narceine existing in opium appears to be so minute, there can be no risk of error from this source.

The requisite conditions being now better understood, the samples were examined afresh by the reduction process, and this time the results were deemed satisfactory.

This sketch of the course of the inquiry may serve to explain some parts of the process finally adopted, which I will proceed to describe :—

Apparatus.—Three strong tubes of colourless glass, like ordinary test-tubes in form, about eight inches in length and of exactly equal bore, which should be about half an inch. At first I used graduated tubes, but afterwards found it better to employ separate measures of smaller calibre, viz. a pipette to deliver 100 grain-measures; a tube-measure for 50 and 100 grain-measures; and a smaller one for 5, 7·5 and 10 grain-measures.

Standard Solution of Morphia.—Weigh off accurately one grain of pure and well-dried morphia, and dissolve it in 50 grain-measures of diluted sulphuric acid, B. P., and sufficient distilled water to make the volume exactly 1000 grain-measures. This solution will keep without appreciable change for some weeks.

Solution of Iodic Acid.—Place in a flask 100 grains of iodine, 100 grains of potassium chlorate, 1 fluid drachm of strong nitric acid and 2 ounces of water. Heat the mixture until the iodine is perfectly oxidized; nearly neutralize with sodium carbonate, then add an excess of solution of barium chloride. Wash the barium iodate by decantation, and boil it for half an hour with a fluid drachm of strong sulphuric acid and 3 ounces of water. When cold, filter and add water to make the bulk 6 fluid ounces.

Sample Solution.—If the opium is in the moist state, dry 100 grains on the water-bath, and after noting the loss in weight reduce it to *fine* powder. Put 20 grains of the powder into a two-ounce flask with 1 grain of oxalic acid and half a fluid ounce of alcohol sp. gr. 0·838, and having attached a condensing-tube to the flask, place the lower part of the latter in water hot enough to cause the spirit to boil gently, and continue the boiling for half an hour. Filter into a porcelain dish, and wash the residue with half a fluid ounce of hot spirit. Add to the filtrate half an ounce of water, and evaporate down to about a quarter of an ounce, stirring frequently, then add an ounce of cold water. After the mixture has stood for ten minutes or so, remove the precipitated resinoid matter by the filter, and wash it with a little cold water, adding the washings to the filtrate. Boil the latter with 10 grains of slaked lime for two or three minutes, filter, and wash the calcium compounds with hot water. Slightly acidulate the filtrate with solution of oxalic acid, and evaporate it down to about a fluid ounce. After cooling, add 12 grains of caustic potash and set aside for a quarter of an hour; then filter, and wash the precipitate with a drachm of liquor potassæ, diluted with two or three times as much water. Divide the filtrate into two exactly equal portions: pour one of these into a 1000-grain measure, add 100 grain-measures of diluted sulphuric acid, B. P., and water up to the mark and mix well. Finally, shake the small quantity of solution required for experiment—about half an ounce—with a fourth of its bulk of carbon disulphide, and pass it through a filter.

The Experiment.—Measure off with the pipette 100 grain-measures of the sample solution, and transfer it to one of the trial-tubes, add 100 grain-measures of carbon disulphide, and lastly, 50 grain-measures of iodic acid solution; then immediately close the tube with a sound cork and shake briskly for *half a minute*. The rose-coloured solution of iodine quickly subsides, but its brightness is sometimes rather obscured by a slight filmy deposit on the glass. In this case pour the contents of the tube into a clean one. Take next 100 grain-measures of the standard solution of morphia, and using a fresh tube, repeat the operation just described. Compare now the two rose-tinted liquids by holding the tubes side by side between the eye and a white cloud, or placing them against thin white paper attached to a window-pane. If the colours are equal in intensity, the powdered sample contains 10 per cent. of morphia. If unequal, add to the deeper one carbon disulphide in small successive measured quantities—say of 5 or 10 grain-measures at a time, as may seem necessary,—gently mixing it in with a glass rod. When by this means the tints have been rendered equal in depth, the calculation is simple.

Let v = volume in grain-measures of standard colour;

Let v' = volume in grain-measures of sample colour;

then $\frac{v' \times 10}{v} = x$ = percentage of morphia in powdered sample.

And if w = percentage loss of weight in drying, $\frac{100 - w \times x}{100}$ = percentage of morphia in moist sample.

Precaution.—The carbon disulphide used must remain colourless when shaken with solution of iodic acid.

In order to test the ability of the eye to discern slight inequalities of tint, the relative quantities of iodine in the standard and sample colours were sometimes estimated at the end of an experiment by Dupré's method. This was done by removing the supernatant aqueous liquid with a pipette, washing the solution of iodine with distilled water, transferring it to a stoppered bottle, and adding, with vigorous shaking, weak chlorine water from a burette until the colour just disappeared. The results are given in the subjoined table, and show, I think, that the eye has a fair claim to be trusted. When a number of morphia determinations have to be made the use of this iodimetric process is convenient, as only a single daily reference to the standard is then needed.

The time required for determining the morphia value of opium on the above plan is about two hours and a half. As regards accuracy and reliability, I may state, that so far as my experiments have gone —and they have not been few—the results have appeared, after careful scrutiny, to be nearer approximations to the truth than those obtained by the ordinary methods by precipitation. I have, therefore, much confidence in the process. Nevertheless, I am ready to admit that an analytical method which deals, as this does, with a substance so complex and variable in composition as opium, must have an extended trial before its reliability can be placed altogether beyond doubt.

Table of Results.

Sample.	Percentage of crude morphia obtained by B. P. process.	Weight of precipitate after washing with chloroform.	Amount of real morphia in precipitate estimated by reduction process.		Percentage of real morphia in sample as determined by reduction process.	
			Colorimetric.	Iodimetric.	Colorimetric.	Iodimetric.
1	13·8	12·8	11·0		11·3	
2	12·0	10·8	9·4		10·0	
3	11·2	10·0	8·8		9·2	
4	10·2	9·3	7·7	7·81	8·0	8·1
5	5·8	5·6	5·0		5·4	
6	16·2	15·0	13·6		14·0	
7	6·4	6·1	5·5	5·76	6·4	6·43
8	10·0	9·4	9·0		10·0	
9	13·8	12·6	11·0	11·2	11·5	11·8
10	11·3	10·6	9·6		10·0	
11	14·2	13·0	11·6		12·0	
12	6·1	5·7	5·0	5·13	5·1	5·28
13	10·4	9·8	8·7		9·0	
14	12·6	12·4	12·0		12·5	
15	11·4	10·1	8·8	8·6	9·6	9·5
16	9·5	8·7	7·6	7·4	8·3	8·48
17	9·4	9·2	8·8		9·5	
18	17·4	15·8	13·8	14·0	14·5	14·2

Sheffield, October, 1871.

[*The discussion upon this paper is printed at p.* 477.]

THE SYRUP AND RESIN OF TOLU, AND TINCTURE OF CINNAMON.*

BY A. F. HASELDEN, F.L.S.

The legitimate field of operation for the pharmaceutist is pharmacy, but, wide as that field may be, it is not always easy to supply the demand for original matter; nevertheless, facts not necessarily known to all do occasionally spring up, and which are considered worth recording.

Syrup of tolu, like many other preparations of the Pharmacopœia, would seem at first sight to be a very unimportant one; it has, however, been made more prominent by some pharmaceutists since the introduction of the hydrate of chloral. At any rate, there is more in the mode of preparation than is commonly given credit for. Though it is well known to you, I must, in order to make my observations clear to some, give the Pharmacopœia process. Balsam of tolu is boiled with distilled water for half an hour in a lightly-covered vessel, distilled water being then added, if required, to make up the quantity specified. When cold the liquor is filtered, and the sugar, being added, is dissolved by the aid of a water-bath heat, the product having a specific gravity of 1·330. The result of filtering, when cold, is the separation of small particles of resinous matter, with a mixture of cinnamic and benzoic acid floating upon the surface of the liquor,—a circumstance of which any student would or should be cognisant. If filtered whilst hot, this combination of acid would remain suspended, although not dissolved, in the cold syrup, which, when used as an adjunct in cough preparations, might induce, and has been known to do so, the very irritation or tickling about the fauces which it was intended to allay. In the last edition of Royle's 'Materia Medica' it is stated that the syrup of the P. B. is about twice as strong as that of the P. L.; this is an error of calculation, as the preparations are as near as possible identical. The older and harder the balsam of tolu, the larger the crop of crystals will be. On making the syrup, I separated from one quantity of ℥iij ʒvj of balsam 14 grains of crystals; and three or four months later, from a similar quantity of the same balsam, 34 grains. The quantity of balsam ordered for making the syrup appears larger than necessary, inasmuch as it is not exhausted; but that is not a matter of much moment, the object being, as I am told, to obtain a full-flavoured syrup. Besides this mixture of cinnamic and benzoic acids, which I hope to utilize, though the quantity obtained is small, there is the resin remaining. This I use, as undoubtedly many others do, for coating pills and some descriptions of granules.

In the Conference 'Year-Book of Pharmacy' for 1870, at page 53, may be found the following form for a pill-varnish, viz. Ether, 100 parts; *Balsam* of Tolu 10 parts; Colophonium 1 part; Absolute Alcohol 10 parts: macerate until the resin is dissolved. The tolu balsam must be previously digested four hours in hot water, and then dried and added to the rest. The mode of coating is by putting the granules with sufficient of the varnish, which is found out by practice, into a shallow circular porcelain evaporating-dish, and quickly shaking them round. The process of drying may be quickened by throwing them into a sieve, and keeping up the rotatory motion. Pills in large quantities in the same way; in small quantities, in pots having an egg-shaped bottom. I have employed a similar varnish for several years, but I simplify the form for preparing the solution. In the first place, I omit the colophony, or resin, as being neither necessary nor agreeable; and, instead of digesting *fresh* balsam of tolu in hot water, I take the resin of tolu, the waste product after preparing the syrup. I use less ether and more alcohol, thereby obtaining a less costly result, and one equally good,—the only advantage of a large quantity of ether being the drying of the varnish in a shorter time; but, for general purposes I find it dries quickly enough. If very rapid drying be necessary, methylated chloroform is the best solvent. My proportions are the following:—Resin of Tolu 3 parts; Rectified Spirit 6 parts; Methylic Ether 2 parts; well shake until all that will is dissolved. Use the clear solution. Iodide of iron pills are well preserved by this coating, and also granules of secale cornutum, as suggested by Dr. Skinner, of Liverpool. For preserving secale in a portable state the plan is good; for, if there should be any difficulty in swallowing the granules, they can be readily crushed into a coarse powder and taken with water. I have also employed this solution as a liquid-stopping for the teeth, applied by means of cotton wool, and have found it more manageable and less disagreeable than the various solutions of mastich. If it could be deprived of colour and odour without destroying its adhesive quality, it would be

* Read at the Evening Meeting of the Pharmaceutical Society of Great Britain, Dec. 6, 1871.

better still. I have tried for this, but, at present, without success.

Following a train of thought, I am led on to oil of cinnamon, which, by exposure to the air or the influence of oxygen, is converted into crystalline matter, hydrated cinnamic acid; and from this I turn to simple tincture of cinnamon, some of which, having been prepared a long time, has become sadly decomposed and altered for the worse. What I am about to state will, I think, be worth the attention of those who may edit the next edition of the P. B. In the London Pharmacopœia there were two tinctures of cinnamon, the simple and compound; the former composed of cinnamon and proof spirit; the latter, of cinnamon, cardamom, long pepper, ginger and proof spirit; the proportion of cinnamon in the compound preparation being only one-fifth of that in the simple. In the P. B. the simple tincture is alone retained. Of the two, I believe that the compound would have been more serviceable. As a warm flavouring menstruum or adjunct, the simple tincture possesses little or no real advantage over good cinnamon water; whereas, if a warmer aromatic in addition to cinnamon water were desirable, the compound tincture would be the very thing; it would answer a twofold purpose, which the simple does not. On the other hand, in addition, I think I can show that there is a positive disadvantage attached to the simple tincture. After long exposure to light in the ordinary position upon the shelf, it becomes much altered; in fact, thick, and throwing down a copious deposit, separable by filtration, leaving a poor solution, very unlike the original; taste and smell much changed, possessing more of a weak storax flavour than cinnamon. Had the menstruum for simple tincture been rectified spirit, the chances of decomposition would have been diminished. Simple tincture of cinnamon is not in daily demand in prescriptions, but it is sometimes. I have seen it prescribed with solution of perchloride of iron as drops (a form of prescribing I have always, as a rule, opposed). The production is not, at any time, a sightly one, being dark green, not unlike ink, even with a bright tincture; but with a decomposed one, though still green, it is not clear. This altered tincture may be rendered bright by filtration (*vide* specimens), but it no longer resembles its primitive condition either in taste or smell. It may be urged that the tincture should not be so old as to have become changed. True, but when a preparation is rarely ordered, its possible defects are forgotten, or overlooked until it is required. The tendency of modern prescribing leans, unfortunately, too much towards novelties, which are frequently dispensed without profit, and not required again until spoilt. But to return to my tincture. I have never seen the compound tincture of cinnamon similarly altered; and I would suggest that a better and more generally useful tincture might be prepared upon the basis of the compound tincture of the P. L., using rather more cinnamon and less cardamoms—for, as it formerly stood, it partook more of the character of cardamom than cinnamon—retaining the other ingredients, and substituting rectified spirit for proof; or if not rectified, at least a stronger spirit than proof. Should it still be considered desirable to retain the simple tincture, I would recommend that it be prepared with rectified instead of proof spirit, as I am of opinion that it would then remain a longer time unchanged.

PHARMACY IN EDINBURGH IN THE OLDEN TIME.*

BY JAMES MACKENZIE.

(*Concluded from page* 446.)

In 1656, the physicians had the matter again revived, during the Protectorate of Cromwell, to whom a memorial was presented. It was then affirmed, that such were the public abuses in matters of medicine that frequent murders were committed, in all parts of the kingdom, by quacks, women, gardeners, and others grossly ignorant.

On the recital of such public abuses the application was again founded in order to obtain a patent. It seems to have been drawn up chiefly by Dr. Purvess, but had the names of seventeen physicians subscribed to it.

The abuses were described under eight distinct heads, which certainly left little unsaid that was likely to carry their point, and, as usual, the poor druggists had a sad time of it, in order to maintain their position with any degree of credit. Under the third head we find the following:—"The unwarrantable vending of drugs, simple and compound, by druggists and apothecaries, not only in common sale but in the dispensing of physicians' receipts, and these generally carious, sophisticated, and every way corrupted, and of this the most deadly poisons, without security taken from the buyer, or any other restraint, as is found by the great difference in medicines in their operatione here from what is found abroad."

But this is not all, for in the fourth abuse mentioned we have the following, which speaks of the exorbitant prices charged for medicines:—"The great gains which the apothecaries have made has so increased their number, that to make them all live there must be a strange extortioning of the lieges; so 'tis no extraordinary thing to charge half-a-crown for a mercurial bolus, not worth three halfpennies; a crown for ane emulsion, not worth a groat; forty pence or 4*s*. sterling for a drop weight of Jesuits Powder, or powdered cinchona, and that to be repeated once in two hours; thus, in an account we find 2700 pounds Scots, or £225 sterling for decoction of sarsa, and £3 sterling for a pint of Lower's Bitter Tincture has been charged and paid; £20 sterling for a course of mercury, and if any of these matters of fact be controverted, chapter and leaf may be cited." See an account of the rights and privileges of the College of Physicians and Surgeons, Edinburgh, supposed to have been written by Dr. Eccles, Edinburgh, in 1707; also Sibbald's Memoirs of the College of Physicians, a MS. in the Advocates' Library.

The physicians were nearly successful in getting from Cromwell all they desired. The patent was made out, sent down to Edinburgh, and everything seemed to be in the most prosperous condition, when once again they were doomed to disappointment; this happened in 1656. In the following year a conference was held in Dundee, at which a deputation of physicians from Edinburgh, and some representatives from the Aberdeen University, met to consider the nature and extent of the powers to be conferred by patent on the physicians. It is said that at this conference the separate interests of the parties were arranged, while the claims of surgery and pharmacy, as may be supposed, engaged no small share of their time and consideration. Thus, in 1657, Edinburgh men were the first to hold what may be termed, at least to some extent, a Pharmaceutical Conference.

Following up this we find, that two young Scotchmen, Andrew Balfour and Robert Sibbald, both of respectable families, went the one to Italy and the other to Holland, in quest of medical knowledge. They afterwards met in France, and being both ardent students of natural history, an intimacy was formed which, on their return

* Read at a meeting of the North British Branch of the Pharmaceutical Society, Edinburgh, November 24th, 1871.

to Edinburgh, was renewed and strengthened. With the view of promoting the study of botany and the cultivation of medical plants, they agreed together to take a small piece of ground in the abbey yards, forming, it is presumed, a portion of the palace gardens. As they proceeded their views expanded, while others became interested in their undertaking. A larger piece of ground was afterwards taken from Trinity Hospital, which has since been known by the name of the Physic Gardens, where, by the unwearied zeal and activity of Dr., afterwards Sir Andrew Balfour, and others, it became the most renowned medicine garden in Great Britain. This was the origin of the Edinburgh Botanic Gardens, now so widely and so justly celebrated, which, curiously enough, as you are all aware, are now under the charge and superintedence of one of the same name as its great founder, Professor Balfour.

During this time the physicians never lost sight of the grand object of their ambition. Meanwhile, the encroachments of the surgeon apothecaries had become insupportable; therefore, to every other and higher motive self-interest infused new vigour into the exertions, which the physicians put forth for the attainment of their object; and, notwithstanding the most strenuous opposition from the surgeons, clergy, nobility and others, and after long discussion of the matter in Privy Council, the charter of incorporation was obtained, *without any restriction on the druggist*, and the great seal appended on St. Andrew's day in 1681.

Immediately on receiving this charter the physicians entered with great zeal upon the fulfilment of the functions assigned to them. At this period pharmacy had a new and important era inaugurated. At their first meetings the publication of a pharmacopœia engaged their chief attention. To purge the list of the materia medica, and to secure accuracy and uniformity in pharmaceutical preparations then existing, were subjects which forced themselves upon their earliest consideration. When we think how rude and manifold the mass of materials were out of which a selection had to be made, we may form some small idea of the importance of the work, both in the interests of pharmacy and the advancement of medical science, in our own city. After years of labour, the first edition of the 'Edinburgh Pharmacopœia' made its appearance in 1699, which contained nearly nine hundred articles of the materia medica. Here, it is worthy of remark, that during the 172 years which have intervened, we have become acquainted with the medicinal properties of innumerable articles before unknown; yet, the pharmacopœia of today has been considerably reduced. In the first Edinburgh edition we see strong proofs of the prejudice and superstition, which lingered even in the master minds of that age. Amongst the approved pharmaceutical preparations some contained from forty to seventy articles. Notwithstanding all this, the first edition of the 'Edinburgh Pharmacopœia' was an improvement upon any which had previously existed, this superiority being fully maintained in all subsequent editions.

From the middle of the last century till the beginning of the present one, we have no records bearing on pharmacy, which adequately convey to our minds its real condition and working. We have learned something, however, from those who in early life knew how things were conducted in the special calling of a druggist, which designation afterwards came to have the word chemist prefixed. Dating from the above period, we find that there were a number of well-conducted drug shops in the city; amongst them we may mention the following, that of Mr. White's, in the Lawn Market, with whom the late Mr. Duncan, that worthy father in pharmacy, served his apprenticeship; Mr. Moncrieff, North Bridge, to whom the Lords of Session and Baronets of that name are related, and with whom that much-respected and public-spirited citizen the late Baillie M'Farlane served his apprenticeship; then Mr. Manderston, of Rose Street, who by the way once occupied the honourable position of Lord Provost; also, Mr. Milner, who carried on business in the first flat of a house in High Street, and many others too numerous to mention. At this time the system of sending out ordinary medicines and the mode of dispensing prescriptions, was conducted in a different style from that of the present day. However respectable those were who carried on business at that time, their free-and-easy system would seem very strange to us. Drugs were sent out in a style we should be very apt to call careless, having no carefully printed labels, such as we use. Pills were put up in small paper bags; liquids with the name of contents or directions written on paper and tied round the neck of the bottle, and very often without any name at all; while the various alkaloids were known only to a very limited extent, and thought of as a chemical curiosity. The introduction of many of these by Edinburgh chemists, and the changing of many of the absurd modes of nomenclature, inaugurated another new era in pharmacy. I cannot pass from this subject without mentioning the advantages the young pharmacists of to-day enjoy, compared with those in olden times, when the large mortar was their constant companion, and all the gums, resins and roots were powdered in this manner. Had they pills to make, the aloes, gamboge, scammony, etc. had all to be powdered first, there being no pill machine to roll them off, only the old rude tile or small portions of the mass rounded between the thumb and fingers. The wants of the lieges, however, were well attended to, because from seven o'clock in the morning till ten or eleven at night, drug shops were found open, but these days have long since given place to a better system of things, which might even yet be improved.

Though we can now look back and criticize the doings of our ancestors, yet, in many respects, we owe them a debt of gratitude, and, certainly, we should prove unworthy sons of worthy sires, had we not made those advances which have obtained for our city that high and honourable position we now hold in the science of pharmacy.

A NEW SWEET VOLATILE PRINCIPLE FOUND IN THE CAOUTCHOUC OF BORNEO.

BY AIMÉ GIRARD.*

This caoutchouc yields a new saccharine substance—designated by the author as *bornesite*—which is crystalline, very soluble in water, slightly soluble in alcohol, melts at 175° without alteration, and, like dambonite sublimes at 205° with slight decomposition. It does not ferment, neither does it reduce the potassio-tartrate of copper, but acquires the property of reducing this reagent by being boiled for several minutes with water slightly acidulated. Treated with a mixture of sulphuric and nitric acids, it forms a nitrated product, insoluble in water, soluble in alcohol, from which it is deposited in the crystallized state, fusible at 30°–35°, and detonating loudly when struck.

Bornesite has the composition $C_7H_7O_6$, and when heated to 120° in a closed vessel with fuming hydriodic acid, decomposes, like dambonite, into methyl iodide and dambose—

$$\underset{\text{Bornesite.}}{C_7H_7O_6} + HI = CH_3I + 2\ \underset{\text{Dambose.}}{C_3H_6O_3}.$$

Dambonite and dambose have no effect upon polarized light, but bornesite possesses a rotatory power of 32° to the right, or nearly half that of pure cane-sugar under similar circumstances. Dambonite and bornesite may be considered as dambosates of methyl, the combination of two molecules of dambose in bornesite creating in the latter the power of rotating a ray of polarized light.

* Compt. Rend. lxxiii. 426–429, from the *Journal of the Chemical Society*.

THE CHICAGO COLLEGE FUND.

The following is a list of the Committee which has been formed and subscriptions and books promised up to December 8th:—

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Parcels of books, specimens of chemicals, or articles of the materia medica, apparatus, and subscriptions (the whole of which will be expended by the Committee in the purchase of similar contributions) may be sent to Professor ATTFIELD, 17, Bloomsbury Square, London, W.C. Cheques, crossed "London and Westminster Bank," and Post-Office Orders, drawn for "High Holborn," may be made payable to JOHN ATTFIELD.

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[Duplicates of books, lecture-specimens, etc., will be dealt with by the Committee, at their discretion, for the general benefit of the Fund, unless instructions to the contrary are forwarded with the parcels. Gentlemen are invited to inquire of Professor ATTFIELD, 17, Bloomsbury Square, London, W.C., as to whether or not copies of the books, etc. which they propose to give have already been contributed.]

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Williamson's Chemistry for Students.

Thomas Hyde Hills.

Two Portraits of Jacob Bell.
Two Portraits of William Allen.
Two Portraits of Jonathan Pereira.
Bell's Historical Sketch of Pharmacy.

MEETING OF STUDENTS.

A Meeting of the students, at 17, Bloomsbury Square, was held on Tuesday, the 5th instant, under the presidency of Mr. Davies, for the purpose of raising a fund among present and recent students of pharmacy throughout the country, to assist their fellow-students in Chicago by providing the College of Pharmacy in that city with books, specimens and apparatus, to replace those lost in the late Fire.

A Committee was chosen to carry out the necessary arrangements. Subscriptions (limited to 10*s.* 6*d.*) or contributions of books, etc. will be thankfully received by the Treasurer, Mr. R. H. Davies, or the Secretary, Mr. W. H. Shenstone, at 17, Bloomsbury Square, W.C., and duly acknowledged in the PHARMACEUTICAL JOURNAL.

The Pharmaceutical Journal.

SATURDAY, DECEMBER 9, 1871.

Communications for this Journal, and books for review, etc., should be addressed to the Editor, 17, *Bloomsbury Square.*
Instructions from Members and Associates respecting the transmission of the Journal should be sent to Elias Bremridge, *Secretary,* 17, *Bloomsbury Square, W.C.*
Advertisements to Messrs. Churchill, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE BRITISH PHARMACOPŒIA.

Professor Redwood has brought before the Society a subject of very considerable interest and importance, and one with which he is especially qualified to deal. We print his paper *in extenso*, and recommend a careful perusal of it to all, whether pharmacists or medical practitioners, who are interested in the improvement of the art of pharmacy. The main question under consideration is, as to the desirability of introducing some alteration into the system of weights and measures at present employed in the prescribing, dispensing and compounding medicines, so as to do away, at least to some extent, with what cannot be regarded other than as a reproach to British pharmacy. We are the possessors of a Pharmacopœia which we are justly proud of, since, having regard to all its features, it is unrivalled in the world for accuracy, conciseness and general practical tone, but, so long as the present anomalous system of quantities remains in use, it can never approach much nearer to completeness.

Professor Redwood has suggested the substitution of proportional or relational numbers for specified weights and measures in the description of processes in the Pharmacopœia; but we cannot help thinking that should his suggestion be adopted, it will be only as a temporary expedient, merely paving the way for the introduction of a more perfect system.

We look forward to the day when a decimal system of some kind will be introduced into all dealings with quantities.

The metric weights and measures are being taught to most boys and girls throughout the country, and as the merits of the system come to be more and more extensively recognized, this instruction will become an essential part of primary school education.

We may, therefore, fairly calculate on this general introduction of decimals some twenty or five-and-twenty years hence. In the meantime, a provisional system, adapted to the purposes of the Pharmacopœia and of pharmacy generally, will be acceptable; and the proposals of Professor Redwood seem likely to be subject to little objection beyond that which attaches to change of any kind. It will be seen from the discussion which ensued upon the reading of the paper, that it received a considerable amount of criticism, most of which was replied to, and to some extent successfully combated by the Professor. In addition to the points raised by the speakers on that occasion, we might suggest in reference to one of the difficulties met with in working out the plan, that the specific gravities of all the liquids employed are known, and, consequently, that it would be no difficult matter to arrange the proportions of ingredients in those preparations in which both solids and liquids occur, so that one part of each solid may be represented by an integral number of parts of the resulting solution or mixture, and yet the amount of liquid to be employed may be expressed in measures. Thus, in an instance quoted in the paper, it is proposed to weigh syrup instead of measuring it. But to avoid the dislike which some practical men might have to this, it would be simply necessary to divide the number of parts by weight by the specific gravity of syrup, and substitute in the formula this *measure* for that *weight*.

In the preparation of a new edition of the Pharmacopœia, however, we do not anticipate for Professor Redwood a task of so much difficulty and labour as in the case of the last. Much experience has been gained and much information elicited from recent discussions. Pharmacists will be doing good service in the cause of their art by continuing to bring forward hints as they crop up in daily business, and a topic is now before them which well deserves their careful consideration.

ILLNESS OF THE PRINCE OF WALES.

The *British Medical Journal* and the *Lancet* publish detailed accounts of the inquiries recently made at Londesborough Lodge and in the neighbourhood of Sandringham Hall. Amongst other things that have been ascertained, indicating very defective sanitary conditions, it appears that the water used for domestic purposes at Sandringham is in a very unsatisfactory state, while at the neighbouring town of Lynn it is described as being no better than the effluent water from a sewage farm. These conditions, which are capable of being so pernicious to health, appear to be referable to that want of any adequate means of dealing with domestic refuse, which is an evil not confined to this district, but prevalent to a serious extent throughout the whole country.

CHICAGO.

A dread calamity, the details of which are known to all the world, has happened to this prosperous and energetic city. It would be idle to describe the terrible misfortune which the press has so faithfully portrayed. Houses desolate, families destitute, and business stopped. In face of this *baptism of fire*, England has to herself proved true, and nobly supported her character for benevolence. Help from innumerable sources has arrived. Pharmacy has not stood aloof, and we refer with unmixed pleasure to the efforts at this moment made, both to express intense sympathy, and to have the honour of sharing in the re-establishment of the Chicago Pharmaceutical Museum and Library. An influential Committee has been formed. We do not generally like a *large* Committee—but this is representative. The presence of so many names is simply an indication of hearty fraternal desire on the part of British Pharmacists to aid America. The list on the Committee includes the names of the Presidents of Pharmaceutical Associations in seventeen of our leading towns, all of whom have offered their active services. The President and leading Officers of the Pharmaceutical Society of Great Britain, together with the Officials of the British Pharmaceutical Conference have promised personal assistance. The chief wholesale druggists, including Sir Thomas Dakin, chairman of the Chicago General Relief Fund, have joined the movement; while better than all, the students have espoused the cause and are engaged in collecting books and subscriptions from apprentices and assistants. Fortunately for Chicago, Professor Attfield has undertaken the burden of executive direction. Parcels of books, museum and lecture-specimens, apparatus and whatever thoughtful kindness can suggest, may safely be intrusted to his care. Cheques and money subscriptions will be devoted to the purchase of books and other contributions. Some donations have been received—at present necessarily few. The Council of the Pharmaceutical Society has voted a bound set of Journals and Indexes. Mr. Joseph Ince has presented fifty-four selected volumes—chiefly foreign—some educational. The students' subscriptions vary from one shilling to ten, others from half-a-guinea to ten guineas. We sincerely hope to see a multitude of small contributions.

Let us learn from this fearful visitation, never to mourn as those without hope. The darkest night *must* have its morning; the blackest cloud cannot for ever shut out the sunshine—there is a resurrection power in this life as also in that to come. Should Chicago rise from its ashes, as it most certainly will, more prosperous than ever; should its citizens emerge from their fearful trial rejoicing as a strong man to run a race; should their hour of sorrow have gained them the sympathy and knit them in the closest bonds of union with another country; there may come a time when thanksgiving may replace distress—then let them call to memory the old, old story, when centuries ago three children passed unharmed through the burning fiery furnace, but there was one whose name was love walking in the midst.

A very pleasant feature of the movement that has been set on foot to assist in restoring the library, museum, and apparatus of the Chicago College of Pharmacy is the warmth with which it has been taken up by the students at Bloomsbury Square. As will be seen upon reference to another column, a meeting was held on Wednesday last, and a committee appointed to make an appeal to all the recent and present pharmaceutical students in the country. We hope the result will be a good one, for we are sure the sympathy shown will be none the less welcome to Chicago students as coming from those who are now, or recently have been, themselves students in England.

Transactions of the Pharmaceutical Society.

MEETING OF COUNCIL.

December 6th, 1871.

MR. A. F. HASELDEN, F.L.S., PRESIDENT, IN THE CHAIR.

MR. EDWARDS, VICE-PRESIDENT.

Present—Messrs. Atherton, Betty, Bottle, Brown, Carr, Greenish, Groves, Hills, Reynolds, Sandford, Savage, Shaw, Smith, Stoddart, Williams and Woolley.

The minutes of the last meeting were read and confirmed.

The President read a letter from Professor Attfield, asking the assistance of the Society towards reinstating the Chicago College of Chemistry in the matter of books and specimens, which had all been destroyed by the late fire; and suggesting that a complete set of the Pharmaceutical Journal, with indices, would be very acceptable.

It was moved by Mr. Sandford, seconded by Mr. Williams, and carried unanimously, that a complete set of the Journal in volumes, with indices, be presented to the Chicago College.

The Report of the Finance Committee was presented, showing on the General Fund Account a balance in the Treasurer's hands of . . . . £1320. 16*s*. 8*d*.
And submitting for payment sundry accounts amounting to . . . . . . £803. 7*s*. 7*d*.
On the Benevolent Fund Account a balance of . . . . £206. 4*s*. 5*d*.

Resolved—That the Report of the Finance Committee be received and adopted and payments made.

Resolved—That the Report and Recommendations of the Benevolent Fund Committee be received and adopted.

Mr. Shaw said he was somewhat astonished some time ago at hearing it stated that many people were under the impression that the Benevolent Fund was more than equal to the demands upon it. If not so, he should like it to be clearly stated.

The Secretary stated that the annuities granted absorbed more than the interest of the money invested. The Fund was therefore not equal to the demands upon it.

A grant of £10 was made to the widow of a deceased member of the Society. (Second grant.)

Resolved—That a list of subscribers and donors to the Benevolent Fund, accompanied by some account of the objects, and rules under which grants from the Fund are made, should be published for distribution.

The reports of several meetings of the House Committee were read, including an estimate for alterations in the basement of the Society's premises, for the purpose of affording additional accommodation for the Professors of Chemistry and Botany, and the Curator, etc.

Mr. Sandford explained at some length the proposed alterations.

Mr. Williams said the matter had received a good deal of attention from the Committee, and he hoped the report would be adopted. The rooms in question had been taken into possession by the Society, in consequence of greater space being required.

Resolved—That the Report and Proceedings of the House Committee be received and approved.

Resolved—That the Report of the Library, Museum and Laboratory Committee be received, and further estimates for printing the catalogue of books in the library be procured.

The Committee reported that they had accepted Mr. Howlett's estimate for three new mahogany cases and a table for the museum.

Resolved—That the Report and Recommendations of the Parliamentary Committee be received and adopted.

The Committee reported that a case of prosecution which had been commenced against an oilman in London, for selling Oxalic Acid, had been settled by the defendant's paying the penalty of £5 and costs into court.

REPORTS OF THE BOARDS OF EXAMINERS.

November, 1871.

ENGLAND AND WALES.

Examination.	Candidates examined.	Candidates passed.	Candidates failed.
Major	3	2	1
Minor	32	22	10
	35	24	11

Two certificates of examination (one from the College of Preceptors, the other from the University of Cambridge) were presented to, and accepted by, the Board in lieu of the ordinary Preliminary examination.

SCOTLAND.

Examination.	Candidates examined.	Candidates passed.	Candidates failed.
Minor	7	2	5
Modified	3	1	2
	10	3	7

One certificate of examination from the University of Edinburgh was presented, and accepted by the Board in lieu of the ordinary Preliminary examination.

The PRESIDENT presented the following Special Report from the Board of Examiners on the Preliminary examinations:—

Rather more than three years have elapsed since the passing of the Pharmacy Act, 1868, which rendered special examinations, and thereby education, compulsory upon all intending to practise pharmacy.

There are three stages in these examinations; the First or Preliminary for those who at the passing of the Act were apprentices or students, or if serving as assistants were under twenty-one years of age, and for all who may hereafter enter the business; 2ndly, the Minor examination for those who intend taking up only the title of Chemist and Druggist; and 3rdly, the Major, for those who desire to obtain the more honourable one of Pharmaceutical Chemist.

It is to the first of these, or the Preliminary examination, that attention is now directed.

The Bye-Laws of the Pharmaceutical Society, section x., paragraph 12, describe the Preliminary examination as being a test of knowledge of the Latin language, English grammar, composition and arithmetic; and the Board of Examiners has defined the extent to which the examination in each subject shall be carried, so that its exact requirements may be understood; it is as follows:—

"The examination is a written one, and comprises Latin, translation into English of a paragraph from the first book of Cæsar (De Bello Gallico), or a passage from each of the following works:—Pereira's 'Selecta e Præscriptis,' and the last edition (Latin) of the London Pharmacopœia.

"Latin Grammar.

"English Grammar, Composition.

"The first four rules of arithmetic, simple and compound, vulgar fractions and decimals.

"Certificates of having passed the local examinations of the Universities of Oxford, Cambridge, or Durham, the examination of the College of Preceptors, or those of any legally constituted examining body previously approved by the Council, *provided Latin and arithmetic are included in the subjects*, are accepted in lieu of this examination."

The 5th of October, 1869, was the day on which these compulsory examinations were commenced, and nine have been held since that time.

At first, the precise nature of the examination not being fully understood, great success was scarcely to be expected; but, as regards subsequent examinations, the details having been fully explained in public, the Board looked, and surely not without reason, for great improvement.

It is with unfeigned regret that the Board is obliged to confess that replies are no better, while the percentage of failures remains the same.

To alter this state of things, alike painful to the Board and disheartening to the candidates, a review of the past is now contributed.

Taking the numbers of four examinations, it will be found that out of 1101 candidates, 714 passed and 387 failed, an average with a trifle over of 35 per cent. of failures. The highest number of any one of those who passed is found to be 285 out of 300, and the lowest 150, just sufficient to pass. In order that a correct opinion of the cause of failure may be formed, it may be as well to give further particulars.

In each subject it has happened upon several occasions that *no* mark has been given, 3, 4 and 5 have been the lowest numbers given out of 100 for Latin; 5, 8 and 10 for English; and 5, 8 and 10 for Arithmetic. This has occurred more frequently in Latin and English than in Arithmetic. In the four examinations of 1871, 170 candidates obtained less than one-*fourth* the number of marks in Latin, 64 in English, and 44 in Arithmetic; 362 less than *half* in Latin, 275 in English, and 204 in Arithmetic. Thus, it is clearly shown by these numbers that Latin and English, especially Latin, are the stumbling-blocks, and more particularly Latin Grammar, for where that is deficient failure in English Grammar and Composition is to be expected. Arithmetic, though occasionally at fault, cannot be said to be deficient; on the contrary, in many cases, it has been the means of passing candidates, the large number of marks obtained for it making up for the deficiency in the other subjects.

A few samples of free translations from the Latin may be given without offence:—

Quod reliquum est balneo aquoso ad idoneam crassitudinem consume—translated, 'what remains is balneum water to be taken at the same time to-morrow;' quartâ quâque horâ—frequently rendered 'every fourth part of an hour;' lactis vaccini recentis—recent vaccination being calmer; summo mane deglutiendus—to be taken in the morning when the pain is raging; et perfice sicut de syrupo althææ præceptum est—and pass through tow upon syrupus althææ and collect the precipitate; fiat haustus, mane deglutiendus—make a draught to be taken as a jelly; 'coccum' is construed 'cocoa.'

There is evidence here of great want of education, besides guess-work. It would be better to give no answer or no translation than one which is destitute of sense. These examples are from pharmaceutical Latin. Cæsar would furnish equally inaccurate ones. To the questions in grammar the replies are little better as a rule, and often given without the least bearing upon the question. Arithmetic is nearly always well done, but the English composition generally falls deplorably short. The real nature of the subject selected is often misunderstood; there is an absence of style,—a want of accuracy of expression; the illustrations are inapt, the words badly selected and too frequently repeated; the construction of sentences is imperfect, while the connection between one sentence and another is obscure, the spelling is faulty, and the commonest rules of syntax are disregarded.

How can this be altered? Two classes have to be considered, those already in the business and those about to enter it. Of the former there are three divisions, viz. those apprentices of one, two, three, or four years' standing, those who were apprentices when the Act was passed and have since become assistants, and those assistants who neglected registering at the time proper to qualify them for passing the Modified examination. Where elementary education has been neglected the case is difficult; where good, a little systematic persevering study will recover much that has been lost. In either case, they should work with hearty goodwill at the grammar and medical Latin, with which, from their business experience, many of these candidates, under ordinary circumstances, should be well acquainted. For apprentices of any number of years' standing, the early education being good, a little perseverance should set all right; but for those who never have been properly educated, there can be but one course—go to school as soon as possible. But how is this to be accomplished? Employers must aid in this good, this essential work. They can materially assist, and in this way: let some time, either morning or evening, be devoted to study; do not say there is no time, but *make* it.

In every town are to be found teachers obtainable at a moderate cost quite equal to the task. Those gentlemen who, knowing what was passing respecting pharmaceutical education and examinations during the last ten years, yet took apprentices without reference to the amount of education they had received, should help in this great work.

It has been clearly shown that Latin is the first desideratum; let its study be raised to a proper standard, and English will soon follow in the same direction. But, let what may be done, it must be with a will and determination to conquer, and that can only be accomplished by industry, attention and perseverance.

Thus far concerning the apprentices and assistants above alluded to who are actually in the business, having regular business duties to perform, who must, if they are *to commence business as chemists and druggists*, pass the Preliminary examination, and after that, in due course, the Minor.

For them a certain amount of sympathy is felt, and for them masters are solicited to give, as they most conveniently can, time for study and help in carrying it through.

There is the other class which claims at the present time some attention,—the class of future apprentices.

It has lately been put forward that the Preliminary should be passed before indentures of apprenticeship are signed; be it so. The Board is of opinion that this point cannot be too strongly impressed upon parents who may be desirous of placing their sons as apprentices to chemists and druggists or pharmacists, nor upon those gentlemen who undertake the responsibility of having apprentices, for, whatever may have been in the past, it is clear that in the future they should pass either the Preliminary of the Pharmaceutical Society or the Local Examination of one of the Universities or other approved examining body before indentures are signed; this accomplished, a source of anxiety, alike to pupils, parents and masters, would be successfully dealt with, and the apprentice would be able to devote mind and body in acquiring a just and proper knowledge of the business, and becoming in every respect a better and more serviceable apprentice to his master, who, at the same time, would feel that he was instructing one in whose educational attainments he could place confidence.

In drawing up this report—setting forth the candidates' weak points and suggesting a possible way of overcoming their difficulties—but one spirit has pervaded the Board and induced it to take this course,—an honest desire to help those who evidently stand in need of it, and at the same time draw attention to that which is most desirable for the future. Although the Board looks upon the number of failures as large, it is believed that other Examining Boards experience the same results; but the Board is most desirous of seeing a reduction in the number of failures.

It is recommended to present candidates that they should read attentively the remarks made for their guidance which have already been published in the Pharmaceutical Journal, Third Series, No. 50, p. 994.

Mr. Carr said he had been much pleased, on recently trying to negotiate an apprenticeship for a young man in whom he took an interest, to find that his passing the Preliminary examination was insisted upon before the indentures were signed. He hoped this would become general.

Mr. Woolley said he had no doubt that this report would be of great national benefit, in pointing out the deficiencies which existed in education at the present day; but he regretted that the Report had not gone also into the question of the Modified examination.

Mr. Brown was glad Mr. Woolley had called attention to this matter, which he thought was an important omission from an otherwise able and very instructive report.

A long discussion followed, in which Messrs. Stoddart, Smith, Groves, Atherton, Savage, Edwards, Sandford, Reynolds, and the President took part; and it was ultimately understood that if Mr. Brown, or any other gentlemen, would furnish data to work upon, the President would endeavour to draw up a special report on the Modified examination.

It was then resolved that the Report should be published in the Pharmaceutical Journal, and that a separate copy should be sent to each Member of Council and Local Secretary.

Resolved—That the following having passed the Minor Examination be elected Associates of the Society:—

Anderson, Alexander	Elgin.
Breckon, Hugh Scott	Whitby.
Bryden, John	Edinburgh.
Druce, George Claridge	Northampton.
Hanbury, Frederick Janson	London.
Hyne, Harry	Bristol.
Mason, Jonathan	Workington.
Peel, Alfred	Manchester.
Walsh, Albert	Richmond, Surrey.
Warner, George Henry Q.	March.
Wooldridge, George	Birmingham.

Three persons, having paid their subscriptions for the present year, and a nominal fine of one shilling, were restored to membership.

Resolved—That the following having been duly registered as Pharmaceutical Chemists, be respectively granted a diploma stamped with the seal of the Society:—

Hughes, James	Swansea.
Peters, David	Llandilo.

Resolved—That a copy of the Journal be sent regularly as published to the Leicester Chemists' Assistants and Apprentices Association.

EXAMINATIONS IN EDINBURGH.

November 28th, 1871.

Present—Messrs. Aitken, Buchanan, Gilmour, Kemp and Young.

MINOR EXAMINATION.

Seven candidates presented themselves; *five* failed, the following *two* passed, and were declared qualified to be registered as

CHEMISTS AND DRUGGISTS.

Graham, John ....Dumfries.
Bryden, John ....Edinburgh.

The above names are arranged in order of merit.

MODIFIED EXAMINATION.

Three candidates presented themselves; *two* failed, the following passed, and was declared to be duly qualified as a

CHEMIST AND DRUGGIST.

McAdam, Robert ....Glasgow.

PRELIMINARY EXAMINATION.

A certificate was received from the undermentioned in lieu of the Society's Examination.

McNaught, Andrew ....Belfast.

(*Certificate of the University of Edinburgh.*)

PHARMACEUTICAL MEETING.

Wednesday, December 6th, 1871.

MR. A. F. HASELDEN, F.L.S., PRESIDENT, IN THE CHAIR.

The following Donations to the Library and Museum were announced, and the thanks of the Society were voted to the donors:—

Catalogue of Scientific Papers (1800-1863), Vol. V.: from the Royal Society,—Life and Works of Cavendish: from Professor Redwood,—New Remedies; a Quarterly Retrospect of Therapeutics, etc.: from Messrs. W. Wood and Co., New York,—Fine crystallized specimens of Cyanide of Potassium and Permanganate of Potassium: presented by Messrs. Hopkin and Williams,—Bark of *Cinchona calisaya* grown in Java, and infected by Mycelium; five specimens of *C. officinalis* bark, from different localities; Roots of *C. succirubra* and *C. officinalis*, grown in India; Section of a Stem of *C. officinalis* grown in India; Section of a Stem of *C. succirubra*, grown in South America (the whole of the specimens being in illustration of Mr. Howard's paper read at the last meeting): presented by Mr. J. E. Howard, F.L.S.,—Bark of *Rhamnus Frangula*, the Black Alder of Northern Europe: presented by Mr. H. C. Baildon,—a sample of Zanzibar Aloes: presented by Mr. F. J. Hanbury,—Bark of the *Cundurango*, or Eagle Vine: presented by Mr. Rowland Cox,—sample of very fine Asbestos: presented by Mr. Slipper,—German Herb Knife for coarse comminution: presented by Mr. E. T. Agnew.

Dr. TILDEN exhibited to the meeting a cabinet for holding labels on the dispensing-counter, which had been invented by Mr. Shephard, Pharmaceutical Chemist, of All Saints' Road, Westbourne Park, a former student in the institution. He said it was well known that labels often got into a dreadful state of confusion. The principle of the cabinet in question was very simple. Each compartment was fixed on a pivot, and when pulled forward the front part of the case came down and exposed the labels, so that they could be easily removed. When a label had been taken out the door would fall back, in consequence of being weighted at the back. The arrangement was in fact self-acting, and it appeared to him (Dr. Tilden) a very capital one. The cabinet before the meeting was only a model.

Mr. ALLCHIN asked whether the cabinet would be applicable to the general labels used by chemists and druggists?

Dr. TILDEN considered that it would be applicable to any labels, and even to slips of papers for powders.

Mr. HILLS said that he should think it was a very useful arrangement. It was quite new to him, and he thought it might be turned to account in its present form, or perhaps some further improvements could be made in it.

Mr. BLAND asked whether the cabinet was intended to stand in a vertical position? It seemed to him that if it was, that would be a very serious objection, as there were three or four hundred different kinds of labels in use, and the cabinet would occupy an inconvenient amount of space.

Dr. TILDEN said that even the small model before the meeting would hold a very large number of labels.

Professor ATTFIELD considered that the position of the cabinet would be an advantage rather than otherwise, as in most shops there was some amount of vertical unoccupied space at the backs of doors, showcases and elsewhere.

The PRESIDENT then invited a discussion on the paper by Mr. Greenish, on "Pharmacy in North Germany," read at the last meeting.

Professor ATTFIELD said he should like to ask Mr. Greenish whether, in the course of his visit, he noticed any general organization throughout Germany for the representation of pharmacy? The chemistry of Germany was unquestionable. They had taken a very leading position in that country in matters relating to pure chemistry, and also to the application of chemistry to the arts generally, but he was unaware whether there was anything which corresponded to the Pharmaceutical Society here in Great Britain, or to the Pharmaceutical Conference which met once a year in the provinces.

Mr. GREENISH replied that he thought he might say positively that there was nothing of that kind in North Germany, but he believed that now that Prussia had absorbed the minor States, and there was to be one German Pharmacopœia, it was probable there would be more union among the pharmacists of North Germany. There was a Pharmaceutical Society at Berlin, but comparatively few chemists belonged to it, and its meetings were more for trade purposes than for scientific purposes.

Mr. WALTER HILLS said that during a visit of a few weeks to Germany he attended several lectures on chemistry by Professor Hofmann, and he was surprised to find so great a number of students present. The theatre was intended for 220 persons, and there were present, generally speaking, about 250, 30 of whom were standing. Among other novelties there were two ladies, one of whom was a Russian apothecary. The laboratory also was quite full, and he believed that in order to obtain a bench it was necessary to bespeak it before the commencement of the session. Professor Hofmann told him that he had 90 working students in the laboratory at Berlin. As regarded anything approaching to a Pharmaceutical Society in Berlin he believed, as Mr. Greenish had said, that the meetings of that Association were more for trade than scientific purposes. He could speak very highly of the lectures which were delivered in Berlin. They lasted for an hour and a half, commencing about half-past nine in the morning. In reply to a question, Mr. Walter Hills stated that the lectures were for general chemical students and not for pharmaceutical students only. The lectures were paid for, but strangers were admitted to single lectures as a privilege.

The PRESIDENT said there were several points in Mr. Greenish's paper which would furnish material for another very long paper. Among these were the fly-labels; no competition in Germany; the fixed price to rich and poor; the difficulty of getting apprentices and assistants; the necessity of every apprentice having passed a preliminary examination before he entered the trade of chemist and druggist; and the very honourable light in which the Germans held the Pharmaceutical Society. Those were a few points, but there were many more which might very well be extended into another good paper in the hands of some contributor. He should like to see such a production in the columns of the Journal.

The PRESIDENT then called upon Professor REDWOOD to read a paper on "The Substitution of Proportional or

Relational Numbers for Specified Weights and Measures in the Description of Processes in the Pharmacopœia."

[This paper is printed at p. 461, and gave rise to the following discusssion:—]

The President said that the subject was a very important one, upon which he was not at present prepared to offer any remarks. From what Professor Redwood had told them, it was clear that to his mind an alteration might be accomplished without any great difficulty. He (the President) was inclined to abide by the decision of Professor Redwood until he had an opportunity of turning the matter over in his own mind.

Dr. Tilden said that Professor Redwood had had so much experience, and had expended so much thought upon the construction of the Pharmacopœia, that he felt a little hesitation in offering any remarks, but if he might make a slight suggestion, he should recommend the adoption of the name "*pond*" for parts by weight, and "*vol*" for parts by measure. Each of these units must of course have a definite value, which must be distinctly understood. He should further suggest that the weight of a "*pond*" should be a decigram, which was about a grain and a half, and of course a "*vol*" would be a volume corresponding to that weight. He believed that the application of a name, specially employed for this purpose, would be likely to facilitate the use of the system. He protested against the introduction of any more chemical processes into the Pharmacopœia, inasmuch as in the majority of cases they were not followed by manufacturers, and it was well known that pharmacists were not in the habit of making chemical preparations for themselves. It was, moreover, an objection that, in the case of the alkaloids, the process must vary in detail on every occasion in which it was employed. Take the special case, for instance, of digitalin, which had been alluded to, or aconitia, or he might allude to aloes, with which he was specially familiar. The extraction of the crystalline principles from those substances would be effected by processes which would vary according to the quality of the crude drug operated upon, and other circumstances. It was well known that sometimes aconite, for instance, would yield a far larger quantity of aconitia than at others; and he believed that any minute details such as were set out for all the processes of the alkaloids especially, in the Pharmacopœia, were almost superfluous, simply because they were not applicable in every case. Then, in the case of chemical preparations he was not sure whether it was a valid objection; but it was an objection to a certain extent to set out the ingredients one after another, as in the case of chloroform, which was represented in the paper. He knew an instance of a student going to work to make chlorate of potash, and getting the biggest pan he could obtain, and putting into it the lime, the carbonate of potash, the manganese, and then pouring on it the hydrochloric acid. There was a constant tendency to that sort of thing. People making such preparations were very apt to look through the ingredients, weigh them out, and put them all together without reading through the processes. Chemical manufacturers, as he said before, followed their own processes, which they had learnt from experience, and which, on that very account, were superior to any which could be given to them.

Mr. Groves said they all were much indebted to Professor Redwood for bringing this subject forward. No doubt there was room for improvement in the mode of stating the quantities in Pharmacopœial processes, but, with all due deference to Professor Redwood, he thought the proposed plan not sufficiently simple. He should prefer expressing proportions of fluids in minims or fluid ounces, the whole compound equalling 1000 of such. He should much regret adopting any system that would tend to necessitate the weighing instead of measuring fluid in dispensing prescriptions. The loss of time by such an arrangement would be something enormous, and become a very serious objection. In cases where solids were dissolved in liquids, the expression would be x grains in 1000 minims. In mixtures of solids the grain would be the sole unit, and 1000 grains the weight of the whole. Could every item be brought to the centesimal standard, it would of course very much facilitate the work of prescribers. He did not see the advantage of introducing grain-measures into the Pharmacopœia, and should prefer sticking to the old and well-understood minims and ounces. He offered these few hasty remarks with every sense of their imperfection, and without any intention of committing himself to them definitively.

Mr. Bland said he had some difficulty in saying anything upon a subject like this, especially after Professor Redwood, but it seemed to him that some of the difficulties which he had shadowed forth as to the present state of the formulæ in the Pharmacopœia would not be removed or simplified by the alterations proposed. Like very many other persons who were advancing in life, he began to feel more and more a tendency towards a sort of conservative feeling, and he thought there was nothing so bad or so inconvenient for them as pharmacists as to be continually changing. If alterations in the direction suggested by Professor Redwood were to be made it must mean nothing more or less than this, that they must eventually adopt the metric system altogether. So long as the weights of solid substances and the measures of liquids were divided on a totally different system, it would be utterly impossible so to arrange the parts and measures as to avoid confusion with regard to the quantities. He would take as an instance the proposed formula for spirit of camphor. It had been stated camphor 1 part, rectified spirit 9 measures. Well, suppose he was going to make spirit of camphor. He should at once take 4 ounces of camphor and 36 fluid ounces of rectified spirit. But some of his friends whom he saw around him in the wholesale trade would think that was a very peddling little operation, and would be very sorry to lose their time in compounding such a quantity as that. How would they compound it then? They would make perhaps at least eight times that quantity of spirit of camphor, and they would say, "I am to take 1 part of camphor. What does a part mean?" If they took the part to mean a pound, they must immediately alter the relation of the rectified spirit, seeing that the measures by which the spirit was measured were component parts of a pint in the small quantity which he supposed was intended in the Pharmacopœia. The camphor would be estimated by ounces, and the rectified spirit also by ounces. He confessed he looked back with something like regret to the old pint of 16 fluid ounces and the old ounce of 480 grains. Whatever might be their inconveniences and defects, they had the advantage that they were divisible by a large number of factors, and did in that way very much facilitate calculation when proportions of ingredients were required to be used differing from the quantities set forth in the Pharmacopœia.

Mr. Williams said that the formulæ of the Pharmacopœia were intended for retail use, and the large manufacturers might be left to themselves. He certainly thought that the plan suggested by Professor Redwood was an exceedingly good one. It was easier for the mind to grasp the idea of measures or parts by weight as suggested by Professor Redwood than proportional parts of a thousand as suggested by Mr. Groves.

Professor Attfield said he could sympathize with the remarks made by a gentleman who seemed to represent conservative interests, but at the same time he thought there was a good deal to be said on the other side of the question. He himself belonged, in matters of this kind, to a very strongly conservative party,—to a party much older than the conservative party which was represented by Mr. Bland, a party which had been in the habit for many generations, for many centuries, of counting by tens, probably because every member of the race had ten fingers and ten toes. Now it seemed to him, in all these discussions about weights and measures, both of quantity and length and coin, we were coming back to what was the simplest plan, and that by means of which we could measure, weigh and calculate with the smallest amount of trouble; and that was the decimal plan. Whether that decimal plan would prove to be the metric or any other modification he did not know, and he did not very much care: but in the conviction that it was a decimal method which we were all drifting to, whether we liked it or whether we did not like it, he thought that the proposal of Professor Redwood was not only an important step, but the step which the time demanded in that direction. He himself believed that we should eventually come to the metric system of weights and measures, because it was that decimal form of measures and weights which had been adopted by the leading countries of Europe. But we in England were all strongly conservative, and we might not like to employ the Greek and Latin terms which were involved in the metric system of weights and measures; and it might be a generation, and perhaps more, before we should arrive at any desirable position in the matter. But he could conceive no better method of reaching the goal to which we seem to be drifting than by the adoption of this method of Professor Redwood. With regard to what Dr. Tilden had said, he could strongly sympathize with him. He also had found that students, who knew necessarily nothing of chemistry,—who came, in fact, to that institution and others to learn chemistry,—had always had an impression that a formula meant a catalogue of substances to be mixed together, *secundum artem.* He had met with the difficulty which had been alluded to, but it seemed to him that that difficulty was not any argument in favour of the abolition altogether of chemical processes from the Pharmacopœia, but rather one for the recasting of the language of the Pharmacopœia in reference to chemical processes, for the educational value of the latter was considerable. He should be disposed, with a view of meeting that difficulty, to retain the form of language used in describing Galenical preparations, and to somewhat alter the arrangement of paragraphs and sentences in those formulæ relating to chemical preparations, so that there might be an obvious difference to the eye of those who knew nothing of chemistry, between a Galenical formula and a collection of weights and measures of substances which are to be put together, and which, when put together, will act chemically upon each other.

Mr. Allchin said that it appeared to him that the proposition made by Professor Redwood was open to no objection whatever; but, with regard to the introduction of the metric system, there were many difficulties to be overcome. It was not a question for pharmaceutists only, but for the whole medical profession. Men who had been to college, and just passed their examination, did not expect to have to go to school again. There would be a strong opposition to any attempt to introduce the decimal system into the Pharmacopœia.

Mr. Lenton said that, with regard to the present grain and minim, they were really founded on nothing at all. There was no standard for them. But the metric unit was pretty much what Thomas Carlyle would call one of the "eternal verities." He (Mr. Lenton) believed that our calculations would and must at last come to the metric system. Students would find that they could divide by ten more easily than by any other numbers, and he believed that students would offer no opposition to the metric system on the ground of difficulty.

Professor Redwood said that, although unwilling to detain the meeting from the hearing of other papers, yet out of respect for the speakers he must say a few words in reply. He was very much obliged to Dr. Tilden for his suggestion as to the substitution of the two words "*pond*" and "*vol*" for part and measure; but he (Professor Redwood) thought that words already in use in the sense in which he proposed to adopt them, were preferable to new terms. Some persons might be puzzled by "*pond*" and "*vol*" and might think that they were some special quantities instead of terms applicable to any quantities. He entirely agreed with what Dr. Tilden had said with respect to chemical processes in the Pharmacopœia, and he had opposed the introduction of some of those given in the last edition. Wherever a perfectly clear definition could be given of a chemical product, he believed that definition would be quite sufficient. He thought, however, that Dr. Tilden had fixed upon an unfortunate illustration in stating his objection to giving the chemical processes. He had mentioned digitalin, which was precisely a case in which there would be a difficulty in omitting the process. In that instance the process must be stated in order to define what the digitalin was. There were two or three kinds of the substance, varying according to the processes by which it was prepared, and the digitalin of the Pharmacopœia was not the simplest form of the active principle of digitalis. In that case, therefore, the process must be described, as the digitalin could not otherwise be defined. Mr. Groves had objected to the weighing of fluids. Well, it was not part of his (the Professor's) method that they should change from the measuring to the weighing of fluids, except in a very few special cases. He admitted that the habits of our British pharmaceutists were such as would not exactly agree with having to weigh in every case. The method of giving proportional numbers, as adopted in Continental Pharmacopœias, was made very simple if everything was weighed. All that was needed was to give numbers which might represent grams or any other equal weight, the same denomination being applied throughout. He thought, however, that Mr. Groves would find that there was only a small number of cases (not a dozen altogether) in which they would have to weigh liquids according to his (Professor Redwood's) proposition. He could not help thinking that there was a manifest advantage in weighing the syrup in confection of opium, and having a product in which the active constituents bore a definite relation to the whole. He was much obliged to Mr. Groves for suggesting, with reference to spirit of camphor, that which certainly had not occurred to him (Professor Redwood) before; and he certainly concurred that spirit of camphor should be made of such a volume that the camphor should bear a definite relation to the whole product, either weight to measure, or weight to weight. He must here, however, say in his own justification, that his present object had rather been to elicit, from practical men, an opinion as to how far it was desirable to attempt to carry out in the completest manner a method which he had described only in its broad features. It would involve, if applied to the Pharmacopœia, a great amount of calculation and reworking of all the old processes; and he had not thought it necessary or judicious to enter upon a work of that description until he was able to ascertain how far such a method was likely to be received with favour and permanently adopted. Otherwise, he might work for a year or two in the reconstruction of formulæ according to the new method, and then find at last that the method was not approved of and that all the time occupied by his calculations had been thrown away. There were many improvements which might be made in simplifying the processes, but what he had done was chiefly to apply his method to the processes of the Pharmacopœia as he found them. Some of the other points which had been raised had been already answered in the course of the discussion.

A paper by Mr. T. Miller, of Sheffield, "On a Method for the Estimation of Morphia in Opium," was read by Professor Attfield.

[This paper is printed at p. 465, and gave rise to the following discussion:—]

The President said that this paper was a very interesting one, and the results given in the table certainly appeared to be rather satisfactory. The only question which arose in his mind was as to the use of the eye of the operator in arriving at a conclusion. Different operators might arrive at different conclusions on the same specimen, and some people could not distinguish colours at all.

Professor ATTFIELD said Mr. Miller did depend upon the colour of his solution of iodine in disulphide of carbon; but his experiments showed that his eye could be trusted, for he had performed other experiments in which he did not trust his eye, but estimated the iodine by another method. Moreover, Mr. Miller referred to the possibility of any operator not being able to distinguish accurately the differences in nearly similar shades of colour, and showed that this difficulty could be controlled, if an operator wished to control it, by another method,—Dupré's method. It occurred to him that, if there was any objection to this process of Mr. Miller, it was not exactly the usual one against volumetric methods, viz. that it would occupy far more time to prepare standard solutions than to make a gravimetric determination, because, although that was a very tangible and valid objection in many cases, still operators had frequently to examine a great number of samples, and then the volumetric method was immensely useful, and saved an enormous amount of time. That was not an objection which seemed to him to attach to Mr. Miller's method; but it was this, that this process most peculiarly seemed to depend more than most volumetric processes on the observances of a great number of conditions, and, therefore, it was not likely to be so popular a process as when a volumetric method depended upon some definite constant reaction. However, he thought the Society was greatly indebted to Mr. Miller for the labour which he had undergone in carrying out this investigation, because there were many other points of view from which it was excessively interesting. The nature of the reaction was peculiarly so. He believed that many years ago the reaction of iodic acid on morphia was investigated, but without any definite results. There was enough done, however, to show that by careful working the nature of this reaction might probably be made out; and if this paper of Mr. Miller's should lead him, or induce any other gentleman, to continue the investigation and ascertain what the reaction actually was between iodic acid and morphia, and the exact conditions under which the reaction occurred, then his process might have a considerable value, for he supposed every one who had attempted to estimate the amount of morphia in opium (at all events any number of times) would have found a very great deal of difficulty, and would hail with pleasure any suggestion which would be likely to economize the time, and enable him to get at better results than he could now obtain by the current processes.

Mr. WILLIAMS said he thought the paper was a very important and interesting one. He wanted to ask this question:—Was he to understand that the iodic acid solution was merely made from 200 grains of iodine mixed with six ounces of water, after a very complicated chemical process, in which the iodate of barium was thrown down and washed, and afterwards decomposed? Was there no other way of standardizing that solution?

Professor ATTFIELD: Yes, by a weighed quantity of morphia.

Mr. WILLIAMS said it seemed to him that it should be standardized. He thought there were the germs of a good process, but it required working out still more; and the point with regard to the standard character of the iodic solution was one that must be decided in a very different way from the process given in the paper.

Professor REDWOOD said that one objection which seemed to attach to this process, and one which Mr. Miller had, in fact, himself indicated in his first experiments, was that the iodine first set free was soon lost to a great extent. Mr. Miller had attempted to overcome that difficulty, and probably he had succeeded, in some degree, by removing the iodine from contact with the organic matter in the solution as quickly as possible.

Professor ATTFIELD: In half a minute.

Professor REDWOOD said that, although it might be removed in half a minute, still there was a race between two reactions. They knew what iodine as well as chlorine would do when brought into contact with organic substances. There was a loss of free iodine, and the extent could not be known, and the whole of the iodine did not at last contribute to the colour. That seemed to be a fundamental objection; and any of those persons who had had experience in testing for the presence of starch in complex organic liquids by means of iodine, must have met with frequent cases in which they could get no reaction at all, the iodine being disposed of as free iodine before even the colour-test of starch could be produced. He had met with cases of that description in testing for the presence of starch in sarsaparilla solutions, and other complex organic liquids. The reason why Mr. Miller could not at first get any results that were reliable was that the iodine was left in the presence of organic matter, and was so disposed of, and hence did not contribute to the colour. This objection to the process of Mr. Miller might not be so serious as it appeared; but he (Professor Redwood) confessed that he should feel greater reliance on a direct method by which the morphia was got out, so that it could be weighed and tested, than on an indirect method of this description, more especially when it was considered that although the object of the process now described was to economize time and to save trouble, it seemed to be a more complicated process than that given in the Pharmacopœia. He might say that he had himself been working upon this subject for a considerable time, and had made a great number of determinations of the quantity of morphia in opium, by the several known processes, including that described in the Pharmacopœia. He should hail with great satisfaction a good volumetrical method of estimating morphia, but he feared that the process of Mr. Miller was rather an untrustworthy one. He (Professor Redwood) had arrived at the conclusion that the process given in the Pharmacopœia was the best. He admitted with Mr. Miller that the Pharmacopœia process was somewhat tedious, but he thought that the details of it might be modified so as to render it less tedious. The time occupied was taken up chiefly in percolating and exhausting the opium by percolation. The process might perhaps be improved in that respect.

Mr. ALLCHIN said that perhaps he might be allowed to describe a process which he had followed for some years in the estimation of morphia in opium. It consisted merely of exhausting the opium with water, and evaporating down the aqueous solution. He took 100 grains, and evaporated the solution to an ounce and a half. He then dissolved a drachm of sesquicarbonate of ammonia, and mixed the two solutions; collected the precipitate on a filter, and washed it until the solution ceased to pass through coloured. He found that opium gave about 21·5 grains of impure morphia. He was aware that in some cases this would not be a proper way of estimating opium, but it would be very easy for those who prepare opium to introduce a little chloride of calcium to procure a corresponding precipitate. He believed, however, it was a very correct way of estimation. At the time opium was dear he obtained various specimens, and tested them by this process, and, curiously enough, each result corresponded with the price of the opium, proving to him that there was a very correct estimate in the market of the value of the opium. If the sample was likely to contain lime or some salt, it would be necessary to carry the process one step further; perhaps liquor potassæ might be used to dissolve out the alkaloid, leaving the inorganic salt behind.

Mr. GROVES said that there was no doubt that Professor

Redwood had hit the blot in this paper. In the presence of morphia and other organic principles, the iodine would soon displace hydrogen and become invisible. The action of iodine on narceia was very peculiar. They were aware of the dark blue colour obtained by adding to it free iodine. On warming the liquid the colour disappears temporarily, and when it reappears is of much diminished intensity. Fresh iodine restores the colour. This series of reactions can be continued until iodine no longer produces a blue but a brown colour, like that of the periodides of the alkaloids generally. He could not help, however, expressing his admiration of Mr. Miller's paper, whilst entertaining the opinion that it was not truly practical. He should be surprised if such a complicated process could be got through in two hours and a half.

Professor Redwood said it certainly could not be accomplished in that time if the drying were included.

Mr. Groves, continuing, said that the processes for the estimation of morphia in opium were very numerous. He met with a new one every six months or so, but they all failed in one particular, viz. the long time required for carrying out the operation. He had thought of trying if Mohr's method might not be modified, so as to be made alkalimetrical, and at the same time sufficiently accurate for trade purposes. The mixture of lime and opium is of such a texture as to be very readily exhausted with water; and if the amount of percolate were made a fixed quantity, he thought that the addition of a standard acid would indicate the quantity of the lime compound present, from which the quantity of morphia could be calculated, with, of course, certain corrections, such as experiment alone would point out. The rapidity obtainable by some such method would seem to justify a trial or two.

Dr. Tilden said that he was under the impression that iodic acid had been quite condemned as a reagent for morphia, simply because the reaction was not definite, and because iodic acid was similarly decomposed by other substances. They all knew what a complex body opium was. There were at least twenty-five different alkaloids described as having been derived from opium, and until the reaction of every one of these had been ascertained, he should question the accuracy of such a process. That objection would apply to any volumetric process for morphia, because it would be necessary to ascertain the reaction of the reagent on every one of those organic principles before the operator could be sure that the reaction he was examining was due entirely to morphia.

Professor Attfield remarked that another important point, in addition to the action of iodic acid on the alkaloids of opium, was the action of the iodine that was set free on these alkaloids. Dr. Tilden had worked upon the question of the action of iodine on the alkaloids of opium and the formation of the periodides, and perhaps he could say something on that subject, confirmatory or otherwise, of what Mr. Miller had stated.

Dr. Tilden said that iodine combined with nearly all the organic bases, decomposing one portion of them to form hydriodic acid, and forming compounds which in most cases seemed to be tri-iodides, consisting of a molecule of the alkaloid *plus* a molecule of hydriodic acid *plus* two atoms of iodine. Those compounds were perfectly definite and crystallizable substances, so that a certain portion of iodine might be disposed of in that way. It was possible that might account for the disappearance of some of the iodine. Disulphide of carbon would not be capable of removing iodine from such a compound, and so would not become coloured. The compounds were not soluble in the disulphide.

Professor Attfield said that Mr. Miller's remarks were confirmatory of those now made by Dr. Tilden, with one exception. Mr. Miller said that iodine water, when added to a slightly acid solution of papaverin, produced some sort of compound from which disulphide of carbon abstracted the iodine and liberated the papaverin. That seemed to be an exception. It seemed to be the general rule that disulphide of carbon did not attack these combinations.

The President gave a summary of the contents of a paper written by himself on "The Syrup and Resin of Tolu, and Tincture of Cinnamon." [This paper is printed at p. 467.]

The meeting was adjourned to the 7th of February, 1872.

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

The Fourth General Meeting of the Society was held on November 23rd; the President, Mr. E. Davies, F.C.S., in the chair.

The following donations were announced:—Current numbers of the 'Pharmaceutical Journal;' the 'Journal of the Liverpool Polytechnic Society;' an 'Abstract of the Proceedings of the Liverpool Geological Society, 1870–71;' the 'New York Druggists' Circular;' and 'A Metric System of Arithmetic.'

Specimens of alum, illustrating Spence's process of manufacture, were presented to the Museum by Mr. Williams.

Mr. Abraham said that there had been lately in the Pharmaceutical Journal a good deal of correspondence respecting tincture presses, and as the subject seemed to have considerable interest, he would mention his experience with respect to them. He had for eighteen years used an hydraulic press made by Mr. Coffey, and found that it remained as good as new. The diameter of the ram was $4\frac{2}{16}$-inch, of the piston of the pump $\frac{7}{16}$-inch, the area would therefore be as 36 to 1, and the lever would multiply the power twelve times. Altogether, the power of the hand would be multiplied 432 times; and, supposing the pressure of the hand to be 50 pounds, the press would raise about 10 tons. Messrs. Hayward, Tyler and Co. had introduced a compound press which was calculated to exert a pressure twice as great as this. But he did not find that the price of the hydraulic press had been reduced since he bought his. On the other hand, Mr. Staples had described a screw press, which was said to exert pressures as great as these. He did not question the possibility of this, but his preference for the hydraulic press was founded on the facility with which a moderate, gradually rising to a great, pressure could be applied. But if Mr. Staples's press would bear the assumed pressure, any one who would look at the figures of it and of Messrs. Hayward's, as well as of other hydraulic presses, would see that the strength of the latter was greatly in excess of the necessities of the case.

In answer to observations by the Chairman and others, Mr. Abraham said that the form adopted by Messrs. Hayward involved a short ram which necessitated a screw over it, and added to the cost. The force that all who had used the screw press knew to be required to reverse the movement, indicated the force which had to be overcome before any useful pressure could be applied by means of it. He did not think that the leakage ascribed to the hydraulic press interfered with its application as a tincture press, because whatever press was used the tincture would soon cease to flow unless the pressure was renewed. He thought the hydraulic press would invariably be preferred were the price the same, and hoped that cheaper forms might be devised.

Mr. A. H. Mason, F.C.S., showed a specimen of Cundurango.

Dr. Charles Symes then read a paper, entitled "Observations on Practical Pharmacy."

A discussion on the subject of the paper followed, in which the President, Messrs. Abraham, Blood, Redford, Tanner and Armstrong took part.

A vote of thanks to Dr. Symes for his interesting paper was proposed, and unanimously carried.

GLASGOW CHEMISTS AND DRUGGISTS' ASSOCIATION.

The Fifth Meeting of the Session of this Association was held in the West Hall, Anderson's University, 204, George Street, on the evening of Wednesday, November 29th; the President, Mr. THOMAS DAVISON, occupied the chair, and there was a good attendance.

After the usual preliminary business, in course of which several new members were enrolled, the CHAIRMAN introduced Mr. M. H. Cochrane, F.C.S., who delivered the following lecture on "Coal and its Products."

Mr. Cochrane was frequently applauded in the course of his lecture, several of the beautiful experiments he performed being much admired; and at the close, on the motion of the CHAIRMAN, he was awarded a very hearty vote of thanks.

A short discussion then took place on the present aspect of the early-closing movement, but as the committee appointed at a recent meeting had not been able as yet to give in a final report, it was adjourned till next meeting.

On Wednesday evening, December 13th, Mr. J. L. Macmillan will read a paper on "Adulteration of Drugs."

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

THE CHICAGO COLLEGE FUND.

Sir,—Your leading article of last week has sketched the great loss sustained by pharmacists at Chicago, in the destruction of their college by fire. May I propose that a special appeal be made to pharmaceutical students throughout the kingdom, to assist our fellow-students on the other side of the Atlantic, by subscribing towards the re-furnishing of their college?

Pharmaceutical students, as a rule, are not rich, but they are kind-hearted, and would gladly help those who have been deprived of the means of continuing their studies. A "Students' Subscription List" has been opened here; and if a similar plan were adopted by the students in other schools and classes, and if students working at home would also forward contributions, either to Professor Attfield or the Treasurer or Secretary of our Students' Fund, the result could but be highly satisfactory from all points of view.

R. W. HOUGHTON.

17, *Bloomsbury Square, London, Dec. 4th*, 1871.

THE BETTS SUITS.

Sir,—It may interest some of your readers to be informed that the suit of *Betts* v. *Rimmel* was allowed to remain in abeyance until the result of the plaintiff's appeal in *Betts* v. *Willmott* was known; that the plaintiff has lately been pressed to dispose of the case; and that he has now abandoned his suit by presenting the common petition to dismiss his bill with costs to be paid by him.

FLUX AND CO.

Leadenhall Street, London, 5th Dec. 1871.

THE PRELIMINARY EXAMINATION.

Sir,—I have noticed a comment from W. H. J. in Saturday's Journal, in which, after quoting from a provincial paper, he proceeds to say, "I presume this was inserted as a cheap way of advertising the establishment to which this learned gentleman belongs." It would have been well had W. H. J.'s presumption not run so far. Lord Byron's lines,

> "A man must serve his time to every trade,
> Save censure—critics all are ready made,"

would certainly apply here. Happening to be in that particular neighbourhood about a fortnight since, it was a great pleasure to spend an evening with my old master, who then told me of this young fellow, an improver, having sent this communication to the paper, and expressed himself as very disgusted with the fact, dwelling especially upon the term with facility.

Had W. H. J. been as fully informed as I am, he might possibly have written in a different tone. As an old apprentice of an honourable man, and one who in former years had the especial good fortune to turn out many good business men, I do feel annoyed to think that he should be subjected to such a gratuitous insult, and do hope, that now from a perfectly disinterested party the true facts have come, he may, to a man advancing in years, if on that score alone, offer an apology for that which I feel sure must have caused some pain and annoyance.

November 20th, 1871. VERITAS.

[*** We have also received an anonymous letter, under the initials "*N. B.*," and purporting to be written by the person referred to in the paragraph. As an anonymous communication we cannot publish this letter, and moreover it seems impossible that it could have been written by any one who had passed the Preliminary examination.—ED. PHARM. JOURN.]

DEATH FROM AN OVERDOSE OF HYDRATE OF CHLORAL.

Sir,—In your report of the above case in last week's Journal, Mr. Cox says, "If sal volatile were taken at the same time as chloral hydrate, it would increase the action of the latter." I scarcely think that it would do so, as alkalies decompose hydrate of chloral. If we can increase the power of the latter by sp. ammon. co., why not prescribe them conjointly? the one being so much cheaper than the other. But I fear Mr. Cox's theory is a fallacious one, and will not be borne out in practice.

Brecon. B. S.

"A SWINDLE."

Sir,—A "gent," calling himself my brother, yesterday ordered in my name some three pounds' worth of goods of Messrs. Bourne and Taylor, Castle Street, Holborn,—of course taking a portion of them with him, and requesting the remainder to be sent on to me in the evening. Of course, also, I know nothing at all about it.

Unfortunately, Messrs. B. and T. were not aware that my brother, who is well known to them as an old customer, is an only brother.

The "gent" is about 5 ft. 3 in. high, and dark.

The trick may be repeated, and I will therefore ask you to give it publicity. ALFRED P. BAKER.

33, *Norfolk Terrace, Bayswater, 5th Dec.* 1871.

G. C. Druce.—(1.) Either may be adopted, according to the preference of the operator. (2.) We do not undertake to recommend particular makers: consult a Directory. (3.) Yes; apply to the Secretary. (4.) Trübner, Paternoster Row. (5.) About 4*s.* 6*d.*

"*An Assistant.*"—(1.) We do not know of any such books. (2.) Beasley's Druggists' Receipt-Book (Churchill), and Blaine's 'Outlines of the Veterinary Art.'

Dalrymple v. *Lakin.*—We have received a letter from Mr. Dalrymple, in which he states that our report of the above case was "incorrect in several very important points." We are obliged to him for the trouble he has taken in writing and forwarding another report of the case; but on comparing that with our own report in last week's Journal, we fail to see any difference which materially affects the general aspect of the case. We are compelled to defer the publication of an abstract of the decision in the case until next week.

P. Childs (Newbury).—Your letter conveys an individual imputation. We have therefore referred to the firm in question.

We are compelled by want of space to defer the publication of several communications.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. G. Mee, Dr. Lauder Lindsay, Mr. J. Mackenzie, Mr. C. R. Beckett (Melbourne), Professor Tuson, Mr. S. T. Severs, Mr. J. Bienvenu, Mr. J. M'Neil, Mr. Sharrah, Mr. Wilkinson, Mr. Spencer, Mr. C. Gerring, Mr. J. S. Harvey, Mr. Hustwick, Dr. Crace-Calvert, Mr. A. P. Baker, Mr. E. Fisher, Mr. F. J. Barrett, Mr. P. Sparrow, Mr. Lenton, "Oxygen."

PLEASANT BOTANICAL REMINISCENCES.

BY A. F. HASELDEN, F.L.S.

Papers setting forth the many advantages to be derived from the study of botany are not uncommon, but memory does not serve in reminding me of any written for this Journal upon the *enjoyment* obtained during the progress of botanical study, excepting two most excellent and notable, which formed the principal part, or, it might be said, the whole of Professor Bentley's opening addresses at the meetings of the Conference, of which he was President in the years 1866-7, *vide* PHARMACEUTICAL JOURNAL, Second Series, Vol. VIII. p. 108, and Vol. IX. p. 153. Should the lines which follow lead or induce any to turn back and read those addresses, the writer will have accomplished something. Not taking into account the satisfaction of well-regulated minds from the acquirement of knowledge generally, the study of botany offers gratifications beyond the gain of information, great as that is. The good botanical student will not be content with books, he will work in the school-room of Nature. The first gain will be that of becoming a lover of order, no small pleasure in itself. Without order and method in the progress, a great success must not be expected; persevering regularity in the work must be engendered; it is not a study at the outset, to be taken up now and then, or put aside for months; and it should be accepted in truthfulness and simple-mindedness; in every onward step there will be pleasure, never-ending sources of occupation; and what life, *devoid of occupation, is truly happy?* Mark the beauty of shape, the loveliness of colour, the almost boundless variety of flowers, grasses, ferns, mosses, algæ and fungi, from the very commencement, when learning that the cell is the foundation of vegetable structure; that the simplest plants are composed of individual cells; that those a little higher in the scale are made up of aggregations of cells; and from the formation of cells studying on until the majestic forest oak and beautiful palms are reached, there will be found a constant source of recreation. Think of the variety of forms of roots and underground stems; the differently-shaped leaves, their position on the stem and their office; the stems, the kinds of inflorescence and fruits; the internal and external structure, and the means of propagation. Putting aside generalities, let me draw upon the imagination, and picture the student, the real earnest student, rising in summer an hour or two sooner than the other inmates of the house; suppose him in the country or country town, the fresh morning air wafting gently through the open casement, now see him emerge with botanical case strapped across the back or fastened to the side, a stout stick, with well-curved handle, to help in stretching over a roadside ditch, or in hooking some flowers out of ordinary reach, a strong clasp-knife or small trowel in pocket to assist in digging round the roots, so as to enable him to secure the whole plant if possible,—the true botanist in some cases wants the roots, as well as leaves and flowers. Behold the glow of health upon his cheek as he returns for the morning meal. Unlike the sportsman who shoots the feathered race, or the angler coquetting with the finny tribe, the botanist is sure of sport; even when he does not obtain that which he is particularly seeking, he is certain to find some material for future examination and study. Though the honeysuckle, traveller's-joy or the dog-rose do not welcome him on the hedge, he may find, upon the turfy bank and roadside the slender harebell, yarrow, ragwort and toadflax; and in the meadows and cornfields, the gaudy poppy, the dandelion, daisy and buttercup; if when alone the enjoyment is good, how much more so when kindred spirits work the morning through! and when the noonday heat overtakes them near some village-green, when rest seems almost necessary, they wander on until they reach—

> "The hawthorn bush and seat beneath the shade
> For talking age and whispering lovers made."

Then sitting down upon the welcome bench, each from his box brings forth his stock of flowers, etc., and interchange is made of those which some have and some have not; then, one more experienced than the rest explains as well as he can the prominent points of difference between the specimens, enlarges upon the useful properties of one, and the dangerous peculiarities of another; how they may be best pressed and dried, fixed on sheets of paper, and arranged for the formation of an herbarium. And now wending the way towards home, if in early autumn time they pluck the bittersweet with berries bright and red from the hedge, or perchance the deadly nightshade with black and alluring but dangerous berries. Thus far some of the enjoyment of collecting at different times and seasons; then comes the satisfaction of sorting, arranging and determining the names and orders of some about which there was a doubt; also the innate feeling that the little stock of botanical knowledge is not all by the book. For those more advanced there remains the pleasure to be derived from the more recent discoveries and the communication of information often carried on by friendly correspondents. If an excuse may here be offered for those who do not take kindly to botany, it may be said that from the first this disadvantage has been attached to it, or the study of it, that it was considered as a part of medicine, and so whilst it was originally studied more as the means of discovering the qualities of herbs, etc., in their remedial capacity, the knowledge of them as plants or parts of the vegetable kingdom was not so much a matter of study or recreation, as a search after new remedies. I feel pretty sure that many a student has thrown up botany in disgust when left to himself, from the fact that at every step in the commencement of book teaching he feels as if he were learning the meanings of a long vocabulary of words derived from Greek and Latin roots; and it is rarely that this feeling is overcome, unless the student enjoy the advantages obtained from working under the direction of a professor or in a class with others. Having had the benefit of this, he knows how to work when left to himself. The enthusiastic botanist, like the painter, the musician, the linguist, or the author, is born a botanist; but a strong love of the science may be acquired, and a good acquaintance obtained, when its enjoyable part is better known and appreciated. In order to enjoy botany, it is not absolutely necessary that systems, orders, classes and alliances should at once be attacked. Being reminded that agreeable remembrances of botany should form the subject of this communication, I may sum up: there is, in the first place, the pleasure of acquired knowledge; secondly, that derived from the way in which it is acquired; thirdly, and not the least, the enjoyable association of kindred spirits; lastly, the healthy nature of it. I have purposely avoided the beaten track of mercantile gain and professional advantages, because I feel that there is in the pleasure to be derived more than sufficient to induce a love for the study of botany. I never pass down a country lane without finding amongst the wayside flowers food for enjoyment and contemplation.

Once more let me commend to all students the perusal of Professor Bentley's two addresses mentioned at the commencement of this communication, written with the view of encouraging the young, and reminding them that botany is not really the dry subject it has been too frequently designated, or at any rate that it has attached to it pleasant memories and associations.

A CHAPTER IN MICROSCOPY.

BY HENRY POCKLINGTON.

(*Concluded from page 442.*)

Optical Errors.—Errors of interpretation frequently arise out of certain well-known optical phenomena, and are less easily guarded against, because less expected. "Seeing is believing," says the old saw; but in optics seeing must very frequently be, *not* believing. One of these phenomena we have already glanced at in the case of the oil, air and water globules. A very similar case is that of the lacunæ in bone, so long mistaken for opaque radiating solids. Not unlike also are the cases of the concavity of the blood-corpuscle, the so-called tubular structure of the human hair, and the so-called hexagonal areolation of the valves of certain *Pleurosigmæ*. One rule may serve as guide here. Carefully alter the focus in the way we have just described. If the portion of the structure under view appear brightest when the distance between the objective and itself is *greatest*, and darkest when that distance is least, it may, with tolerable safety, be concluded that it is a superficial elevation. The rule is, of course, modified if the particular portion of the structure possess a different refractive power from its surroundings; but making allowances for this (any variation in this respect may be detected by altering the direction of the illuminating pencil), the rule may be relied upon with safety. The student may practise upon the eyes of insects, provided they be carefully mounted. We would recommend him to secure a really good specimen of the eye of a beetle (one in our possession, mounted by Mr. J. F. Barnett, of Tottenham, is exquisitely done), human hair mounted dry and in balsam, and a slide of *Pleurosigma formosum*, and to carefully study these under all possible conditions as regards the direction of the illuminating pencil. But, after all, the most perplexing phenomena are those due to diffraction. Perhaps, without plunging into mathematics, we may, in a few words, explain the cause of these phenomena before we attempt to discover a safeguard from their misleading tendencies.

These phenomena appear to have been first noted a little more than two centuries since by Grimaldi, of Bologna, but it is only within modern times that they have been thoroughly investigated. They are due to the fact, that a ray of light is, under certain circumstances, inflexed in passing the margin of an object. The phenomena may be easily observed if a diverging pencil of light be permitted to enter a dark room through a narrow aperture, and a knife-edge be held in the path of the pencil just above its point of divergence. The shadow of the object will be split down the centre by a bright line bordered with fringes of colours in harmonic progression; or, a grating of fine wires may be arranged so that no light shall enter the eye but has passed through the grating, when exceedingly beautiful effects, dependent upon the size and arrangement of the wires, will be produced. The phenomena are thus explained:* if the diverging rays, which are inflexed on one side of the pins or wires, meet those which are inflexed on the opposite side in the same phase of undulation (on crest or in trough of wave at same time), they coincide and produce a line of white light; whilst rays, which differ in their path, encounter each other under different phases, and interfere, producing either darkness or a coloured fringe. (The student at the seaside, or near a lake or pond, may study these phenomena at his leisure in visible waves of water.) Very similar in character to diffraction interferences are those known as thin-plate interferences, and we may conveniently study them together.

In microscopy we meet with the one when we study fine striæ, as in diatoms, some of which give a lovely iridescent glow when viewed by an intense beam of white light; the others, in such structures as the ramenta of Ceterach and certain vegetable hairs. Both are met with in certain histological preparations, where fine fibres lie side by side, or are interlaced, or where two membranes are closely superimposed. Very commonly in the barred, or pitted, vessels of plants, it is exceedingly difficult to decide whether the apparent puncture is complete, or whether the primal cell wall is still present, but uncovered by the later deposit, as it is visible only as a narrow band of a faint reddish colour, with, perhaps, a dark band round the centre. In a slide of the vessels of *Tropæolum majus* (nasturtium), now before us, there is a splendid illustration of this class of phenomena; and it was not without long and careful study that the true character of the structure could be made out, We did it at last by the use of homogeneous light, which, being obviously incapable of interference, enabled us to see, by aid of careful focusing, that there was really no complete aperture in the *cell under observation*, but that the later deposits of sclerogen had left the primal cell wall uncovered in those particular portions. This is, of course, a very common structure, the less frequent being the perforate one. The use of monochromatic light, in all cases where there is the least reason to suspect interference phenomena, is strongly to be advised. Careful use of the polarizer without analyser, but with and without selenite, is also, in many cases, of great service. The student may familiarize himself with these phenomena, and the way of dealing with them, by the careful study with low powers in a strong light of such things as these,—gratings of fine wires, meshes of fine threads or wires, films of mica having their surfaces broken up by being bent to a right angle and then reflexed, and, lastly, of such fine powder as the sporidia of *Lycoperdon* (puff-ball), and of various species of *Ustilago*. He will, after a course of such study, be able almost intuitively to pronounce as to the true character of the

* Brookes, 'Natural Philosophy,' 6th edition.

structure producing the interference, and find these very phenomena a great help instead of a plague and a torment.

A class of phenomena accompanying the use of "oblique illumination" should be considered here, but we must confine ourselves to pointing out the form the errors generally assume. The phenomena are strictly analogous to the second images seen when the image of an object is viewed in a thick looking-glass, and were, of course, due to successive reflections from the different surfaces of the mirror and its metallic coating. When such objects as diatoms are viewed by very oblique light from the mirror, these secondary images are very numerous, arising from successive reflections from the surfaces of the thin cover, glass slide, the object itself, and the medium in which it is mounted. These successive reflections produce the appearance known as false striæ, and may be detected by slightly changing the angle of incidence of the illuminating pencil, or by rotating the object in a horizontal plane.

Molecular Movements.—We must notice these very briefly, as our space has nearly run out. These, called often after their discoverer, *Brownian movements*, are hardly to be distinguished from those more properly called vital by any other than an experienced microscopist. Indigo, carmine or gamboge rubbed up in water is admirably adapted to show the movements, and a careful study of them will be the surest means of enabling the student to recognize them. Their want of power of choice (*i. e.* their movements are purely mechanical) is, perhaps, their sole distinguishing feature. The differences between Brownian and vital movements in small particles are so slight, that it is doubtful whether they can be described, or that anything but experience will enable the student to distinguish between them.

Certain sources of error of interpretation arising out of the use of the micro-polariscope and microspectroscope, must be deferred, as must also the discussion of a few other points with reference to the use of the ordinary stand. Enough has, it is hoped, been said to be of use to the student in microscopy, who, like the author, in his younger days especially, is pretty often at his wits' ends.

COD-LIVER OIL, ITS MANUFACTURE AND COMMERCE.

BY P. L. SIMMONDS.

(*Concluded from page* 444.)

In the *Journal de Pharmacie* for March 1866, my brother-in-law, Dr. Soubeiran, gave a description, with illustrations, of the apparatus and processes of manufacturing the oil which he found in operation in Norway, during his visit to the Bergen Fishery Exhibition. These seem to be chiefly two, one employed in many small establishments in Nordland, by which steam is conveyed by pipes from a boiler into closed casks containing the livers. These casks have cocks placed at different heights to draw off the oil as dissolved; the oil first obtained is much lighter in colour than that which comes away at the close of the operation. By this process a milky and turbid oil is obtained, without any bad taste, but which is less esteemed than that procured by more improved processes, as it is less rich in iodine and bromine principles, which become dissolved in the water introduced into the middle of the livers. To obviate this defect, in the larger number of factories established in Norway the livers are heated in boilers with double bottoms, which receive the steam, and in which the filtration proceeds slowly under the influence of heat. When the livers yield no more light oil, they are removed to a caldron holding from three to four barrels, and heated by fire, when a darker oil is obtained of which the Norwegians make great use for lighting purposes. After this the heat is increased, and, by boiling for about ten hours, the brown oil is obtained which is used for various industrial purposes. The resinous-looking residue is sold at about 5*s.* the barrel for manure. Unless care is taken in the selection of the livers and the preparation of the oil, it will often have an unpleasant flavour. Thus the liver of the coal-fish (*Gadus carbonarius*) does not possess the pure flavour and peculiar properties of the true cod-liver oil, and the livers of some of the cod caught late in the season, which have fed on the capelin (*Mallotus grœnlandicus*), yield an oil far from agreeable, and of a totally different flavour.

On the coast of North America many cod are caught with diseased livers, that evidence of a disordered or weak stomach. The sick fish are called "logies," from the heavy, lifeless feel of them on the line as they are drawn up from the bottom. The livers of logy cod are always more or less diseased. They are destitute of oil and of a dark colour, and not unfrequently contain abscesses filled with pus. Young fish are very rarely found to be inwardly diseased, so that, perhaps, after all the logies are aged individuals, whose vital organs are impaired by the gradual decay of nature.

Attention has been drawn from time to time to other fish-oils which might be used medicinally, but looking at the abundance of cod-liver oil in the two great seats of production, there seems little necessity for resorting to these, unless, perhaps, in India and Australia, where a native product might be more easily and cheaply obtained. The oil obtained from a small fish called the oolachan, abundant about Vancouver's Island, and the oil obtained from the *Halicore Dugong* have been recommended as substitutes for cod-liver oil.

Several years ago Mr. Gobley, of the School of Pharmacy, was engaged at Paris in preparing a medicinal oil from the liver of the ray, which was said to be much less disagreeable in flavour and odour than cod-liver oil. About the same time Professor Owen drew attention, in his course of lectures, to the services that might be rendered to medicine by the livers of the numerous sharks and dog-fish which are met with on our coasts, and especially in the equatorial seas, and which are generally rejected by fishermen. The advice of Professor Owen seems to have been followed, for in many localities, as on the coast of Norway, Canada, Australia and the Indian seas, the shark fishery is carried on largely for the oil obtained. The shark fishery of Norway yields annually 5000 barrels of liver.

In India, shark oil from the liver is prepared in great quantity at the ports of Mangalore and Tillichery, and an extensive fishery is carried on at Bombay; twenty years ago as much as 700,000 gallons of this oil was shipped from the ports of the Madras Presidency. M. Collas, principal naval surgeon and chief of the health establishments in

French India, states* that he has found shark-liver oil equally efficacious with cod-liver oil, and, moreover, has noticed its great usefulness as a medicine in certain ulcers of the inferior members, very common in equatorial regions, and against which other medicines were usually found ineffective.

The abundance of sharks in all seas, and especially in those warm latitudes, and the facility of the fishery gives an interest to this subject in a commercial point of view.

The medicinal employment of shark-liver oil opens up, however, a scientific question of some importance. Sauvages, the celebrated professor of Montpellier, has recorded a case of poisoning produced by the liver of *Squalus canicula*. Do these venomous properties belong to certain species only, or are they merely developed in certain conditions? We know that but little care is employed in the East in cleansing the livers or obtaining the oil, and putrefaction soon ensues in tropical climates. We would especially direct the attention of persons occupied with chemical inquiries and natural history to the study of this question, which is one highly interesting in a zoological and sanitary point of view to the inhabitants of warm countries.

THE PHYSIOLOGICAL ACTION OF CHLORAL HYDRATE.

BY M. H. BYASSON.

In a note presented to the Académie des Sciences,† in anticipation of a more detailed memoir, the author gives some of the results of an investigation having reference specially to the physiological action of chloral hydrate. The conclusions, which differ from those of Dr. Oscar Liebreich, and have been founded upon the comparative action of chloroform, formate of soda, hydrate of chloral, trichloracetic acid and trichloracetate of soda upon frogs, rats and dogs,—and incidentally of hydrate of chloral upon men,—are formulated as follows:—

1. The action of hydrate of chloral upon similar organisms is different from that of chloroform.
2. The action is peculiar to that body, and may be considered as the result of two products into which it is decomposed, principally upon contact with the blood, viz. chloroform and formic acid.
3. Trichloracetic acid and trichloracetate of soda differ from hydrate of chloral in their action upon the animal organism, since they both break up into chloroform and acetic acid.

A part of the chloroform formed by the action of the alkaline carbonates of the blood upon the hydrate of chloral is eliminated by the lungs; and a part of the formic acid is found in the urine in the shape of formate of soda. As a practical result of the experiments, the author found that he could distinguish three degrees, produced gradually and successively by increasing doses, but varying in individuals.

(1.) A feebly soporific action and slight sedative effect upon the sensitive nervous system, which may be accompanied by intervals of a peculiar agitation, similar to that produced by some dreams.

(2.) An energetic and powerful soporific action, with diminution of sensibility. Then follows a period of calm slumber of variable duration, but without apparent disturbance to the principal functions of life. By means of successive doses administered when the effects of the previous ones have nearly disappeared, this slumber may be extended during a comparatively long time.

(3.) Anæsthetic action, with complete loss of sensibility and muscular power. Death has generally been found to follow when this stage has been reached, in consequence of the inability of the organism to sustain the increasing action of so large a quantity of the drug until its complete transformation and elimination.

* "Note sur l'emploi médical et chirurgical de l'huile de foie de requin" (*Revue Coloniale*, March, 1856, p. 206).

† Comptes Rendus, lxxii. 742.

Chapters for Students.

CHEMICAL NOTES TO THE PHARMACOPŒIA.

BY WILLIAM A. TILDEN, D.SC. LOND.

DEMONSTRATOR OF PRACTICAL CHEMISTRY TO THE PHARMACEUTICAL SOCIETY.

Potassæ Bicarbonas, $KHCO_3$.—A pretty strong solution of carbonate of potassium is exposed to the action of carbonic acid gas, till, in consequence of the formation of the bicarbonate, and the inferior solubility of that salt, a crop of crystals has been deposited. This is one of those cases in which the manufacturer might have fairly been left to his own discretion as to the mode of operating, and the elaborate description of the apparatus to be employed omitted, with no disadvantage, from the Pharmacopœia.

The bicarbonate differs from the carbonate in being less soluble in water, in crystallizing in larger and more distinct crystals, in not being deliquescent, and in giving, with a cold solution of sulphate of magnesium, no precipitate.

Bicarbonate of potassium dissolves in about four times its weight of water.

Potassæ Bichromas.—Chromium is found chiefly in the form of 'chrome-iron-stone,' a compound having the formula $FeCr_2O_4$, or $FeO.Cr_2O_3$, and analogous to magnetic iron ore. This is pulverized and roasted with a mixture of carbonate of potassium and chalk, sometimes with the addition of a little nitrate of potassium, in a furnace through which a current of air passes. The ore is gradually disintegrated with formation of chromate of potassium and oxide of iron.

$$2\,[FeOCr_2O_3] + 4K_2CO_3 + 7O$$
$$= Fe_2O_3 + 4K_2CrO_4 + 4CO_2.$$

The chalk is added to keep the mixture in a porous state by diminishing its fusibility; a little chromate of calcium is thus frequently produced.

The solution obtained by treating the fused mass with water, and acidulating with sulphuric acid, yields red chromate of potassium. [§ In large red, transparent four-sided tables, anhydrous; fuses below redness; at a higher temperature is decomposed, yielding green oxide of chromium and yellow chromate of potash, which may be separated by dissolving the latter in water.

$$(2K_2Cr_2O_7 = 2K_2CrO_4 + 2CrO_3$$
$$= 2K_2CrO_4 + Cr_2O_3 + 3O.)$$

The bichromate dissolved in water gives a yellowish-white precipitate with chloride of barium ($BaCrO_4$), and a purplish-red precipitate with nitrate of silver (Ag_2CrO_4), and both these precipitates are soluble in diluted nitric acid. The solution also, when digested with sulphuric acid and rectified spirit, acquires an emerald green colour.] This last reaction results in the formation of the green sulphate of chromium, sulphate of potassium, and a mixture of aldehyde and acetic acid, as the results of the oxidation of the alcohol. It is quite parallel with that by which valerianic acid is obtained by the oxidizing action of the same mixture upon amylic alcohol. A mixture of potassic chromate with an acid is, indeed, employed very frequently as an agent by which the oxidation of organic as well as other substances is effected; for example, in the conversion of cinnamic acid into hydride of benzoyl (see B. P. Styrax Præp.), and in the volumetric process for the estimation of ferrous salts. Bichromate of potassium is one of a singular class of salts which contain the elements of the normal neutral salt and of the acid anhydride, *e. g.*:—

Bichromate of potassium . .	$\left\{\begin{array}{l} K_2Cr_2O_7, \text{ or} \\ K_2CrO_4 . CrO_3 \end{array}\right\}$
Nordhausen sulphuric acid .	$\left\{\begin{array}{l} H_2S_2O_7, \text{ or} \\ H_2SO_4 . SO_3 \end{array}\right\}$
Bisulphate of potassium . .	$\left\{\begin{array}{l} K_2S_2O_7, \text{ or} \\ K_2SO_4 . SO_3 \end{array}\right\}$
Pyrophosphoric acid . . .	$\left\{\begin{array}{l} H_4P_2O_7, \text{ or} \\ H_3PO_4 . HPO_3 \end{array}\right\}$

CONTRIBUTIONS TO THE HISTORY OF THE OPIUM ALKALOIDS.*

BY C. R. A. WRIGHT, D.SC.

Lecturer on Chemistry in St. Mary's Hospital Medical School.

Part III.

1. *Action of Hydriodic Acid on Codeia in Presence of Phosphorus.*

In Parts I. and II. of these researches the action of hydrobromic acid on codeia and its derivatives has been partially investigated; and as the action of this acid seems to be in some respects similar to, but in others different from that of hydrochloric acid, it appeared to be of interest to examine the action of hydriodic acid also.

Some preliminary experiments on this subject, made two or three years ago in conjunction with the late Dr. A. Matthiessen, showed that when codeia is boiled with a large excess of strong hydriodic acid, no appreciable quantity of methyl iodide is evolved even after some hours' treatment; a brown tarry mass containing much free iodine was produced, but at the time nothing fit for analysis was obtained from this; since then, Dr. Matthiessen and Mr. Burnside† have corroborated the non-formation of methyl iodide under these circumstances.

If, however, phosphorus be added simultaneously with the hydriodic acid, so as to prevent the accumulation of free iodine, methyl iodide is evolved at 100° and upwards in quantity close upon that required for the equation—

$$\underbrace{C_{18}H_{21}NO_3}_{\text{Codeia.}} + HI = CH_3I + \underbrace{C_{17}H_{19}NO_3}_{\text{Morphia.}}:$$

hitherto, however, no body of this latter formula has been isolated from the products of the reaction, the substances ultimately formed being derived from a base containing H_2 more than morphia.

The hydriodic acid was obtained, in the first instance, by the action of hydric sulphide on iodide and water; in the dilute acid thus got iodine was dissolved, and the whole digested at a very gentle heat with phosphorus, more iodine solution being added from time to time; finally, the whole was distilled several times from potassium iodide. A colourless acid of sp. gr. 1·7 to 1·75, and containing 50 to 55 per cent. of HI, was thus obtained, and preserved colourless by keeping a stick of phosphorus in the bottle. The codeia used in these experiments was part of a further supply most liberally presented by Messrs. Macfarlan, of Edinburgh.

On heating on the water-bath a mixture of 10 parts codeia, 30 to 50 of this acid, and 1 of phosphorus, the evolution of methyl iodide is noticed in a few minutes; simultaneously the liquid becomes brown, indicating the separation of free iodine; after two or three hours the brown colour disappears, and the evolution of methyl iodide ceases. If the liquid be heated to gentle ebullition, at first the same effects ensue, but more quickly; the resulting product, however, varies in composition, according to the temperature at which the reaction was effected.

In one experiment 55 grms. of codeia yielded by condensation 22·5 grms. of methyl iodide, the theoretical yield being 24·6 from crystallized codeia, $C_{18}H_{21}NO_3H_2O$; hence upwards of 90 per cent. of the theoretical yield was obtained. In order to prove the elimination of 1-18th part of the carbon in the form of methyl iodide, 4·3045 grms. of codeia, dried at 140° to 150° C., was heated to gentle ebullition with 30 grms. of 55 per cent. of hydriodic acid and about 2 of phosphorus; the vapours evolved were passed through a flask to condense aqueous vapour, and then through a combustion-tube filled with red-hot lead chromate, the CO_2 produced being absorbed in the usual way,—an aspirator being attached at the far end so as to create a diminished pressure throughout the apparatus, and thus guard against loss of methyl iodide vapour by leakage at any of the numerous corks and joints.* After three hours a current of pure oxygen was let through the apparatus to sweep out the last traces of methyl iodide vapour from the flasks, and ensure the perfect combustion of deposited carbonaceous particles.

4·3045 grms. codeia thus gave 0·617 grm. CO_2.

0·3720 grm. codeia, burnt in the usual way, gave 0·9830 CO_2.

	Found.	Calculated.
(A) Percentage of carbon evolved as CH_3I . .	3·91	4·013
(B) Percentage of carbon in codeia used . .	72·07	72·241
Ratio of A to B	$\frac{3·91}{72·07} = \frac{1}{18·4}$	$\frac{4·013}{72·241} = \frac{1}{18}$

In another experiment not carried to a complete conclusion, the CO_2 collected represented 3·7 per cent. of the codeia used.

The methyl iodide produced was found, after washing with water, drying over $CaCl_2$, and distillation, to be free from traces of dissolved phosphorus, to boil at 42° to 45° C., and to correspond in every respect with the ordinary methyl iodide.

If the reaction with hydriodic acid takes place on the water-bath, the resulting product appears to have the composition $C_{68}H_{86}I_2N_4O_{12}, 4HI$; but if the mixture be heated to gentle ebullition throughout, the temperature not being allowed to exceed 110° to 115° from loss of aqueous fluid by evaporation, the substance obtained contains the elements of two molecules of water less, $= C_{68}H_{82}I_2N_4O_{10}, 4HI$; whilst if the mixture be rapidly

* Read before the Royal Society, November 16, 1871.

† Proceedings of the Royal Society, vol. xix. p. 71.

* This device may be applied with advantage to the ordinary processes for combustion, blowing out of the tube as well as loss by traces of leakage being thus avoided.

boiled, so that by evaporation the boiling-point rises to 130° and upwards, the ultimate product contains less oxygen than this last body, being $C_{68}H_{82}I_2N_4O_6, 4HI$. These three formulæ might each be halved; but inasmuch as compounds containing not less than C_{68} have been got from these products by simple treatments, the higher formulæ are more probable.

All three substances are, while moist, colourless tars, drying at 100° to brittle waxy-looking masses, not fusing at 100° when perfectly dry; they are soluble in hot water, a decomposition being thereby produced; while moist they appear to absorb oxygen with avidity, rapidly becoming yellow or orange. They are also extremely hygroscopic, and from the high percentage of iodine contained, the ease with which they decompose on heating, and the difficulty combustible carbon left, their analysis is a matter of some considerable difficulty. From all these circumstances combined, the numbers obtained do not always accord quite as closely as might be expected in the case of crystalline and easily purified substances.

To obtain the compound $C_{68}H_{86}I_2N_4O_{12}, 4HI$, 10 parts of codeia, 30 of 55 per cent. hydriodic acid, and 1 of phosphorus may be heated on the water-bath for three to four hours, at the end of which time the evolution of methyl iodide has entirely ceased: by filtering the syrupy hot liquid through asbestos to separate particles of amorphous phosphorus and addition of a little water when cold, a colourless tar is precipitated, which soon sets to a hard brittle mass: this is broken up and thoroughly washed with water to separate the phosphorus acids produced simultaneously, and finally freed from moisture as far as possible by pressure between filter paper, and dried at 100°.

The same body may also be obtained by dissolving the original substance in slightly warm water, precipitating with sodium carbonate, and extraction of the mass thus thrown down with ether, and agitation of the first portions of the ether extract with hydriodic acid: the tar thus got is identical in all respects with the original substance. After drying at 100° the following numbers were obtained:—

(A) Prepared by the first method:—
0·3785 grm. gave 0·588 CO_2 and 0·173 H_2O.
0·359 grm. 0·2535 AgI.

(B) Prepared by ether process:—
0·357 grm. gave 0·5655 CO_2 and 0·165 H_2O.
0·2635 grm. gave 0·1895 AgI.

(C) Another specimen prepared by ether process:—
0·316 grm. gave 0·493 CO_2 and 0·135 H_2O.
0·2865 grm. gave 0·2025 AgI.

	Calculated.		Found. A.	B.	C.	Mean.
C_{68}	816	42·59	42·36	43·20	42·54	42·70
H_{90}	90	4·70	5·08	5·14	4·75	4·99
I_6	762	39·77	38·16	38·87	38·19	38·41
N_4	56	2·92				
O_{12}	192	10·02				
	1916	100·00				

$C_{68}H_{86}I_2N_4O_{12}, 4HI$.

The falling short in the percentage of iodine found in these specimens is readily accounted for by the action of the water which necessarily adheres to the tarry product got by either of the above processes; it will be subsequently shown that by the action of water on this body the elements of HI are removed from it.

This compound is apparently formed by the reaction—

$$\underbrace{4(C_{18}H_{21}NO_3, HI)}_{\text{Codeia hydriodate.}} + 14HI =$$
$$= 4CH_3I + I_8 + \underbrace{C_{68}H_{86}I_2N_4O_{12}, 4HI.}_{\text{New body.}}$$

* All combustions given in this paper were made with lead chromate and oxygen; and the iodine determinations by boiling with nitric acid and silver nitrate.

The iodine thus set free is, of course, reconverted into HI by the action of the phosphorus, a mixture of phosphorous and phosphoric acids being thereby produced. The reaction,

$$3I_2 + P_2 + 6H_2O = 2H_3PO_3 + 6HI,$$

requires for 50 grms. of codeia 3·45 grms. of phosphorus to be converted into phosphorous acid; whilst the equation $5I_2 + P_2 + 8H_2O = 2H_3PO_4 + 8HI$ requires 2·07 grms. to be converted into phosphoric acid. In one experiment 2·8 grms. of phosphorus, as nearly as could be estimated, were found to have become converted into the mixture of the two acids, 50 grms. of codeia having been employed.

On attempting to procure the free base $C_{68}H_{86}I_2N_4O_{12}$ from the hydriodate got as above, by precipitation with sodium carbonate, a snow-white mass was obtained containing, besides a small quantity of the desired base (soluble in ether), a large quantity of two other bases derived from this one (but sparingly soluble in ether). The description of the products thus got will be given in a subsequent section.

By treating codeia with hydriodic acid and phosphorus as above described, but at a temperature of gentle ebullition, not rising above 115°, a product is got on filtration through asbestos and precipitation by water containing apparently $2H_2O$ less than the preceding compound. Dried at 100°.

0·302 grm. gave 0·475 CO_2 and 0·135 H_2O.
0·248 grms. gave 0·1845 AgI.

	Calculated.		Found.
C_{68}	816	43·40	42·89
H_{86}	86	4·58	4·97
I_6	762	40·53	40·20
N_4	56	2·98	
O_{10}	160	8·51	
$C_{68}H_{82}I_2N_4O_{10}, 4HI$	1880	100·00	

Hence this substance is formed from the preceding one by the reaction—

$$C_{68}H_{86}I_2N_4O_{12}, 4HI = 2H_2O + C_{68}H_{82}I_2N_4O_{10}, 4HI.$$

If codeia, hydriodic acid (3 to 5 parts), and phosphorus be heated to rapid ebullition, so that most of the aqueous portion distils off along with the CH_3I formed, the boiling-point gradually rises to 130° or a little above, at which temperature the colourless liquid begins again to become slightly brown; on precipitation of the filtered product with water, etc., as before, the following numbers were obtained after drying at 100°:—

Specimen A. 0·3575 grm. gave 0·589 CO_2 and 0·168 H_2O.
0·402 „ 0·307 AgI.
Specimen B. 0·358 „ 0·583 CO_2 and 0·164 H_2O.
0·369 „ 0·2815 AgI.
Specimen C. 0·3855 „ 6·635 CO_2 and 0·178 H_2O.
3·363 „ 0·276 AgI.

	Calculated.		Found. A.	B.	C.	Mean.
C_{68}	816	44·93	44·92	44·41	44·91	44·75
H_{86}	86	4·73	5·22	5·09	5·13	5·15
I_6	762	41·96	41·27	41·23	41·09	41·20
N_4	56	3·09				
O_6	96	5·29				
	1816	100·00				

$C_{68}H_{82}I_2N_4O_6, 4HI$

Hence this substance is formed from the preceding one by the reaction—

$$C_{68}H_{82}I_2N_4O_{10}, 4HI + 8HI =$$
$$= I_8 + 4H_2O + C_{68}H_{82}I_2N_4O_6, 4HI.$$

(*To be continued.*)

NOTES ON CARBOLIC ACID.

BY WILLIAM C. BAKES.

Few substances have acquired greater popularity, and given such general satisfaction as carbolic acid. For a long time it was exclusively used by the medical profession, but the public having heard of its antiseptic and disinfectant properties have adopted it in various forms as one of their household requisites.

Its use as a remedial agent dates from 1859, when M. Le Beuf, of Bayonne, France, employed the then crude carbolic acid in the form of a saponaceous emulsion. He assisted in the work of M. Lemaire, of Paris, who has made it the foundation of a laborious research. The two investigators sent to the Academy of Medicine a paper on the value of the emulsion as an application to gangrenous ulcers. M. Lemaire continued his investigation, and published an elaborate treatise in 1863, in which he narrated a series of experiments in which carbolic acid was employed as a means for the destruction of low forms of animal and vegetable life, as a preventive of fermentation and putrefaction, as an external application in cases of ulcerating and suppurating surfaces, as well as an internal remedy in zymotic and other diseases. While carbolic acid was attracting attention as a disinfecting agent, experiments were being made as to its use in the arts. Laurent, in 1841, after a series of investigations, produced picric acid by the action of nitric acid upon carbolic acid. Picric acid is used as a yellow dye, and from it are derived picramic acid and isopurpurate of ammonium, yielding rich brown and garnet hues.

In 1865 Professor Lister began the use of carbolic acid in surgical cases attended with suppuration, and gave the result of his investigations in several communications to the *Lancet*, in the March and July numbers of 1867.

To the pharmaceutist the preparations of carbolic acid are of some interest, and demands are often made for the various combinations without any definite formula.

A valuable work of 356 pages has recently been published, entitled 'The Antiseptic System: a Treatise on Carbolic Acid and its Compounds,' etc., by A. E. Sansom, M.D., of London, which contains much useful information, relating not only to the chemistry of carbolic acid, but to its general employment in medicine. In the appendix a series of formulæ are given as follows:—

1. *Liquefied Carbolic Acid.—A.* Calvert's purest (No. 1) acid, liquefied by placing the bottle containing it in hot water, 9 parts; water, 1 part. Mix well.—*Calvert.*

B. Pure carbolic acid, 15 parts; alcohol, 1 part. Mix well. This keeps fluid at all ordinary temperatures.—*Sansom.*

For many purposes, especially for dispensing, it is convenient to keep the acid in a liquid form, otherwise the crystals must be melted by heat each time that the acid is employed.

2. *Solution of Carbolic Acid in Water.*—To obtain uniform solution, it is better to slake the carbolic acid with four times its bulk of hot water, and then to add a sufficiency of cold water; or the carbolic acid may be first mingled with alcohol, which causes more ready solubility, before the addition of cold water. Water will not dissolve more than one-twentieth of its bulk of carbolic acid.

3. *Alcoholized Carbolic Acid* (Acide Phénique Alcoolisé)—Alcohol (90°), crystallized carbolic acid, equal parts. Mix, and keep in a well-stoppered bottle. Used for making carbolized solutions, etc. Being more fluid than carbolic acid, it more readily penetrates the tissues. Useful in poisoned wounds, for application to smallpox pustules, etc.—*Lemaire.*

4. *Etherized Carbolic Acid* (Ether Phéniqué).—Sulphuric ether, 100 parts; carbolic acid, 1 part. Used for insufflation in catarrh of Eustachian tube.—*Lemaire.*

5. *Carbolized Vinegar* (Vinaigre Phéniqué).—Ordinary vinegar, 4 parts; carbolic acid, 1 part. Mix. For use, instead of aromatic vinegar, as a disinfectant, etc.—*Quesneville.*

6. *Glycerinum Acidi Carbolici.*—Carbolic acid, 1 ounce; glycerine, 4 fluid ounces. Rub them together in a mortar until the acid is dissolved.—*British Pharmacopœia.*

7. *Carbolized Glycerine* (Glycerine Phéniquée).—Pure glycerine, 100 parts; carbolic acid, 1 part. Mix. For impetigo, chronic eczema, lichen, prurigo and pemphigus.—*Lemaire.*

8. *Syrup of Carbolic Acid* (Sirop d'Acide Phénique).—Simple syrup, 100 parts; carbolic acid, crystallized, 1 part. Mix.—*Chaumelle.*

9. *Carbolic Acid Liniment.*—For counter-irritation.

A. Alcohol, 50 parts; carbolic acid, 1 part. Mix.—*Lemaire.*

B. Olive oil, 7 parts; carbolic acid, 1 part. Mix.—*Sansom.*

10. *Compound Disinfectant Solution.*—Water, 1000 parts; carbolic acid, 10 parts; sulphate of zinc or sulphate of iron, 3 parts. Mix. Carbolic acid has no chemical action on sulphuretted hydrogen or carbonate of ammonium. When it is employed alone as a disinfectant, deodorization does not take place until the gases have disappeared by diffusion. The sulphates change the sulphuretted hydrogen into sulphides, and the carbonate of ammonium into metallic carbonate and ammonium sulphate,—all inodorous compounds.—*Lemaire.*

11. *The Süvern Deodorant.*—Good quicklime, $1\frac{1}{2}$ bushels, put in a cask, slaked, and well stirred; coal tar, 10 lb. Mix thoroughly, then add magnesium chloride, 15 lb., dissolved in hot water. Mix again, and add hot water until the mass is liquid enough to drop slowly from a stick plunged into it, and then withdrawn. The magnesium chloride forms deliquescent calcium chloride. Magnesia being liberated, this prevents caking and adherence to pipes, which is a defect when lime alone is used.—*Parkes.*

12. *Carbolized Earth* (Terre Coaltarée).—Common loam, passed through a sieve, 100 parts; coal tar, 2 parts. Mix intimately. Disinfectant for crops and for destruction of noxious insects.—*Lemaire.*

13. *Solution of Carbolic Acid for the Toilette.*—Crystallized carbolic acid, 10 parts; essence of millefleur, 1 part; tincture of *Quillaya saponaria*, 50 parts; water, 1000 parts. Mix. The saponin replaces soap with advantage. The above should be employed, diluted with ten times its bulk of water, for disinfecting the skin, for washing the hands after any risk of contagion or inoculation, etc.—*Lemaire.*

14. *Tincture of Saponin*, as used in the foregoing preparation, is thus made: Bark of *Quillaya saponaria*, 1 part; alcohol (90°), 4 parts. Heat to ebullition, and filter.—*Le Beuf.*

15. *Carbolized Water for the Teeth.*—Water, 1000 parts; essence of meat, 2 parts; tincture of saponin, 50 parts; pure carbolic acid, 10 parts. Mix. A dessertspoonful in a quarter of a tumblerful of water, serves as an excellent preparation for cleansing and preserving the teeth.

16. *Carbolized Ointment.*—Purified lard, 100 parts; carbolic acid, 1 part. Mix. Considered of some service in skin affections; but, modified as it is by the fat, it cannot replace the aqueous solution of carbolic acid.—*Lemaire.*

17. *Carbolized Amylaceous Ointment.*—Pure starch, 3 parts; hot water, 20 parts. Mix, in the ordinary way (the starch being made first into a paste with cold water, and then hot water added), to a stiff consistence; then add olive oil 1 part, glycerine 3 parts, carbolic acid 1 part, and thoroughly mix in a mortar. When cool this is a soft jelly, which can easily be applied as ordinary ointment. It is much more efficacious than one the basis of which is entirely fat, and it is an agreeably cool application.—*Sansom.*

18. *Carbolized Oil.—A.* Crystallized carbolic acid, 1 part; boiled linseed oil, 4 parts. Dissolve.—*Lister.*

B. Pure carbolic acid, 1 part; olive oil, 6 parts. Olive oil is better than linseed oil as a vehicle, as the latter is more prone to oxidation.—*Calvert.*

19. *Carbolized Putty.*—Carbolized oil, about 6 tablespoonfuls; common whiting (chalk), sufficient to make a firm paste.—*Lister.*

20. *Antiseptic Lead Plaster.*—Olive oil, 12 parts (by measure); litharge (finely ground), 12 parts (by weight); beeswax, 3 parts (by weight); crystallized carbolic acid, 2½ parts (by weight). Heat half the olive oil over a slow fire; then add the litharge gradually, stirring continually until the mass becomes thick or a little stiff; then add the other half of the oil, stirring, as before, until it becomes thick again. Then add the wax gradually till the liquid again thickens. Remove from the fire and add the acid, stirring briskly till thoroughly mixed. Cover up close, and set aside to allow all the residual litharge to settle; then pour off the fluid, and spread upon calico to the proper thickness. The plaster made in this way can be spread by machine and kept rolled in stock, and if in a well-fitting tin canister will retain its virtues for any length of time.—*Lister.*

21. *Antiseptic Lac Plaster.*—Shellac, 3 parts; crystallized carbolic acid, 1 part. Heat the lac with about one-third of the carbolic acid over a slow fire till the lac is completely melted; then remove from the fire and add the remainder of the acid, and stir briskly till the ingredients are thoroughly mixed. Strain through muslin, and pour into the machine for spreading plaster, and when the liquid has thickened by cooling to a degree ascertained by experience, spread to the thickness of about one-fiftieth of an inch.

Afterwards, brush over the surface of the plaster lightly with a solution of gutta percha in about 30 parts of bisulphide of carbon. When the sulphide has all evaporated, the plaster may be piled in suitable lengths in a tin box without adhering, or rolled up and kept in a canister.—*Lister.*

22. *Antiseptic Cere-cloth.*—Cloth or thin calico is saturated with cerate (made after the following formula), by simply drawing a portion through it while in a fluid state, or in pieces of any length and width, by rolling, by means of a machine, the calico over cylinders containing cold water, as fast as it has taken up the cerate.

A. Strongest Cerate.—Calvert's pure carbolic acid, liquefied, 3 fluid ounces; olive oil (coloured red with alkanet root to distinguish the cerate), 1½ fluid ounces; yellow wax, liquefied, 1½ fluid ounces; paraffin, liquefied, 6 fluid ounces. Mix.

B. Medium Strength.—Pure carbolic acid, 2 fluid ounces; olive oil, 2½ fluid ounces; yellow wax, 2½ fluid ounces; paraffin, 5 fluid ounces. Mix.

C. Weakest.—Pure carbolic acid, 1½ fluid ounce; olive oil, 1 fluid ounce and 6 drachms; white wax, 1 fluid ounce and 6 drachms; paraffin, 7 fluid ounces. Mix.

23. *Antiseptic Muslin Gauze.*—Paraffin, 16 parts; resin, 4 parts; crystallized carbolic acid, 1 part. Melt together. Cheap muslin gauze is dipped in the melted mass and well wrung or pressed while hot. A good substitute for oakum as an antiseptic covering for wounds, unirritating to the most sensitive skin, highly retentive of the acid, and almost destitute of odour. It should, when used, be folded in about eight layers. It loses the paraffin and resin when washed in boiling-water, so the same gauze may be used repeatedly.—*Lister.*

24. *Protective against Local Irritating Effects of Carbolic Acid in Antiseptic Dressings.*—Varnish oiled silk on both surfaces with copal varnish. When dry, brush over with a mixture of starch and dextrin, to give it a film of material soluble in water, so that it becomes uniformly moistened when dipped into antiseptic lotion. When not at hand, common oiled silk may be used as a substitute for it, if smeared with an oily solution of carbolic acid, and used in two layers, to make up for its inferior inefficiency.—*Lister.*

25. *Antiseptic Adhesive Plaster.*—Dip ordinary strapping in hot solution of carbolic acid, made by mixing 1 part of 1 to 20 lotion with 2 parts of boiling water. Will adhere to a moist skin, so that it may be employed under spray when advisable.—*Lister.*

26. *Carbolized Powders.*—Pure liquefied carbolic acid, 5 parts; alcohol, 5 parts. Mix. Add by degrees 100 parts of one of the following powders: Lycopodium, starch, charcoal, plaster of Paris. The proportions of carbolic acid can be increased or decreased as desired.—*Sansom.*

27. *Antiseptic Catgut Ligature.*—Catgut of the thickness required is to be kept steeped in carbolized olive oil (1 pint in 5), with a very small quantity of water diffused throughout it.—*Lister.*

28. *Aceto-Carbolic Solution for Tinea and Scabies.*—Acetic acid (pyroligneous), 8°, 20 parts; pure carbolic acid, 5 parts; water, 75 parts. Mix the two acids and add the water. The acetic acid favours penetration through the epidermis. For tinea, apply the liquid once a day over the diseased parts by means of a brush. For scabies, sponge all the parts. The clothes, etc., of the affected individual should also be treated with the liquid.—*Lemaire.*

29. *Carbolized Gargle for Diphtheria, Tonsillitis, etc.*—Carbolic acid, 20 minims; acetic acid, ½ drachm; honey, 2 fluid ounces; tincture of myrrh, 2 fluid drachms; water, 6 fluid ounces. The carbolic and acetic acids to be well shaken together before the other ingredients are added.—*Charles Sedgwick, jun.*

30. *Carbolized Mixture for Zymotic Diseases.*—Carbolic acid, acetic acid, of each 1 drachm to 1½ fluid drachm; tincture of opium, 1 fluid drachm; chloric ether, 1 fluid drachm; water, 8 fluid ounces. A tablespoonful every four hours until the fever has subsided.—*Dr. Alex. Keith.*

31. *Mixture of Quinine and Sulpho-Carbolate of Sodium.* Quinine sulphate, 1 grain; sulphuric acid, 5 minims. Dissolve, and add to the solution of sodium, sulphocarbolate, 20 grains; in water, 1 fluid ounce.—*Author.*
—*American Journal of Pharmacy.*

THE POLLUTION OF RIVERS.

(*Concluded from page* 428.)

The Commissioners have not rested content with publishing an account of the evil; they have also endeavoured to point out how it might be remedied, and that inexpensively, and sometimes with actual profit. The utilization of the waste liquors of manufacturers appears to admit, in some cases, of being practically carried out. This will be best shown by giving some particulars as to their composition.

Thus, a sample of the waste water from one of the vats in Messrs. Bright and Co.'s carpet factory at Rochdale, contained a large proportion of nitrogenous organic matter and ammonia, sufficient to render it valuable for irrigation, as seen from the following analysis:—

100,000 parts contained:—

Total solid matters in solution	103·10
Organic carbon	14·924
Organic nitrogen	·925
Ammonia	1·144
Total combined nitrogen	1·867
Arsenic	·012

The following is an estimate of waste stuff from the weekly manufacture of rather more than 500 pieces of broad cloth in the Stroud district:—Grease and dirt (removed from raw wool), 12 tons; urine, 14 tons; oil in carding, 2 tons; glue, 10 cwt.; pig's dung, 2½ tons; pig's blood, 2¼ tons; urine (collected from house to house), 25 tons; soda, 1 ton; soap, 2½ tons; Fuller's earth, 2½ tons; dye stuffs, 20 tons; alum, 2 tons.

The composition of the waste liquor from flannel washing proves to be, in the case examined, a most valuable manure, one hundredweight of it being worth, for this purpose, more than one ton of London sewage. The discharge of such liquors into rivers is a reckless waste. The following analysis of a sample of wool-suds (the liquid in which raw wool has been scoured) is an illustration of both the very noxious character of this liquid, and the great value which it possesses for agricultural purposes, as evidenced by the very high proportion of total combined nitrogen which it contains:—

100,000 parts of this liquid gave:—

Total solid matters in solution	1099·4
Organic carbon	132·48
Organic nitrogen	9·88
Ammonia	54·61
Total combined nitrogen	54·85
Mineral suspended matters	870·95
Organic suspended matters	2611·65
Arsenic	Traces.

In dealing with the subject of the remedies to be applied, the Commissioners call attention to the importance of keeping the very foul portion of the waste liquids separate from those of comparatively larger volume, but possessing so slight a polluting character as to render them admissible into watercourses without injury.

Such a separation of polluting from comparatively innocuous liquids would present no formidable difficulties to the manufacturer, whilst it would greatly facilitate the purification of the really noxious portion of the discharges, inasmuch as the volume of polluting water requiring remedial treatment would be immensely reduced. Moreover these liquids, both on account of their greater concentration and by reason of their containing a larger proportion of combined nitrogen, have a considerable manure value, while the extraction of highly polluting matter, as for instance the oil from the soapsuds obtained in the washing both of the raw and manufactured material, yields, in some cases, a handsome profit. Partly on this account, and partly because of proceedings in equity or of actions at law, instances are not wanting of more or less successful attempts at the purification of these refuse liquors.

The great concentration and consequent small bulk of the more highly polluting liquids produced in the woollen manufacture, also render feasible a method of disposing of them which would be utterly impracticable in the case of more dilute and voluminous foul waters, namely, by evaporation. Under even moderately favourable circumstances 1 lb. of coal will evaporate one gallon of water, consequently, in cases where the volume of the highly polluting liquids is known, the cost of thus disposing of these liquids is easily ascertained. In a case where the aggregate amount of such polluting liquor daily discharged is 240 gallons, the daily expenditure of 240 lb. of coal would entirely prevent such pollution. At the somewhat extravagant price, in many districts where this occurs, of 15*s.* per ton of coal, this most effective and simple mode of purification, or rather prevention, would cost rather less than 1*s.* 8*d.* per working day.

The method of evaporation is not recommended exclusively, however, but as an adjunct to other modes of purification, and especially in utilizing the waste heat from furnaces.

In the purification of refuse liquids by chemical agents, the principal operation at present conducted is the recovery of grease from the soapsuds produced in the washing operations of the woollen manufacture. But the Commissioners report that it is carried out in a very crude and imperfect manner. They consider that there are many well-known processes in technical chemistry which point to a much more effectual mode of separating these oily matters. A method suggested by them is, that after the addition of slight excess of sulphuric acid, the liquor should be briskly agitated with bisulphide of carbon, which would dissolve out the diffused minute oily globules in the form of an emulsion that would rapidly subside to the bottom of the vat, whence it could be drawn off into a still, and the bisulphide of carbon volatilized by a steam heat, condensed, and recovered for further use. At present the grease-extracting process is carried out only with a view to profit, and the so-called "purified" effluent water proved to be in all cases a most filthy and polluting liquid.

But the Commissioners consider that the best and most profitable mode of cleansing the foul liquids of woollen factories will be found in their application to land, and that their utility would be augmented by previously mixing them with several times their volume of town sewage. They also report favourably upon a system of intermittent filtration through porous earth, described in a former report, for the purification of sewage and the waste liquors from calico printworks and woollen factories.

After an exhaustive review of the information they had been able to collect, the Commissioners recommend (1.) That the casting of solid matters of whatever kind into rivers and running waters, or the placing where it is liable to be washed into the river by floods, be absolutely prohibited under adequate penalties. (2.) That the discharge of polluting liquids, which transgress certain limits, into any river or stream be prohibited under adequate penalties, a reasonable time being allowed for the execution of the necessary works for purification. (3.) That all rivers and streams in England be placed under the superintendence of a central authority or board, to be composed of not more than three persons, who shall be duly qualified to deal with all questions connected with the pollution of water and with water supply. (4.) That power be given to this board to inspect manufactories, reservoirs, sewerage, and other similar works; and to cause to be constructed, at the expense of the owners of the same, whether corporate or private, any necessary purifying apparatus, in case the said owners neglect or refuse to provide such apparatus for themselves. (5.) That, subject to proper regulations to prevent abuse, additional powers be given to corporations, local boards, manufacturers and others, upon compensation being made, to take land compulsorily, under "provisional order," for the purpose of cleansing sewage or other foul liquids. (6.) That it be the duty of the central board to exercise a surveillance over both the quality and quantity of the water supply of towns. (7.) That it be the duty of this central board to investigate all schemes for water supply; and also all proposals for public works connected with river conservancy.

It is also recommended that the following liquids should be deemed polluting and inadmissible into any stream:—

(*a.*) Any liquid containing, *in suspension*, more than 3 parts by weight of dry mineral matter, or 1 part by weight of dry organic matter in 100,000 parts by weight of the liquid.

(*b.*) Any liquid containing, *in solution*, more than 2 parts by weight of organic carbon, or ·3 part by weight of organic nitrogen, in 100,000 parts by weight.

(*c.*) Any liquid which shall exhibit by daylight a distinct colour when a stratum of it one inch deep is placed in a white porcelain or earthenware vessel.

(*d.*) Any liquid which contains, *in solution*, in 100,000 parts by weight, more than 2 parts by weight of any metal except calcium, magnesium, potassium and sodium.

(*e.*) Any liquid which, in 100,000 parts by weight, contains, *whether in solution or suspension*, in chemical combination or otherwise, more than ·05 part by weight of metallic arsenic.

(*f.*) Any liquid which, after acidification with sulphuric acid, contains, in 100,000 parts by weight, more than 1 part by weight of free chlorine.

(*g.*) Any liquid which contains, in 100,000 parts by weight, more than 1 part by weight of sulphur, in the condition either of sulphuretted hydrogen or of a soluble sulphuret.

(*h.*) Any liquid possessing an acidity greater than that which is produced by adding 2 parts by weight of real muriatic acid to 1000 parts by weight of distilled water.

(*i.*) Any liquid possessing an alkalinity greater than that produced by adding 1 part by weight of dry caustic soda to 1000 parts by weight of distilled water.

CREASOTE PILLS.

The following formulæ for the preparation of creasote pills are taken from the *Journal de Pharmacie et de Chimie*:—

Creasote	1 drop.
Soap Powder	0·25 gram.
Crumb of Bread	0·20 „
Lycopodium	0·05 „

For six pills. The soap powder forms with the creasote a homogeneous mass, to which the crumb of bread gives plasticity.

Or, better still—

Creasote	3 drops.
Crumb of Bread	0·60 gram.
Lycopodium	0·06 „
Mucilage of Gum Tragacanth	q. s.

For six pills, each of which will contain half a drop of the active constituent. In these proportions the manipulation is easy, and the appearance leaves nothing to desire.

IMPROVED STREET SURFACES.

The improved appearance of some of the leading City thoroughfares must be pleasing to the sight of sanguine sanitarians. The Poultry pure, Cheapside cleanly, Moorgate Street, Old Broad Street, London Wall muddy no more, and Lombard Street immaculate and free from dirt as the proverbial China orange, against which it has been so often pitted.

Asphalte and 'squeegee' have accomplished these desirable results, with the aid of the street orderly system introduced by Mr. Charles Cochrane twenty-five years ago, but which has made but little progress beyond the City walls, notwithstanding the sanitary advantages derivable from it.

Who would be 'jolted over the stones' if a smooth and noiseless road-surface was available? Stunned, bewildered and deafened by the din of the traffic in a granite-paved street, with what a sense of relief the pedestrian seeks refuge on asphalt! Merchants, bankers and tradesmen petition for peace and repaving, their prayers being as rapidly granted by the Commissioners of Sewers as economical considerations will allow.

Impermeable road surfaces of this nature present so many obvious advantages that it is to be hoped they may soon be largely extended through our Metropolis and provincial towns. The few drawbacks occasionally evident are not insurmountable; the slipperiness of surface apparent at certain times will, no doubt, be obviated as further experience is gained. The system is at present in its infancy, and the material used capable of considerable improvement; although up to the present time, notwithstanding the fact that twenty-seven asphalt paving schemes have recently been introduced, the Val de Travers and Limmer pavements are as yet unrivalled. —*Milk Journal.*

HULL CHEMISTS' ASSOCIATION ANNUAL SUPPER.

The Annual Supper of this Association was held on Wednesday evening, December 6th. Between forty and fifty gentlemen were present; the chair was occupied by Mr. Atkinson Pickering.

In replying to the toast of "Success to the Hull Chemists' Association," the Chairman alluded to the active part taken by the Association in opposing the Pharmacy Bill introduced during last session of Parliament. He considered that chemists and druggists, as a body, should make such rules and regulations for the management and governance of their own business as very varying circumstances required. One great object of the Chemists' Association was the establishment of a School of Pharmacy, and the security sought for was more likely to be obtained through such means than through any code of laws that could be devised by the Privy Council.

The toast of "The Medical Profession" having been drunk, Mr. J. H. Gibson expressed the pleasure it afforded him to visit the Society on such occasions. When first he came amongst them, there was a feeling almost of suspicion, at all events the profession had not the real confidence in the chemists and druggists which now existed between the two bodies. But by the organization that had taken place and the increased qualifications required from chemists and druggists before commencing business, their position had been much improved; and he believed that the feeling of confidence between them and the medical profession would grow and be an advantage to both. Some years ago it was a practice, and he must say a bad one, for chemists to prescribe over the counter. Even now, in cases of emergency, this might have to be done; he, therefore, hailed with satisfaction the advance that chemists and druggists had made in their knowledge of the virtues and properties of drugs.

SUNDERLAND CHEMISTS' ASSOCIATION ANNUAL DINNER.

The Annual Dinner of the members of this Association was held at the Crown and Sceptre Hotel, on Wednesday, December 6th. About thirty gentlemen were present. Mr. Alderman Thompson, President of the Society, occupied the chair. After the usual loyal toasts, Mr. J. J. Nicholson proposed "The Medical Profession," coupling the toast with the names of Dr. Abrath and Mr. George Welford, jun.

Dr. Abrath said he thanked them sincerely for the honour they had conferred on the medical profession. It afforded him great pleasure to meet the dispensing chemists; and he regretted that there was not more unity between the dispensing chemists and the medical practitioners of this town. He would like to see both professions on the same footing as they were in France and Germany. Here one robbed the other. Medical men had no right to dispense, and chemists had no right to prescribe. The law required to be altered, and if it was, he believed it would be for the benefit of both parties. He then alluded to the adulteration of drugs, and said that in France and Germany they were examined by Government inspectors, and the public were thus protected. It was the wholesale dealer who adulterated; and until this country reformed her laws with regard to drugs and medical men and dispensing chemists, she would remain the country of quackery.

Mr. Welford, jun., also replied, and said he agreed with Dr. Abrath as to each profession keeping to their own special sphere of labour.

The Chairman said he had spoken on this subject eighteen months ago, when, in his capacity of chief magistrate, he had dined with the medical gentlemen of the town, and he had at that time given expression to an opinion that there should be only one class of dispensers, and that they should be apart from the medical profession.

Mr. Turnbull gave "The Pharmaceutical Society of Great Britain," which was responded to by Mr. Sharp, who remarked that its members need never expect to secure the confidence of the medical profession, unless they took care to keep abreast of the intelligence of the day. He dilated upon the labours of the founder of the Society—Jacob Bell,—and the debt of gratitude that all classes of chemists and druggists owed to him and his fellow-workers.

The Pharmaceutical Journal.

SATURDAY, DECEMBER 16, 1871.

Communications for this Journal, and books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE END OF THE BETTS SUITS.

A SHORT letter in our correspondence columns last week, from the solicitors who had charge of the defence to the Betts Suits, stating that Mr. BETTS had applied to have his Bill in the case *Betts* v. *Rimmel* dismissed, the costs to be paid by himself, records what is probably the last stage in this long and vexatious litigation. As this case and the twin case of *Betts* v. *Wilmot* at one time created considerable excitement among pharmaceutists, it will not be out of place to accompany this last act of the drama with a few remarks upon this glaring instance of the abuses possible in the present state of the law of patents.

The details of this dispute have so often been referred to in this Journal, that there is no necessity to repeat them here. The broad facts are that we have seen a patentee attacking a manufacturer for an alleged infringement of his patent,—the manufacturer not having made the article nor having a reliable test for distinguishing a capsule coated with tin by heat from one coated with tin by pressure; and even the patentee himself acknowledging that he could not tell one from the other.

Further, the patentee, not satisfied with getting his pound of flesh from the innocent manufacturer, pounced at the same time upon the customers of the latter, they being, if possible, still more blameless, and so sought his remedy from two sources.

But, fortunately, by dint of great exertions on the part of the defendants, the patentee was ignominiously defeated. He was forced to confess that he himself supplied the incriminated articles, which were made at his own house in Paris and sent by him to those who nearly became his victims.

And now the end of it all is, that the patentee simply withdraws from the prosecution, paying only the taxed costs, and justice is satisfied! But what is to compensate honest tradesmen for six years' anxiety from such wanton attacks? Why should one man have a right causelessly to inflict on another such losses in time, money and reputation?

We are glad to remember that the evil has been mitigated to some extent by the spirited and united manner in which the members of the trade concerned met the attack. The expenses of such litigation are very heavy,—we trust that, insatiable as Mr. BETTS appears to be, he will now be satisfied with his share of them,—and few tradesmen would have been prepared to incur the loss necessarily following even a successful defence. But had a system of compromise been generally carried out, the appetite no doubt would have been indefinitely sharpened by that which it fed upon. We, therefore, think that we may congratulate the defendants and the Defence Committee that—the necessity having arisen—the time and money employed by them have not been altogether thrown away.

PHARMACEUTICAL ETHICS IN NEW YORK.

AT a meeting of the New York College of Pharmacy on the 19th October, a "Code of Ethics" that had been drawn up was discussed and adopted. The greater part of this code is doubtless in accord with what is approved and carried into practice by most respectable pharmacists in this country, but we reproduce it for the purpose of illustrating the principles upon which our New York brethren aspire to have all pharmaceutical dealings in their city to be based, and the steps they are prepared to take to secure that object.

Preamble.—The members of the College of Pharmacy of the City of New York, considering it necessary that some mutual understanding should exist in regard to the moral principles guiding them in their profession, hereby agree upon the following Code of Ethics:—

1. We accept the U. S. Pharmacopœia as our standard and guide for all officinal preparations, and recognize a variance from its rules only in exceptional cases, where sufficient authority has proved some other process more reliable to attain the same end.

2. Although not a legitimate part of our business, custom and the necessity of the times warrant us in keeping on hand the patent medicines of the day; yet we earnestly recommend the propriety of discouraging their employment when called upon for an opinion of their merits.

3. We discountenance all secret formulæ between physicians and pharmacists, and consider it our duty to communicate such to each other when required.

4. We distinctly repudiate the practice of allowing physicians a percentage on their prescriptions; and we agree not to have a secret understanding with physicians to the pecuniary detriment of the public.

5. We will endeavour, as far as lies in our power, to refrain from compromising the professional reputation of physicians, and we expect the same comity from them.

6. Since the professional training of the pharmacist does not include those branches which enable the physician to diagnose and treat disease, we should, in all practicable cases, decline to give medical advice, and refer the applicant to a regular physician.

7. The growing demands of the age require that those who follow the profession of pharmacy should be educated up to a higher standard. Therefore, we consider it our duty, individually and collectively, to encourage the advancement of knowledge in our profession generally, and particularly by stimulating our assistants to attend the lectures of the College, and by aiding and assisting them to do so.

8. Considering it expedient that some rule be adopted to enforce the provisions of our code, we hereby agree,

if any just cause of complaint be found against a member of this College of having violated the rules or the spirit of our Association, to bring the case before a special or the next general meeting of the College, when the accused, after being heard in his own defence, may be expelled by a two-thirds vote.

THE CHICAGO COLLEGE FUND.

We are glad to be enabled to say that already the response to the appeal on behalf of the Chicago School of Pharmacy has been very favourable. The Committee has just issued a preliminary circular, and we purpose announcing the resulting subscriptions in our issue for next week.

We are informed by Professor Attfield that Dr. J. L. Soubeiran has written that he and his colleagues at the College of Pharmacy at Paris desire to contribute to the Fund, and that he will shortly forward a case of books to London for that purpose.

In consequence of the illness of H.R.H. the Prince of Wales, the Royal Society and the Society of Arts will not hold meetings next week. Mr. Collins's lecture on Economic Botany before the latter Society will be therefore postponed.

It is announced that the Great Exhibition of Arts, Manufactures and Science, at Moscow, will be opened on the 11th of June, 1872. The applications of persons desiring to become exhibitors must be made to the Committee of the Exhibition in Moscow before the 12th of January, 1872.

At a special meeting of the Board of Trustees of the Philadelphia College of Pharmacy, it was resolved that, should it be found impracticable to resume the lectures at the Chicago College of Pharmacy during the coming winter, matriculation tickets, and such lecture tickets as they may have paid for should be offered to the matriculants of the Chicago College, free of charge, for the present session.

In connection with the Philadelphia College also, a movement was recently set on foot to obtain the earlier closing of dispensing stores than heretofore. After several meetings and canvassing the city, the pharmacists of Philadelphia have resolved to close in future at 10 P.M., and a circular has been issued soliciting the co-operation of the public.

A decision having been recently obtained by the Parisian pharmaciens of the first class, to the effect that pharmaciens of the second class could not carry on business in Paris although holding diplomas granted by the Minister of Public Instruction upon the certificates of competency accorded by the professors and fellows of the École Supérieure de Pharmacie at Paris, an appeal was carried to the Court of Appeal of that city. The Court decided in favour of the Appellants, relieving them from the damages that had been pronounced against them in the lower court, and condemning the pharmaciens of the first class in the costs of the suit. It is stated that the pharmaciens of the first class intend to appeal to a higher court.

Provincial Transactions.

MANCHESTER CHEMISTS AND DRUGGISTS' ASSOCIATION.

An ordinary Monthly Meeting was held in the Memorial Hall, Albert Square, on Friday evening, December 1st; Mr. George S. Woolley in the chair.

Professor W. C. Williamson, F.R.S., delivered a very interesting lecture on "The Natural History of the Mineral Substances used in Medicine." The structure and probable mode of formation of various rocks, mineral veins, etc. were explained, after which, the Professor, aided by a splendid collection of mineralogical specimens, described the sources of the metals used in medicine. The attendance of associates was much larger than usual, and the lecture was listened to with evident pleasure and interest.

HALIFAX CHEMISTS AND DRUGGISTS' ASSOCIATION.

The Annual Meeting of the Halifax Chemists and Druggists' Association was held on Thursday, December 7, 1871; Mr. Stott, President, in the chair.

After the minutes of last meeting had been passed, the Secretary read the report of the Committee for the past year, of which the following are the principal topics. Like other local societies, the Halifax Association had to regret a falling off in the attendance at the Latin and chemistry classes, and a lukewarmness on the part of apprentices to avail themselves of the means placed at their disposal for adapting themselves to the altered circumstances of the times. It was pointed out that the time may come when, if they persist in neglecting the opportunity in their youth, they will be weighed in the balance and found wanting. This is plainly shown by the large number of youths plucked by the examiners every quarter. The report urged upon members to impress upon their apprentices that youth is the best time for study, and to deprecate the bad policy of trusting to something turning up, and, probably, at the last having to make up for lost time by cramming. The possibility of the Pharmaceutical Society soon ceasing to be an educating body was referred to, and an opinion expressed that such an act would place more responsibility on local associations and individual chemists, if not make a total change in the apprenticeship system altogether. The Association had offered active opposition to the proposed poison regulations. The Committee respectfully called attention to the value and importance of chemists and druggists' associations, banded together for their trade interests and mutual good. Had the trade been as formerly, without any cohesion in the body,—nothing more, in fact, than a rope of sand,—it is not assuming too much to believe that the Poison Bill, introduced by the Government, would have been passed. It was anything but a pleasant sight to witness the manner in which the Council dealt with the poison difficulty; pitted and divided against itself, it failed to exercise any amount of influence for good on the right side, and it behoves them to consider whether they could look to the Council as their guide in the future. In conclusion, an appeal was made for continued support to the Association. Though thinly attended, the meetings had not been held in vain. They had rounded off a few of the many sharp corners and angles that protruded a little too far, and the mingling together had been the means of dispersing not a few doubts and jealousies that had existed.

Mr. Farr, in moving the adoption of the report, congratulated the Society on having reached its fourth year of existence, which showed that it was built upon a firm basis. He was very much pleased at the success of the recent early closing movement, and thought the thanks of the trade were due to the Committee if they had done nothing more than give them one hour more for study, recreation and social intercourse.

This resolution was seconded by Mr. Jessop, and carried unanimously.

Mr. Stott (Sowerby Bridge) was re-elected President, Messrs. Dyer and Farr Vice-Presidents, and Mr. Robert Brook, jun., Honorary Secretary.

The President then thanked the Society for the honour again conferred upon him, remarking that he believed he was the oldest in the trade in that part, and that he was one of the original four hundred that formed the Pharmaceutical Society. He regretted that so many failures occurred in passing the Preliminary, and strongly urged upon members that no apprentice should be indentured until he had succeeded in the first examination. He rejoiced that Government had not succeeded in carrying the Poison Bill, but warned the Society to keep a sharp look-out next Session of Parliament. He strongly objected to the principle laid down by Mr. Wilkinson, that of deviating from prescriptions, as being perfectly unjustifiable. This is a point of great importance that should be attended to, or great mischief might result. On the other hand, it is the bounden duty of the prescriber, as stated by the *Lancet*, to see that the proper and necessary quantities of ingredients are ordered to secure the end aimed at, and not compel the dispenser to seek an interview with the physician.

BRISTOL PHARMACEUTICAL ASSOCIATION.

A General Meeting of the Association was held on Friday, December 8, 1871; Mr. Townsend, President, in the chair.

The President announced his intention of shortly making a specific appeal to his fellow-members for subscriptions towards a fund that was being raised for the purpose of sending some help to the pharmacists of Chicago who had suffered sadly by the late calamitous fire. He would call upon Mr. Stoddart for the lecture he had kindly promised them, upon "Potable Water: its Importance and its Impurities."

Mr. Stoddart then delivered his lecture, of which the following is an abstract, and, at its conclusion, received a cordial vote of thanks:—

After touching upon the importance of the water question, the office of water in the animal and vegetable economy, its physical properties, and the sources of supply, the lecturer drew attention to some celebrated Bristol wells, such as Jacob's well, All Saints' well, the Quay pipe, etc. Having shown how rain percolated through the earth to the wells, he remarked that so long as there were no houses on the top of Clifton Hill, no doubt Jacob's well contained very good water, but supposing the houses above it on the hill should throw out refuse, nothing could save the well from being contaminated. He had known a case in Unity Street, where it was ascertained that several children had typhoid fever on account of drinking the water from a well which was below the level of the Float, and into which injurious matter from the Float had made its way. There were wells in St. Paul's, in a bed of sand, which extended several square miles ten feet below the surface of the ground. This substance was so porous that any liquid matter percolated through it very rapidly; and as there were two churchyards in the district, he had no doubt that if all the wells were examined which were sunk in that bed of sand, they would find some of the water was nothing but animal solution. The well at the end of Terrell Street, when it was in the garden of the monks of the priory, which stood where St. James's Church now stands, undoubtedly gave very pure water, but since Kingsdown had been covered with houses, the whole drainage of Kingsdown went into that well, and the water was not fit to drink. It was almost impossible to have pure water in a city from a well, because impure matter would sink down into the source of supply. There was a danger arising from our sewers, which was often overlooked,—the noxious gases which arose to the top of the pipes, and which made their way very often under pressure of the tide into houses, and generated disease. As a matter of fact, the top of the hill was not so healthy as the bottom, although it was generally thought the reverse was the case. Three years ago zymotic fevers were more prevalent on the higher ground than they were on the lower. They had in Bristol a splendid fall for the sewage, but the houses were built so as to take the greatest care of these gases, and the wonder was the inhabitants were not all poisoned. One or two places in Bristol had actually been built with ventilating shafts, so that the gases could escape, and this should be the case in all houses to prevent the gases poisoning the air. That morning he had been astonished at reading that the Prince of Wales had been drinking Bristol water. He had seen in the *Times* a most exhaustive report upon the water of Scarborough and the neighbourhood. He found also that Lord Londesborough had been in the habit of using the Bristol water—the water from the Hotwells pump. More than that, an analytical chemist, having examined the Scarborough and other waters, found the Bristol water splendidly wholesome, the only water of the whole that was wholesome. That was admitted in the *Times* of that morning. Many persons might say that the illness of the Prince of Wales had been caused by the Bristol water; but if they read the report he had alluded to, they would find that the illness was undoubtedly caused by the gases which escaped from the sewers. The report was very plain and unmistakable on that point. Mr. Stoddart, referring to the water supplied by the Bristol Water Works Company, said they could not be too thankful for it. According to the report of the commission on the water of the United Kingdom, there was no better water, take it altogether, than that supplied by the Bristol Water Works. It came in hermetically-sealed pipes, into which no sewage could penetrate, from splendid reservoirs. The water was as pure as the water from the much-vaunted chalk wells of the East of England, and was as free from impurity as water could possibly be. The lecturer alluded also to the fallacy of popular tests, and showed that appearance and taste were not to be trusted; and concluded by drawing various sanitary deductions. The lecture was illustrated by specimens, photographs and diagrams, shown by the oxycalcium light.

Proceedings of Scientific Societies.

SOCIETY OF ARTS.

Dyes and Dye-Stuffs other than Aniline.*

BY DR. CRACE-CALVERT, F.R.S.

Lecture III.

Blue Colouring Substances.—Indigo, Orchil, Cudbear, Litmus, Prussian Blue and Ultramarine.

Indigo.—This most valuable dyeing substance was used as a dye-stuff in India and Egypt long before the Christian era, and the Romans were acquainted with it, although they only used it as a pigment, not knowing how to render it soluble, and so available for dyeing. It is only since the sixteenth century, or from the time of the discovery of the passage to India round the Cape of Good Hope, that it has become generally known in Europe; and its employment as a dye was greatly retarded by the opposition it met with from the large vested interests of the woad cultivators, who induced the English, French and German governments to pro-

* Cantor Lecture, delivered Tuesday, Feb. 21. Reprinted from the *Journal of the Society of Arts*.

mulgate several enactments against its use. So severe were some of them, that Henry IV. of France issued an edict condemning to death any one who used that pernicious drug called the "devil's food." It is only since the year 1737 that the French dyers have had the right of using indigo without restriction.

Indigo exists in several varieties of plants, among which may be mentioned the *Polygonum tinctorium* and the *Isatis tinctoria*, or woad; but, as in the case of nearly all the dye-stuffs already spoken of, it is found most abundantly in plants of the leguminous order. It is extracted commercially from the genus *Indigofera*, varieties of which grow abundantly in India, Java, China and in some of the South American States.

To extract the indigo which the plant contains, it is mowed when in full flower, made into bundles, and carried into large vats containing water. Fermentation ensues, which is allowed to proceed for eight or nine hours, when the liquor, which was yellow at the beginning of the operation, assumes a dark green colour, forming a blue scum on the surface. This liquor is then run off into shallow vats, where it is violently agitated with sticks, stirred by men or women, or with a dasher, which produces the same result, the conversion of the white soluble indigo into blue insoluble indigo. A little lime-water is now added, and the whole allowed to rest. The blue indigo thus deposited is boiled with water, when a scum, composed of vegetable and animal matters, comes to the surface and is removed. The blue paste is thrown on a filter, pressed and placed in wooden frames, which are divided into small squares, where the indigo is allowed to dry first in the sun and afterwards in the shade. The quality of the indigo produced depends mainly on the care bestowed on its manufacture.

Until 1855 we had no correct ideas as to the state in which the indigo existed in the *Indigofera* plants, nor of the changes which it underwent during the process of extraction. It had been stated by M. Chevreul, many years before, that white indigo was oxidized into blue. But in the above year, and subsequently, in 1857 and 1865, Dr. Schunck published a series of papers, in which he described the true nature of the chemical changes which take place in the manufacture of indigo. He operated on the *Isatis tinctoria*, or woad, which contains the same colour-giving principle as the *Indigofera*, and is the only plant yielding indigo that grows freely in this country.

By these researches he demonstrated that indigo existed in the plants, combined with a sugar, forming a glucoside, to which he gave the name *indican;* this compound, under the influence of fermentation in the manufacturing process, was unfolded into indigo and sugar. By treating the dried woad with ether or alcohol, Dr. Schunck obtained indican, and, among other processes for its extraction, gives the following simple one. He treats the pounded dried woad leaves with ether in a displacement apparatus, and distils off the greater part of the ether. The remaining green liquor is then evaporated at a moderate temperature, a little cold water added to the syrupy residue, and the insoluble chlorophyl and other matters separated by filtration. The yellow liquid thus obtained is evaporated, either spontaneously or in vacuo.

Indican is a yellow, transparent, glutinous solid. As may be seen from the above, it is soluble in alcohol, ether and water. When boiled with caustic alkalies it evolves ammonia, but its most remarkable and interesting property is that of yielding indigo blue when treated with strong acids. If sulphuric or muriatic acid be added to its water solution, no change whatever is perceptible for some time; but on heating to near the boiling-point, the solution immediately becomes sky-blue. On boiling for a short time, the solution becomes opalescent. On continuing to boil it acquires a purple colour, and then, provided the solution is tolerably concentrated, a copious deposit of dark purple flocks is formed. These are collected on a filter and washed with water. By treating the washed flocks with alcohol, Dr. Schunck obtained pure indigotine, and a reddish-blue substance was dissolved, called by Berzelius indigo-red, and by Schunck indirubine, which may be considered as a product of the decomposition of indican.

The colour-giving principle of the plant may be considered, like those of the dye-woods, as a glucoside, yielding by its decomposition a colourless principle, which is afterwards converted into a colour. Dr. Schunck explains by the following formula the decomposition of indican into indigo:—

$$\underset{\text{Indican.}}{C_{26}H_{33}NO_{18}} + \underset{\text{Water.}}{H_2O} = \underset{\text{Indigo.}}{C_8H_5NO} + \underset{\text{Indiglucine.}}{3(C_6H_{10}O_6)}.$$

In 1864 he published a most valuable paper, throwing much light on the manufacture of indigo, and the management of what is called a woad vat. In it he gives the chemical actions which take place, and explains why, if the indigo manufacturer does not take the greatest care in conducting the process of fermentation, to extract the indigo from the plant, he will either get an inferior quality of indigo, or a great decrease in the yield of the product, or even in some cases entirely lose the colouring matter. He shows that these results take place when the fermentation in the vats is allowed to be either too rapid or too prolonged, in which cases not only is indican decomposed, but the *indiglucine*, or sugar, is converted into alcohol and acetic acid; and he shows that the indigo combines with this alcohol and acetic acid, yielding a compound which does not permit the indigo it contains to be oxidized on exposure to the air. This explains the loss of indigo in its manufacture. Dr. Schunck represents the change by the following formulæ:—

$$\underset{\text{Indigo.}}{C_8H_5NO} + \underset{\text{Alcohol.}}{8(C_2H_6O)} + \underset{\text{Acetic Acid.}}{3(C_2H_4O_2)} + CO_2$$
$$= C_{31}H_{39}NO_4 + 13H_2O.$$

He produced this compound more easily by treating pure indigo blue with alcohol, to which was added an alkaline solution of protoxide of tin, until the indigo was dissolved, acetate of soda was then added, and the whole digested at a moderate temperature. The indigo blue after some time ceased to be deposited on exposure to air, having entirely disappeared, and been converted into the new compound.

Pure indigo, or indigotine, can be prepared from indican, by the process already described, or by reducing indigo to powder, placing it in a small dish on which is a cover, and applying a heat of about 300° or 400° F., when beautiful prismatic needles of indigotine are sublimed, which are removed mechanically. It is insoluble in water, alcohol or ether, or in weak acids or alkalis, but is slightly soluble in creasote, carbolic acid, and anhydrous acetic acid, to which a very small quantity of sulphuric acid has been added. From this latter solution, the indigotine may be precipitated by the addition of water. It is the only solution of blue indigo that can be applied directly on a fabric.

Indigotine, when heated, gives off beautiful violet vapours, having a characteristic odour. Under the action of oxidizing agents, such as nitric acid, it yields three distinct products, *isatin*, $C_8H_5NO_2$; *indigotic* or *nitrosalycilic* acid, $C_7H_3(NO_2)O_3$; and picric acid, $C_6H_33(NO_2)O$. The first is formed by simple oxidation, whilst in the second and third, part of the carbon is oxidized, and hyponitric acid is substituted for part of the hydrogen. These chemical reactions lead me to call your attention to some very interesting scientific deductions, showing indigo to bear a very close relation to aniline and carbolic acid, both products derived from coal-tar. If indigotine is heated with potash in a small retort, aniline is produced, and distils over. When indigo is heated for some time with caustic potash solution of sp. gr. 1·35, it yields anthranilic acid, which may be considered as a phenyle-carbamic acid. Anthranilic acid again, being heated to 570° F., gives salycilic acid, which may be considered as a compound of carbonic with carbolic acid. Lastly, indigotine, like carbolic acid, yields on treatment with excess of nitric acid, picric or trinitrophenic acid.

These facts have produced on the minds of chemists a conviction that indigotine will one day be artificially prepared from carbolic acid, and recently MM. Emmerling and Engler have accomplished the scientific artificial production of indigotine from a compound acetone, discovered in 1857 by M. Friedel, to which these gentlemen have given the name of acetophenone. Their process consists in acting on this compound with fuming nitric acid, when two nitro-compounds are produced, one crystalline, the other syrupy. To the latter, after its evaporation to the state of a resinous mass, they add ten parts of reduced zinc and one part of soda-lime. The mixture is heated in small tubes, when a little water evaporates, and a dark-coloured substance sublimes, which contains indigotine in small quantities. This result is certainly a triumph of scientific chemistry, and brings us another stage nearer the commercial artificial production of a most valuable dye.

A great variety of substances, by adding one equivalent of hydrogen, convert blue indigo into white indigo, which is a colourless substance, without taste or odour, insoluble in water, but soluble in alcohol and ether, and in solutions of the alkalis and alkaline earths. On this point I may observe that, many years ago, I devised a process by which many pounds' worth of indigo were recovered from the refuse bottoms of the blue dip vats, the preparation of which I shall explain further on. I found that indigo was susceptible of forming insoluble compounds with the lime and protoxide of iron. White indigo dissolves freely in strong sulphuric acid, giving a dark purple-blue liquor.

Many substances are employed commercially to convert blue indigo into the white indigo soluble in alkalies. Thus, I may mention lime and protoxide of iron, caustic alkali and protoxide of tin, or sulphuret of tin or arsenic, and zinc and caustic alkali; also organic substances, such as grape sugar and bran, which enter easily into fermentation. The following formulæ show the difference of composition of the two indigos:—

$$\underset{\text{Indigotine.}}{2(C_8H_5NO)} + \underset{\text{Hydrogen.}}{2H} = \underset{\text{White Indigo.}}{C_{16}H_{12}NO_2}.$$

I shall now have the pleasure of proceeding to describe some of the methods employed by chemists to determine the relative commercial value of samples of this expensive dye. The best qualities of indigo from Bengal, Java and Guatemala are light, have a uniform texture, and a fine coppery hue, which is increased by friction. The following analysis, made by M. Chevreul, shows the composition of a fair sample of commercial indigo:—

Indigotine	45
Matters soluble in alcohol	30
Matters soluble in ether	12
Resin soluble in hydrochloric acid	6
Mineral matters	7
	100

Commercial indigos are often adulterated with mineral matters of various kinds. This fraud is easily detected by calcining a known weight of the sample, which ought not to leave a residue of more than 10 per cent. The most common adulteration, however, is the addition of starch. This can be detected by boiling some of the pulverized indigo with a weak solution of hydrochloric acid. The insoluble starch is thus converted into soluble dextrine, which yields a beautiful purple colour with iodine.

There are several processes employed to determine the amount of indigotine in commercial indigos. I shall here only give the outline of three. The first consists in dissolving one gramme of the dry pulverized indigo in twelve grammes of concentrated sulphuric acid, and heating the whole at a temperature not exceeding 120° F., when the indigo combines with the sulphuric acid, and becomes perfectly soluble in water. It is then diluted with water, so that the whole occupies one litre. The operation is repeated with one gramme of pure indigotine, which serves as a standard of comparison. A solution of bleaching powder, or bichromate of potash—the first proposed by M. Chevreul, the latter by Dr. Penny—is prepared of such a strength that one hundred volumes of the solution will completely destroy the whole of the colour produced by the gramme of indigotine. Part of the same liquor is then applied to the solution of the commercial indigo, and the number of volumes required to destroy the colour represents the percentage of indigo. Thus, if 60 divisions are required, it is assumed that there is 60 per cent., if 70 divisions, 70 per cent. This method of estimating the indigotine is not to be relied on, as it always gives a much higher percentage of colour-giving principle than exists in the indigo, owing to the hypochlorous acid of the bleaching-powder, and the chromic acid of the bichromate not only decomposing the indigotine, but acting on several colouring matters which are included in the portion soluble in alcohol in M. Chevreul's analysis.

The second process gives better results; it is due to Professor Fritzsche, and consists in introducing one part of indigo, finely pulverized, and one part of grape sugar, into forty-eight or fifty parts of boiling alcohol, to which are added two parts of a concentrated solution of caustic soda. The whole is put into a bottle exactly large enough to hold it, and left to cool. By exposing the colourless liquid to the atmosphere, the reduced indigo which is in solution absorbs oxygen, and the indigotine is precipitated under the form of beautiful prismatic crystals.

The third process, devised by myself, I have found to give satisfactory results. It consists in introducing into a flask one part of finely pulverized indigo, two parts of green copperas, and two hundred parts of water containing 10 per cent. of caustic soda. The whole is kept at the boil for a short time, and allowed to cool. The clear liquor is exposed in shallow vessels to the atmosphere, when the soluble indigo is oxidized, and precipitates as pure indigotine. The residue in the flask is submitted to the treatment three times. The whole of the indigotine thus obtained is collected on a filter, dried, and weighed.

A commercial process, founded on the above method, is carried on by Messrs. Haas and Co., who sell indigo so purified under the name of refined indigo. An inferior quality is also prepared by heating indigo, at a moderate temperature, with weak muriatic acid, which dissolves lime and other mineral matters, as well as any starch it may contain; it is slightly washed and boiled with weak caustic soda, to dissolve the chlorophyl and other resinous impurities.

I shall now call your attention to three commercial preparations of indigo, obtained by the action of sulphuric acid on it. The first is called *sulpho-purpuric acid* or *phenicine*, which is made by adding one part of indigo to four parts of highly concentrated sulphuric acid, heating for a short time, varying from half an hour to an hour, or until a small quantity of it mixed with a large quantity of water gives a deep purple colour. Great care must be bestowed on this part of the operation, so as to avoid the formation of a compound, to which I shall have again to call your attention, *sulpho-indigotic acid.* The acid mass produced is thrown into about 40 or 50 parts of water, when a beautiful purple precipitate is produced, which is collected on a filter, and slightly washed with weak muriatic acid. To dye wool with this sulpho-purpuric acid it is necessary to add to the bath a little muriatic acid, when it yields to the wool a fine dark purple-blue, that can be converted into various shades of purple by passing the wool so dyed in a bath containing a small quantity of carbonate or acetate of soda, which removes a small quantity of sulpho-indigotic acid that may be present, and gives rise to *sulpho-purpurate of soda*, which is a faster dye than the acid.

Sulpho-indigotic Acid is manufactured by dissolving one part of indigo in ten or twelve parts of concentrated sulphuric acid, and heating the whole at a temperature of 120° F. very carefully for some hours. The operation is completed when a small quantity dissolves entirely in cold water.

The acids above described, when obtained perfectly pure, have the following formulæ:—Sulpho-purpuric acid, $C_{16}H_{10}N_2O_2, SO_3$; sulpho-indigotic acid, C_8H_5NO, SO_3.

Berzelius admits a third compound, called *hypo-sulpho-indigotic acid*. These acids are transformed into neutral salts of soda, and sold under the names of neutral paste and carmine of indigo. They are prepared by neutralizing the sulpho-acids with carbonate of soda, and the paste so formed is thrown on a woollen filter to remove the sulphate of soda which it contains, as well as a green colouring matter, which is doubtless modified chlorophyl. The paste is then washed with a solution of chloride of sodium. It is a curious fact that carmines of indigo, which are perfectly soluble in pure water, are altogether insoluble in water containing either sulphate of soda or chloride of sodium.

Whilst speaking of the sulpho-indigotates, it may be useful to notice that the sulpho-indigotates of potash and soda are soluble in 100 to 150 parts of water, the sulpho-indigotates of lime, magnesia, and alumina are freely soluble, whilst those of baryta and lead are insoluble.

(*To be continued.*)

Parliamentary and Law Proceedings.

Prosecution of a Chemist for Misrepresentation.

Dalrymple *v.* Lakin.

In this case the defendant had been summoned before the Leicester magistrates, under the Medical Act, for having illegally practised as a doctor of medicine.*

On Friday, December 1, at the request of the Mayor, the judgment of the Bench (which went fully into all the facts of the case) was read, the substance of which was as follows:—"In the case now before us, it appears that the words 'Dr. Lakin' are on a plate at the side of the door; that the words 'Dr. Lakin, botanic practitioner,' are over the window in large letters, extending the whole length of the front of the house; that the defendant is in possession of an American diploma; and that in a certificate of death he describes himself as 'M.D. (U.S.).' With respect to this certificate, we think no one can successfully contend that a person who actually describes himself as M.D. (U.S.)—evidently meaning a doctor of medicine of the United States—is guilty of the offence of wilfully and falsely assuming the title of doctor, so as to imply that he is a recognized physician in England; and the words 'botanical practitioner' would probably be viewed in the same light as 'mechanical dentist' were in *Ladd* v. *Gould*, as they do not appear to be such words as would be used by any medical man who wished it to be known that he was a legally-qualified practitioner, and registered under the Act. Although we could have wished that the facility with which foreign diplomas are obtained, and their utter worthlessness in many cases as tests of medical proficiency, had been more fully brought under the notice of the Court of Exchequer, yet, after the decision in *Ellis* v. *Kelly*, which opened the door for the admission of foreign diplomas for the purpose of negativing the charge of a false pretence, and the view of the right to use the word 'doctor,' taken even in a work regarded as one of the organs of the medical profession, in which it is broadly stated that a person in the possession of the degree of M.D. under a diploma from the College of Pennsylvania, however obtained, has the right to call himself a 'Doctor of Medicine' if he pleases (see *Lancet*, September 23, 1871, p. 457),—we do not feel justified in convicting the defendant of the serious offence of having by 'wilful falsity' used the title of doctor, he being in possession of a diploma from an incorporated college in the United States, which has the appearance of being, although not legally proved to be genuine; as the possession of such a document may have led the defendant to believe, in common with some members of the medical profession in England, as shown by the publication to which we have referred, that he was entitled to use the prefix of 'Dr.' to his name, and this may under a penal statute be an answer to the charge of having 'wilfully and falsely' assumed such title. We think it will not be out of our province to add that if the Medical Act were intended to give any security to the public that medical practitioners should be persons of education and science, it has to a great extent failed in its object; and that to be effectual it requires material amendment, as the offence created by the Act is not that of practising without being registered,—for which there is no penalty,—but of wilfully and falsely using a name or title implying that the party has been registered, an offence which, considering the interpretation put on the words 'wilfully and falsely' in the cases referred to, it is exceedingly difficult to prove in a court of law."

* See *ante*, p. 457.

Action for Recovery of Apprenticeship Premium.

Court of Common Pleas, Westminster, Dec. 4.

Before Mr. Justice Byles and a Common Jury.

Fowler *v.* Curtis.

Mr. D. Seymour, Q.C., and Mr. Collins were counsel for the plaintiff; Mr. Serjeant Parry and Mr. J. O. Griffiths for the defendant.

This was an action to recover damages for a breach of covenant in an apprenticeship deed. The plaintiff was apprenticed to the defendant, a chemist, druggist and dentist in the Haymarket, for the term of three years and a half. Towards the close of the first year the defendant became unwell, and was advised to dispose of his business, which he did, and was consequently unable to continue to instruct the plaintiff in the art and mystery of the profession. The defendant paid into Court the sum of £130, part of the premium of £170 received from the plaintiff, retaining £40 for the instruction and other benefits received during the first year of the term. The plaintiff was dissatisfied with this, representing to the jury that the first year's instruction was little more than the drudgery of minding the defendant's shop from early morn to late at night.

The jury found that £130 was insufficient, and gave to the plaintiff £40 more,—in effect, finding that the plaintiff was entitled to the return of the entire premium.

Suspected Poisoning.

On Tuesday, Dec. 4th, an inquest was held at Hoxton, to inquire into the circumstances attending the death of William Dent Russell, aged seven months.

Amelia Russell, wife of William Russell, a cabinet-maker, said that deceased was her son. He had a cough for some time past, and she often gave him some mixture which she had obtained from a chemist. After administering some of it to the child on Thursday, he became suddenly ill, and died at four o'clock on Friday morning in great agony. Her husband was very unkind to the deceased, and often said he wished it was dead. Her husband used oil of vitriol in his business.

Mr. Walter Rumbold, M.R.C.S., said he had made a post-mortem examination of the body, and found that the lips, mouth, throat and stomach were shockingly burned by sulphuric acid (oil of vitriol), and death was the result of poisoning from such acid.

William Dent Russell, the father, made the following statement:—I use oil of vitriol for lime-light. I last used it six weeks ago. I kept it in the coal-cellar. I was tipsy on Monday, but on Tuesday, Wednesday and Thursday was sober. I work for Sanders and Co., of Oxford Street. I cannot account for the death of the deceased.

The Coroner, addressing the jury, said that it would be better to adjourn for further inquiries to be made. It certainly appeared as if the acid had been put in the bottle by design, and the evidence given tended to show that the father wished to get rid of the poor infant. The case accordingly stands adjourned for further evidence. —*Daily Telegraph.*

Reviews.

RESOURCES OF THE SOUTHERN FIELDS AND FORESTS, MEDICAL, ECONOMICAL AND AGRICULTURAL; being also a Medical Botany of the Southern States; with Practical Information on the Useful Properties of the Trees, Plants and Shrubs. By FRANCIS PEYRE PORCHER, M.D., formerly Surgeon in charge of City Hospitals, Charleston, Lecturer on Materia Medica and Therapeutics, etc. New edition. Revised and largely augmented. Charleston: 1869. Trübner and Co., London. Post 8vo, pp. xv. 733.

It is an old saying and a very true one, that "necessity is the mother of invention." It often occurs that when a source of supply fails, we turn our eyes nearer home, and find almost at our feet that which, but for the foreign supply failing, we should have overlooked. But let us explain what this has to do with the book before us. When the Southern States of America declared a war of independence, as a necessary result all their ports were blockaded and their foreign supplies cut off. The Southern authorities, fully appreciating the varied and rich flora by which they were surrounded, instructed Dr. Porcher to use his best efforts to find substitutes for the foreign vegetable products, applicable to the wants of the surgeon as well as to the planter and farmer. For this duty our author was the better qualified, inasmuch as, for a period of twelve years previously, he had paid great attention to the subject, and had practically tested many of the substances he enumerates. The results of his labours are here given, and the book is intended as a handbook of scientific and practical knowledge as regards the medical and economical products of the plants of the Southern States, and capable, if need be, to serve present or future wants, thus rendering them, in a great measure at least, independent of foreign supplies.

The author only claims for his book the title of a compilation; but though this is the case to a great extent, yet he has spared no pains to render it as complete as possible, extending his note taking from the pages of Ray, Culpepper, Thornton, Woodville, Lindley, Royle, Pereira, and Merat and De Lens, to the latest floras and local plant catalogues. Under each plant he gives a copious list of authors, to whom reference can be made for fuller information. The articles which meet with the fullest notice are the seven staple articles, viz. cotton, rice, sugar, tobacco, wheat, corn and turpentine, as also those more or less likely to figure largely, as grapes, wine, sorghum sugar, tea, esparto, flax, mustard, castor and other oils, starch-yielding plants and timber and furniture woods. Cryptogamous plants are dealt with somewhat curtly, the author giving, as his reason for so doing, a previous publication of his, which appeared in the seventh volume of the 'Transactions of the American Medical Association.'

The information is arranged in Natural Orders. This naturally leads to many cross-references; and though, perhaps, on the whole, as good an arrangement as any, yet we should not have been sorry to have seen an attempt at grouping, under good headings, the various substances according to their properties; as in a book such as this, destined for general use, the latter arrangement would have appealed more to the sympathies of unscientific readers. The author gets over the difficulty by treating certain substances at length under the plant characteristically rich in such products. Thus under the oak and hickory we have an account of potash and potash soap and their manufacture; under salsola and fucus, soda and soda soap; under pine and willow, an account of charcoal; and oils in general, under *Sesame.* This is the name given to the seeds of *Sesamum indicum.* The author gives an account of this plant under the trivial name *Bene.* This is to be regretted, as it more properly belongs to *Moringa pterygosperma*, and in Europe is so understood. In justice, however, we may state, that so far as we have examined it, the index is a very trustworthy and ample one. Under *Papaver*, we have a long account of the manufacture of opium. *Argemone mexicana*, an almost cosmopolitan plant, the oil of whose seeds has been highly recommended by some as a specific in cholera, is not highly spoken of. The root of *Panax quinquefolium* is valued for its stimulant, stomachic and tonic properties. It meets with a ready sale in China, being much cheaper than that of *P. ginseng*, a Chinese imperial monopoly.

Thea viridis, grown in South Carolina, is well spoken of. Oranges, limes and citrons are cultivated in the warmer regions.

The fruits of *Stillingia sebifera* are largely used in candle making. In the account of the American indigo plant (*Baptisia tinctoria*), tinctorial plants and dyeing are treated generally. The bark of the root of *Robinia pseudo-acacia* is recommended as a tonic in large doses; it is emetic and purgative, and the inner bark is recommended as a source of fibre, the seeds as oil, the flowers as a yellow dye, and the wood for shipbuilding. Under *Anacardiaceæ*, the account of the poison oak (*Rhus toxicodendron*) and shumac (*R. glabra*) are very interesting. The leaves of *R. copallina* were used by the soldiers in camp to increase the bulk, and render milder, ordinary tobacco. Sassafras tea, as a substitute for green tea, was a great favourite with the Southern States' officer during the war. In *Sarracenia* the author has no confidence as a specific in smallpox. Under another well-known plant, *Sanguinaria canadensis*, references are given to no less than twenty-five writers on the subject. The leaves of *Opuntia vulgaris* are used for hardening candles instead of wax. There is also a good account of *Acer saccharinum*, and the manufacture of the sugar from it. The seeds of *Æsculus pavia*, L., contain much starch, and the washings of it are very narcotic; ten grains of the powdered rind being considered equal to three of opium, and the roots are preferred to soap for washing and whitening woollens, blankets and dyed cottons. Under the head of *Linum usitatissimum*, oils are treated of generally. *Hibiscus esculentus* is spoken of as being twice as mucilaginous as *Althæa*, and of great uses in culinary and medical preparations; the seeds roasted are used as a substitute for coffee, and are also used on account of their albumen in clarification in St. Domingo.

Rice, formerly at least largely grown in Carolina, meets with a very full account. Since the war little or no Carolina rice has been exported to this country. That which commonly passes under that name now is produced in Berbice. We may mention, though the fact is not noticed by our author, that Carolina is believed by some to have owed the introduction of her rice to Madagascar; certain it is that the varieties are remarkably alike.

The trivial or vernacular names are appended to the plants, in many cases identical with those given in other countries to widely different plants, thus showing the necessity in quoting a native name, to append the name of the locality or country in which it is used. Nothing is more natural than for a person leaving one country, with its scenes and associations vividly impressed on his mind, on arriving in a new one to endeavour to perpetuate these associations by naming the surrounding objects in accordance therewith. By reference to the index we find from thirty to fifty plants are mentioned as alteratives, antiperiodics, aromatics, astringents, cathartics, diuretics and narcotics.

But here we must draw our lengthy notice to a close. Though events happily have not driven the Southern States to the dire necessity of finding in their own area all the supplies for the real and artificial wants of their inhabitants, yet the information cannot but prove of value. Though the book is not original, yet the author has brought together, in an available form, the scattered literature of the subject, and has not failed to indicate his authorities,—a virtue, sad to say, regarded as somewhat antiquated, the work of the clever paraphrast passing often as original.

The Chemists and Druggists' Diary and Pharmaceutical Text-book, 1872. London: 'Chemist and Druggist' Office.

A "sign of the times" has reached us in the shape of the annual issue of this useful book. As this is the fourth occasion upon which the publishers have provided a diary specially prepared to meet the convenience of chemists and druggists, it is only fair to infer that the speculation in past years has been a successful one. We venture to predict that the present will be no less so, and that many more times the 'Chemists and Druggists' Diary' will appear with the fogs, frosts and snows of the closing year to help to supply our wants in the new one.

In one respect, at least, the Diary just published is an improvement upon its predecessors: the size of the page is doubled. This alteration, although not going quite as far as our suggestion last year, allows a much larger space for each day's entries. In the pages set apart for literary matter the principal feature this year is a collection of pharmaceutical formulæ of compounds, Continental in their origin, but frequently demanded from the pharmacist in this country. They are arranged under the respective headings of "France," "Prussia," "Austria," "Saxony," "Russia," and "Denmark, Norway and Sweden." These formulæ have been compiled by Messrs. Joseph Ince and S. W. Rich, of London; F. Froedman, of St. Petersburg, and H. Fölker, of Dresden. As we have a guarantee that no formula is given that has not been frequently used by the writer himself, there is here, doubtless, a great quantity of valuable information brought within a small compass, though we are inclined to doubt the propriety of classing some of it under the respective countries. For instance, there does not appear to be anything peculiar to the formula for "foie de soufre," or "liver of sulphur," that may not be found in the potassa sulphurata, B.P. The ingredients are the same in the same proportions, and the manipulation does not appear materially to differ. Under the heading "United States," are given a list of all the preparations of the U. S. Pharmacopœia, which have no direct representatives in the B. P., and a list of differences in the preparations which are common to both Pharmacopœias.

Among the other matter specially interesting to pharmacists, we may mention abstracts of Acts of Parliament likely to affect them;—a "Table of Maximum Doses," and an "Approximate Table of Solubilities." Solubilities have frequently given rise to difference of opinion, and the word "approximate" gives a certain amount of latitude: but we think this is overstepped in some cases in this table, *e. g.* when the solubility of acetate of potash in cold water is given as one part of the acetate in two of water.

The Diary is published in two forms, one being interleaved with blotting paper and in superior binding. Besides the subjects mentioned above, it contains a fair quantity of the information usually accompanying almanacks.

Obituary.

PROFESSOR SPOONER.

It is with regret that we have to announce the death of Professor Spooner, who for many years occupied the most prominent position in the veterinary profession. Professor Spooner entered the Royal Veterinary College as a student in the year 1828, and after attending the then limited course of study in that institution, obtained the diploma entitling him to practise as a veterinary surgeon. He afterwards established classes for private instruction outside the College walls, and conducted them with great success for about nine years. During a part of this period he held the post of veterinary surgeon to the Zoological Society. The first collegiate appointment he received was that of Demonstrator of Anatomy to the Royal Veterinary College, and after passing through the grades of Deputy-Professor and Professor, he ultimately rose to the position of Principal. This last office he held for eighteen years, and until he died of disease of the heart on the 24th ult., Professor Spooner was a most eloquent lecturer as well as a clear expositor of veterinary science, and to him a large proportion of the present generation of veterinary surgeons are indebted for much of their professional education. As a witness in cases of veterinary jurisprudence few, if any, could equal him; and from his great and varied experience, his testimony and opinion were highly valued by judge, jury and client. Professor Spooner became President of the Royal College of Veterinary Surgeons in 1858; he was also a member of council, and an *ex officio* member of the board of examiners. By many his loss will be keenly felt, for they will be deprived of a sound professional adviser and a staunch friend.

MEETINGS FOR THE ENSUING WEEK.

Monday, Dec. 18. ......*Medical Society*, at 9 P.M.
London Institution, at 4 P.M.—"Locomotion, Voice and Speech." By Professor Huxley. (Educational Course.)

Thursday, Dec. 21. ......*Chemical Society*, at 8 P.M. "On Eulyte and Dyslyte." By H. Bassett.
Linnean Society, at 8 P.M.
London Institution, at 4 P.M.—"The Philosophy of Magic." By J. C. Brough. (Holiday Course.)

VACANCIES AND APPOINTMENTS IN CONNECTION WITH PHARMACY.

The Editor will be glad to receive early notice of any vacancies of pharmaceutical offices connected with public institutions, and likewise of appointments that are made,—in order that they may be published regularly in the Journal.

APPOINTMENT.

Mr. F. J. Barrett, Pharmaceutist to the South Staffordshire General Hospital, has received the additional appointment of Chemist and Analyst to the same Institution.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Shall the Pharmaceutical Society cease to be an Educating Body?

Sir,—In response to the editorial invitation that those who hold decided views on this question would communicate them, I make bold to offer a few remarks, though fully sensible of their imperfections. Before so doing, however, I would observe that an important subject as this is deserves the fullest consideration, and it is very desirable that it be freely discussed in all its bearings and positions.

When authorities such as Mr. Mackay and Mr. Schacht speak so plainly and with such confidence, it is time we looked the contingency fairly in the face, and henceforth determine to set our house in order, so that when the time comes we may be prepared to acquiesce in whatever change is deemed most desirable. Thoughtful practical men, men who have the interest of the Society at heart,—and I rejoice to say such are by means few,—must, I think, sooner or later adopt the view expressed by Mr. Schacht, that the duties of teacher and examiner ought not to coexist in the same body. It is a recognized fact that an examination by a Board entirely separate from the teaching faculty is productive of results more valuable and reliable as a test of merit than where the two offices are combined. This principle is accepted by different educational bodies, national and private. In these days the schoolmaster who is wishful to have a thoroughly practical and unbiassed examination for his pupils arranges with such a body as the College of Preceptors, or examiners appointed by one of the universities, to undertake that duty. Governmental, diocesan and some denominational schools—in fact, the majority of educational bodies—are periodically examined by their different inspectors. The Pharmaceutical Society is an exception to this rule. With the one hand it educates, with the other examines those it has educated. However, since 1868, its position and duties are clearly defined. Before that date it was a voluntary body, doing a voluntary work; now it has compulsory powers, and is bound to execute certain duties in return for its privileges, the head and front of these duties being examination, but by no means education. Personally, as an old student of the Society, I shall be sorry to see it deprived of those educational powers it has used through good and evil report for so many years with such undeniable success; but if the majority decide that the separation of functions is beneficial, individual feeling will give way.

Supposing it to be generally admitted that the severance is needed, where are we to look to for the educational part to be carried out? I answer, turn over the pages of the Pharmaceutical Journal,—say during the latter part of the decade of 1850,—and note the scanty number of provincial chemists' associations, whose titles and doings there appear. Afterwards turn to the Journal of the present time, and contrast the large number of associations that are now in healthy, vigorous existence, and already providing a useful technical education. In my opinion, it is to these associations that we must ultimately look for the supply of trained pharmacists; and it seems to me that they will eventually occupy the same position in regard to pharmacy that the different medical schools do to that profession. Suppose we take it for granted that the local schools fulfil the duty of preparing students for examination, it should then be arranged that these schools be the only recognized source of pharmaceutical education after a regular apprenticeship, and that without certificates of attendance on a certain number of classes and lectures at one of them, no student should be eligible for examination,—a similar proceeding to that adopted by most of the medical examining bodies of the present day. The fees received would, I have little doubt, in a short time be sufficient to defray all expenses, and until then the parent Society might reasonably be asked to assist by grants of money and material; or it might adopt the capitation system, and pay over to the school whence the successful candidate proceeded a certain sum of money, according to the excellence of the examination passed.

Already in some of our larger towns do these associations exist, only wanting time and circumstances to develope them into centres of high-class pharmaceutical education.

The examinations then would take place at Bloomsbury Square as usual; in fact, the present arrangements for the conduct of that duty would amply suffice. I think that by a plan something after this fashion we should not find the transition either violent or objectionable, especially as many students are examined at present who have not prepared themselves at head-quarters. Then we should have the local associations doing their own work of educating, and the Pharmaceutical Society its own work of examining and rewarding.

With regard to the plan advocated by Mr. Schacht, I think the great objection to its adoption would be the single yearly examination. Considerably more than the one opportunity is required. It might frequently happen that a young man would lose a favourable opening for commencing business simply because he had not got his diploma, and might have to wait the greater part of a year before he could obtain it; whereas under the present system he need not wait for more than a few weeks, presuming him to be ready in every other respect. Again, I can imagine that an examination by written papers alone is not so satisfactory to the examiners as that in which the *vivâ voce* takes the leading part. Papers are very well as far as they go, but they cannot convey to the mind of the examiner the same impressions as to the capabilities of the pupil that personal intercourse does. These reasons incline me to think that a yearly examination would not meet the necessities of the situation.

The plan thus imperfectly sketched out I am sanguine enough to think will bring about the same results, but in a rather different way, as that suggested by Mr. Schacht. I now leave the matter to the consideration of the readers of this Journal, and hope it may meet with that attention so vital a question demands.

Liverpool, Dec. 6th, 1871. T. H. Hustwick.

Dispensing Difficulties.

Sir,—When my unfortunate paper was written I had not the least expectation of seeing it in print, and quite as little that it would have called forth such a display of virtuous indignation, or I should perhaps not have expressed my ideas in quite such plain terms. I do not, however, yet see that the part so much objected to deserves all the hard words that have been said about it, or that its "whole tendency" is to "lead apprentices or assistants to think they are doing but right if they go a little further, and omit or substitute by others the ingredients of any prescription entrusted to them."

I cannot accept T. B.'s dictum "that if the extracts are evaporated until of suitable consistence for forming pills," there would be no difficulty; for we could scarcely name a single extract which if made the proper consistence for pills would keep in that condition for any length of time; most of them either speedily dry up and become too hard, or attract moisture and become too soft; and in this fact lies the whole difficulty. I dare almost go so far as to ask T. B. if he ever saw any (workable) extract he could form into pills that would *keep their shape*, or that would not go soft without the addition of something to prevent it? and really, the difference in strength between pulv. hyos. and ext. hyos. is so slight as to be hardly worth naming, and I suggested its use in order that as little alteration as possible might be made in the strength of the medicine; moreover, it is a question whether more injury may not be done to the extract in drying it on a slab over the gas as F. W. S. suggests, than would compensate for the difference.

With regard to essential oils, everybody knows that if we put more than a certain proportion into a pill-mass it works out in the manipulation unless some "*dodge*" is practised, and I cannot perceive that it makes very much difference (except as a salve for the conscience) whether the excess is worked out on the fingers and pill-machine, or left out in the first instance, whilst the latter method certainly makes the most satisfactory pill; and with respect to the iron and gentian pills, I would say that I have tried p. ferri sulph., and do not like it, whilst by using a little p. gentian instead of extract, I am able to get in a larger quantity of the oil of cinnamon than I otherwise could do.

I do not know what my critics may think allowable in *their own practice*, but it does seem to me that the addition of 24 gr. magn. calc. to 2 oz. pills, though they be "of convenient size, well made and of good consistence," is hardly consistent with the use of the ugly words to which I have been so freely treated; it appears rather to show that the gentlemen who have been so ready to condemn me are quite ready to adopt any pet schemes of their own, whether in accordance with the intentions of the prescriber or not. I would suggest that in future, when disposed to accuse other people of improper practices, they should be quite sure their own practice is pure; whilst to Mr. Clark I would say that his "presumption that the Manchester chemists have but lax notions of the duties of their calling" strongly suggests one of Æsop's fables which tells how a sick and aged lion was treated by certain other quadrupeds,—only that the Manchester chemists are not yet quite in the condition of the poor old lion.

F. W. S. has mistaken my question in reference to the second prescription named in my letter of the 20th ult. I did not refer to the manipulation at all, but to the directions of the prescriber; the weight of the ingredients was 9 grs., and the directions were "FINGE IN PILULAM. Sumat duas h. s.," and I wished to know what T. B. would have done in that case, the physician not being accessible.

Referring to your article of the 25th ult., where you lay it down as being "clearly and positively the duty of the dispenser to communicate with the prescriber in all cases of doubt or difficulty," no doubt it is so in theory, but hardly possible in practice. There are cases where it is easy enough to do so, as for instance where the prescriber lives near the dispenser, or the hours are known when he may be seen; but suppose the case of a physician residing in another town, or whose name I do not know or for any other reason cannot get access to, and I receive a prescription which contains a palpable error, but I can plainly see what is intended,—am I to decline to dispense it until the prescriber can be communicated with? Should I not rather use my own common sense, dispense the medicine as it was meant to be, and let the patient have it at once, which might be of consequence, and so save all parties from the annoyance a contrary course would have produced?

I do not by any means suppose it the "whole duty" of the dispenser to guess at what he cannot read, to remedy real or imaginary errors, or to reduce a dangerous dose; on the contrary, I believe it to be our duty in all such cases to consult the prescriber where it is possible to do so, but at the same time I do not quite see why the study of chemistry, materia medica, botany, pharmacy, etc. should be so much insisted on if we are not to use the knowledge we possess when occasion requires it.

Cheetham Hill, Dec. 5th, 1871. W. WILKINSON.

THE BRITISH PHARMACOPŒIA.

Sir,—The members of the Pharmaceutical Society, and British pharmacists generally, may fairly congratulate themselves on the paper, by the learned professor of chemistry and pharmacy, read at the last monthly meeting night.

My present purpose is not to advocate the adoption of the metric system; it will come in time, under what names soever the subdivisions might be known in England. But I submit that we should have no objection to its use in pharmacy (including in that term pharmaceutical chemistry) from the public. We should, I think, have only to meet the medical profession and the older members of our own profession. And I would submit to these that the adjustment of the Pharmacopœia would be far more easy than at first sight appears. Hence the association with a given proportion of the active ingredients in a compound need not be rudely disturbed. The change of the unit would not be so very complex a process.

What is the foundation for the quantity implied by "grain" and "minim"? These are the units for both weight and volume. The unit of the metric system was true and easily found while yet a stone of the pyramids was not laid, and it must last to the end of time.

Hence, in multiplying and dividing by 10, I hope we are smoothing somewhat the devious path for students, both medical and pharmaceutical. At present, no anxiety as to manufacturing and philosophical chemistry need have place.

We surely should hardly declare ourselves against so philosophical and easy a change. Our German brethren, left (as I have been assured by a Prussian pharmacist) no less than our own body, in past years, to their own opportunities of acquiring a knowledge of their profession, would hardly award us much credit for our want of "pluck" to grapple with a thing like this.

I have said here nothing as to its adaptability at present to the daily requirements of the community.

W. H. L.

IMPROVED TINCTURE PRESS.

Sir,—I thought it unnecessary to reply to a letter signed "An Old Engineer," but several friends urged me to do so, as it assumes my ignorance of the pressure being greater on a small than on a large cylinder; or, in other words, that a total pressure on a certain superficial area would give the obvious result of so much per square inch! The fact is that only the total pressure has been taken into consideration in the course of this discussion. "An Old Engineer" is evidently prejudiced against my press; yet he confirms my opinion of its originality, simplicity and economy, and, not finding anything to say against its principle and construction, condemns the materials and workmanship as unequal to the power of the implement, in which opinion I cordially agree.

However, it was not to reply to this that I once more trespass on the valuable pages of your journal; but, finding myself involved in a rather serious private correspondence on the subject, it will save much unnecessary trouble if allowed to inform your readers that I am not a manufacturer of, or dealer in tincture presses, but will be pleased to continue to give any information that may be required.

Fulham, S.W., December 11th, 1871. C. A. STAPLES.

THE PRELIMINARY EXAMINATION.

Sir,—The communication from "Veritas" in last week's Journal gives me possession of facts which I would gladly have known before. He informs me that *N. B.*'s master (who, I am glad to see, shares similar opinions with myself respecting him) was unaware of that gentleman's kind attempt to sound his master's trumpet in conjunction with his own.

Now, although I greatly regret giving offence to any one, and willingly retract the objectionable sentence, seeing that it causes "so much pain and annoyance," I may perhaps be allowed to assert, without fear of bringing any further reprovals upon myself, that my remark was a most natural conclusion to draw, when such words were inserted as "now with Mr. J. M. W., Pharmaceutist, Oakham," previous to the glowing account of the examination, for, as a rule, a small amount of credit is reflected on a master when one of those under his charge shows a proficiency in any examination.

In regard to the quotation from Byron to which "Veritas" so kindly treats me, I beg to remind him that even if "critics all are ready made," they have no less power for that reason, —a power which, if rightly used, works infinite good. Could Byron have seen the late controversy on his own character he would, perhaps, have given "Veritas" a few still more sarcastic lines to quote.

In conclusion, let me thank "Veritas" for giving me the opportunity of showing how fair in criticism I wish to be.

December 12th, 1871. W. H. J.

[*⁎* We think that sufficient space has been given to this subject, and the correspondence must now cease.—ED. PHARM. JOURN.]

J. L. W.—You may obtain what you require from any manufacturer of chemical apparatus.

T. A.—Mohr and Redwood's 'Practical Pharmacy.'

W. Sandall.—Fresenius's 'Quantitative Analysis' is a good work on the subject. Quantitative analysis is not an easy operation, and there is no easy book for teaching it. To perform it properly, the operator requires to have a thorough knowledge of chemistry.

"Veritas."—(1.) The Preliminary Examination can only be passed, either in the country or in London, on the days specified in the official notice. See first page of wrapper. (2.) The last edition was published in 1851.

W. D. Williams.—You will find answers to your question in PHARM. JOURN. 3rd ser. vol. i. pp. 377, 397.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. J. J. Nicholson, Mr. J. Hallawell, Mr. R. Bannister, Mr. J. C. Brough, Mr. Chandler, Mr. E. Rimmel, Mr. J. Bradshaw, Mr. T. Appleton. Mr. Stokes, Mr. W. Hills, Mr. W. J. Smith, Mr. A. W. Bennett, "A Commercial Traveller."

"A Yarmouth Member" and "A Country Chemist" have not complied with the rule respecting anonymous communications.

THE EDUCATION OF PHARMACISTS.

BY ONE OF THE FRATERNITY.

The Board of Examiners has just presented to the Council a report, relating to the Preliminary Examination, that reveals a very deplorable state of affairs. We learn from it that an average exceeding 35 per cent. of the youths who presented themselves at four examinations held by the Board failed to exhibit evidence of having received any education whatever. Those who have been curious enough to look over the questions which have been published, will have seen what a very slender stock of erudition will enable a youth to get his certificate. In fact, so slight is the acquaintance with each subject which is expected, that one might be inclined to fall out seriously with the Board upon the matter, were it not for the fact that there still remains a residuum of that class, for whom there is so much clamour for sympathy, on the ground that they had already entered upon the business at the time of the passing of the Pharmacy Act.

It is inconceivable that there should be any doubt about the advisability of a preliminary examination. Those who have the best possible opportunity of judging, namely teachers and examiners, know full well that all the difficulties which arise in subsequent examinations spring from imperfect elementary school training. More than this, masters also must be blind indeed if they do not see every day that their best assistants are those who possess, not merely a superficial acquaintance with the details of their business, but a good general education,—who can write a good hand, cast accounts and keep the books neatly, dispense smartly and intelligently, and show to their customers a ready knowledge of whatever questions may be proposed to them.

Take the subject of Latin, for an instance. A prescription comes in for pills to be taken "hâc et crastinâ nocte." The assistant is alone, and the result of his feeble knowledge of Latin is that the patient is told to "take these to-morrow night;" so either missing one dose of the two that he ought to have, or getting twice as much as he should do to-morrow. This is an instance of what has actually occurred, and the same kind of thing happens day after day. To say no more about the necessity of a little classical knowledge to all pharmacists, because it is self-evident, it is impossible to refrain from pitying the student who begins to work at botany, or any other branch of natural history, without some slight acquaintance with both Latin and Greek.

English grammar and composition are down in the synopsis issued by the Examiners. Justly so, and, in the opinion of many people, they ought to take first rank. But while confessing to a strong leaning in the same direction, it must be admitted that every candidate ought to be required to show a certain familiarity with standard English literature, for with all due respect to Messrs. Lindley Murray and Co., it is only from that source that a knowledge of English grammar and composition can be usefully derived. It is not to be expected that boys of 16 to 20 should be able to handle the pen of Macaulay, or display the elegance of Charles Lamb, but they ought all to be able to write a decent letter in a decent hand, and describe in an intelligible and connected style what they may have seen, or what they think about a given subject. It can surely be no advantage to a man who wishes to inspire his customers with a respect for what he conceives to be his superior scientific attainments, if he communicates with them in vulgar or ungrammatical language, with a carelessness of aspirates or neglect of common syntax rules. He is more likely to get a name the reverse of that to which he aspires.

Those possessing some considerable experience as teachers, would say that for students of chemistry there is no more desirable accomplishment than a modicum of mathematics, nor one that is more commonly wanting. In this respect the writer's experience differs from that of the Examiners, whose report asserts that arithmetic is nearly always well done at the examinations. It would be a shame indeed if it were not. The greater part of the questions set are so trivial, that a sharp child of ten years would do the whole easily. But the complaint to be made is that while three-fourths of existing students of pharmacy cannot manage simple rule of three, about the same proportion have no acquaintance with such things as decimal points, To expect such pupil to have any idea of the fundamental nature of an equation, or ever to have dreamt of the first rudiments of algebra, would be indeed an enormity. And yet at the threshold of the study of chemistry rises up a big stumbling-block, which nearly all beginners blunder and hurt themselves over, simply because they never heard of such a thing as a symbol before, and have to grapple with an idea to them absolutely new. It is really almost too bad to put material of this kind into the hands of a teacher and say, "Make a chemist of this boy." The teacher can hardly be expected to get up much enthusiasm when he has to halt every now and then to give a lesson in arithmetic.

Then comes the question, what is the cause of all this, and how can it be remedied?

The answer is plain. The parents and guardians of these unlucky youngsters, being in most cases themselves ignorant people, have never seen the use of having their boys taught anything. A venerable individual who had made a considerable fortune as a currier, used to ask what was the good of such rubbish as French and drawing, because he had got on very well without them? That sort of thing was possible; times are changed since, and "the three *Rs*" must be laid hold of if a man wants to live in this world. To have learnt thoroughly the "ingenuas artes" not only "emollit mores," but it requires time. Those in authority who suggest such things as "polishing up," and advise a month or two of reading Latin grammar, are to a certain extent responsible for the continuance of the wretched state of things to which we have drawn attention. If a man's education has been neglected, it is *impossible* that he can recover the lost ground in a few months, it can be done only by patient application for a year or two.

But it may be asked, What is all this about? It is simply this—there is a great question staring the pharmacists of this country (and, indeed, others) in the face. What kind of position is the pharmaceutical practitioner to take in the up-springing generation? Is he to remain on a level socially with his next-door neighbour the oilman and the greengrocer; or is he to be an educated and intelligent man, not merely respectable and respected as a trader, but second only to the physician himself in professional dignity or social and scientific importance? This question remains for solution by the members of the pharmaceutical body. They have the world full of young men before them, they can choose, as they please, either the idle and the dull or the active and the intelligent. But whichever they elect into their ranks, the recruit, be it always understood, has no rights when he enters beyond those of every citizen. The way then is clear: if it is really the ambition of chemists and druggists to improve the position of their body, they must do what they can to make the body deserving and capable of advancement. And this can be done only in one way. They must see that they do not assist in any way towards admitting fresh incapables into the trade which they would fain see elevated in status, or even modified into a profession. It is no exaggeration to affirm, that every man accepting a youth as pupil or apprentice who does not exhibit the capacity and activity necessary to enable him to master every detail of his calling, is doing an injustice to the boy, an injury to the community, and is deliberately balking those efforts which have been, with increasing success, carried on for the last thirty years. Nothing now stands in the way of the pharmacist but himself. It is earnestly to be hoped that better things will in time arise. But, meanwhile, there is the Preliminary examination to be faced. Let every chemist and druggist throughout the country make it a rule to take no apprentice who has not passed that test satisfactorily, and then a great step will have been gained. Further doings can be spoken of afterwards.

Youngsters themselves may be warned that the examination is not the end; they should not regard it as such. They should not go near the examiners till they are at home in every subject, for they may depend upon it, that without possessing, and being able to use, the knowledge which the passing of this examination is supposed to guarantee, the mere acquisition of the certificate will only make fools of them.

LIQ. MAGNESIÆ BISULPHITIS, A REMEDY FOR CARDIALGIA (HEARTBURN).

BY GEORGE ARCHBOLD, D.SC.

Some time ago a physician asked me the question, "Do the bisulphites prevent the butyric acid fermentation?" In order to give him an accurate answer, I promised to try two experiments. This I did. First, I proceeded to make butyric acid by fermentation of a mixture of chalk, cheese, and honey and water, and allowed the mixture to stand for four days. Secondly, in another vessel I proceeded in the same manner, using the same ingredients, with an addition of bisulphite of lime; set it aside for four days with the first, keeping them at a temperature of 80° F.; after which I subjected each to distillation with a little H Cl.* From the *first* I recovered a considerable amount of butyric acid, but from the second (containing bisulphite) I did not recover a trace. This at once proves that the bisulphites do prevent butyric acid fermentation. Now the object in ascertaining the fact was that a suitable remedy for heartburn might be discovered, as, according to Dr. Leared, this common complaint is due to the presence of butyric acid in the stomach. "On considering the taste," says that gentleman, "experienced, as well as the conditions under which heartburn comes on, it seemed to me that the cause of it was the presence of butyric acid;" and from many experiments performed by that gentleman on himself and others by means of the pure acid, symptoms were produced in every respect similar to the complaint itself, so that there can be little doubt but that his theory is a correct one. The very fact that alkalies give relief prove its cause to be from an acid. When the stomach is overtaxed, and in certain weak conditions of digestion, fermentation takes place; butyric acid is set free from the food, *i. e.* it is formed out of its own elements, if the food be of a starchy nature; and, according to Leared 'On Imperfect Digestion,' page 249, "the acid, by being in excess, but not pure (or it would be soluble), rises to the surface of the contents of the stomach, when it combines with melted fats (for which it appears to have a strong affinity); the acrid mixture, on being presented to the cardiac orifice by the motions of the stomach, is instinctively rejected into the œsophagus, and, by the reversal of its proper movement, transmitted to the mouth, accompanied by the sensations of heartburn." Now, as bisulphites have the power of preventing this fermentation, they are well worthy the attention of the profession, but the great drawback is that the chief bisulphite manufactures are those of lime, soda and potash, these being objectionable, as they tend to injure the coats of the stomach. To remedy this failing, the thought at once suggested itself to me that a bisulphite of magnesia might be prepared; and magnesia being free from these objections, it may prove a valuable remedy, and is worth notice. I have not seen or heard anything of the preparation previous to my making it. I therefore give a brief outline of the process I adopt, and hope to enter more fully into the subject at a future time. I first treat magnesia carbonate with B. P. sulphurous acid, which, on evaporation, yields magnesia sulphite, $Mg\,S\,O_3$, which is not very soluble in distilled water. I then mix the sulphite of magnesia thus formed with distilled water, in the proportion of 16 grs. to ℥j, and pass into it sulphurous anhydride until a clear solution is obtained. The result is a solution of magnesia bisulphite.

The dose may be one tablespoonful, containing about nine grains of the salt; its action is a mild aperient antiseptic, preventing butyric fermentation in the stomach, etc. I have tried it myself and on two other gentlemen, and, as far as I can judge, it has the desired effect.

* For the first two days lactic acid is formed, which combines with the lime, but at the expiration of four days, the lactate of lime is replaced by butyrate of lime, which on being distilled with dilute hydrochloric acid, and the distillate treated with calcium chloride, is dried into two strata, the upper being butyric acid.

THE USES OF THE GENUS CYPERUS.

BY JOHN R. JACKSON, A.L.S.

Curator of the Museums, Kew.

Few Natural Orders are less important in a medicinal or economic point of view than the *Cyperaceæ;* amongst its British representatives there is scarcely a plant of any real value. Botanically, the genus *Carex* is the most important, no less than fifty-eight species being recorded as British. Of *Cyperus* itself two species only occur with us,—*C. longus*, L., and *C. fuscus*, L., but both of these are very rare; the rootstocks of the former, which are aromatic, were, at one time, used as a tonic and stomachic. The tubers of several species are used both medicinally and for food in India; those of *C. bulbosus*, Vahl—a plant growing in sandy situations near the sea on the Coromandel coast—are eaten either roasted or boiled, the skins being rubbed off between a cloth; they are said to taste like potatoes. Sometimes they are dried in the sun and ground into flour, from which bread and other articles of food are made. Stewed, or used in curries, they are also reputed to be very good.

Cyperus rotundus, L. (*C. hexastachys*, Rottl.), is another Indian species, common in moist localities throughout the empire; the tubers of which are about the size of a pigeon's egg, and are sold in the bazaars; they are white, friable and spongy, having a sweet, aromatic odour, and a bitter, balsamic and resinous taste. They are used by perfumers on account of their fragrance, and by native practitioners as a tonic and stimulant, and in cases of cholera. In a fresh state they are employed for making an infusion, which is given as a demulcent in fevers, and in cases of dysentery and diarrhœa.

An account is given in the *Calcutta Med. Phys. Transactions* of two cases of cholera alleged to be successfully treated with them.

The entire plant is much relished by cattle, and hogs are very fond of the roots.

The roots of *C. odoratus*, L., have a warm and strongly aromatic flavour, and are used in native practice as a stomachic; those of *C. pertenuis*, Roxb., are likewise aromatic, and are used when dried and powdered by Indian ladies for cleaning and perfuming the hair; they are also regarded as diaphoretic and diuretic. *Cyperus repens*, Ell., is cultivated about Charleston, and the sweet roots are largely sold as an edible under the name of grass nut. *C. hydra*, Mx., has become a great pest in some parts of the southern States of America; the plant is in no way useful, but is very difficult to eradicate.

C. esculentus, L., is perhaps the best known of all the species; the tubers, which are mealy, have a very aromatic and agreeable flavour, and are used as food in the South of Europe; they are called by the French, "*Amande de terre*." In Madrid, during the hot weather, they are a regular article of trade, and are sold under the name of *Chufas*, for making a cooling drink; for this purpose they are soaked for two days in water, after which they are powdered, and the liquid strained off and frozen, the result being a most pleasant and refreshing drink.

OIL OF WINTERGREEN.

BY DR. J. E. DE VRY.

In reading the note on "Oil of *Andromeda Leschenaultii*" on page 285 of this Journal, I supposed it would be of some interest to publish some experiments on a similar subject which I made in 1859 when I was in Java. The presence of large numbers of *Gaultheria punctata* and *Gaultheria leucocarpa* on the tops of many volcanoes of that island having attracted my attention, I collected the leaves of both of them on the extinct volcano Patoea, with the view of ascertaining the amount of essential oil to be extracted from them by distillation.

65 pounds of fresh leaves from *G. leucocarpa* yielded 40 grams of oil, amounting to about 0·012 per cent.

59 pounds of fresh leaves from *G. punctata* yielded 340 grams of oil, amounting to about 1·15 per cent.

Both these oils are almost identical with the American wintergreen oil, as I found them to consist chiefly of methyl-salicylic acid. I brought them home, and presented them to the chemical collection of the Polytechnic School at Delft.

If wintergreen oil is really in great request by certain manufacturers, I suppose it would be made with profit in Java from *G. punctata*.

As Zwenger found quinic acid in the leaves of *Vaccinium Myrtillus*, I supposed that both the species of *Gaultheria* mentioned as belonging to the same natural family, might contain the same acid. Therefore, after distilling the oils, I examined the residue in the still, and found the expected quinic acid, as was proved by its deviation of the plane of polarization to the left and by the production of hydrochinon, if treated with manganese and sulphuric acid.

VESICATING INSECTS.

BY M. C. COOKE, M.A.

(*Continued from page* 424.)

North American Cantharides.

Black Blister-Fly, *Lytta atrata*, Oliv.; entirely black and immaculate.—Oliv. Ent. t. 2. f. 19; Durand, Journ. Phil. Col. Pharm. ii. p. 274. f. 7; Wood and Bache, Disp. U.S. (1867) p. 206; Harris, Injurious Insects (1862) p. 139. f. 64. *Lytta atrata*, Fabr. Sys. p. 260; Brandt and Ratzb. ii. t. xviii. f. 9. *Cantharis pennsylvanica*, De Geer, Mem. v. t. 13. f. 1. *Epicauta pennsylvanica*, Leconte, Cat. Col. U.S.

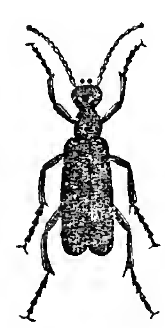

Fig. 9.—*Lytta atrata.*

Found in North America, Carolina and Pennsylvania.

The black *Cantharis* is smaller than the other indigenous species, but resembles *C. marginata* in figure. Its length is only four or five lines. It is distinguished by its size and its uniform black colour. It frequents more especially the different species of *Aster* and *Solidago*, though it is found also on *Prunella vulgaris*, *Ambrosia trifida*, and some other plants. Mr. Durand met with considerable numbers of this insect near Philadelphia in the month of September; and they continued to appear till the middle of October. They are common in the Northern and Middle States, but are not confined exclusively to this country, being found also in Barbary. Drs. Oswood and Harris, of New England, satisfactorily ascertained their vesicating powers. They are probably identical with the insect noticed as vesicatory by Professor Woodhouse, under the name of *Meloe niger*.

This species is thus noticed by Harris in his 'Insects Injurious to Vegetation.'

"About the middle of August and during the rest of this and the following month, a jet-black *Cantharis* may be seen on potato-vines, and also on the blossoms and leaves of various kinds of golden-rod (*Solidago altissima*), which seems to be its favourite food. In some places it is as plentiful in potato fields as the striped and margined *Cantharis*, and by its serious ravages has often excited attention. These three kinds, in fact, are often confounded under the common name of potato flies; and it is still more remarkable that they are collected for medical use, and are sold in our shops by the name of *C. vittata*, without a suspicion of their being distinct from each other. The black *Cantharis* or *C. atrata* is totally black, without bands or spots, and measures from $\frac{4}{10}$ to $\frac{1}{2}$ inch in length. I have repeatedly taken these insects in considerable quantities, by brushing or shaking them from the potato vines into a broad tin pan, from which they were emptied into a covered pail containing a little water, which, by wetting their wings, prevented their flying out when the pail was uncovered. The same method may be employed for taking the other kinds of cantharides, when they become troublesome and destructive from their numbers; or they may be caught by gently sweeping the plants they frequent with a deep muslin bag-net. They should be killed by throwing them into scalding water for one or two minutes, after which they may be spread out on sheets of paper to dry, and may be made profitable by selling them to the apothecaries for medical use."

The black blister-fly is one of the species recognized in the United States Dispensatory, and is commonly employed in the Northern States.

Nuttall's Blister-Fly, *Lytta Nuttallii*, Say; bright green, varied with golden; elytra golden-purple; feet black; thighs blue; trochanters armed with a spine.—*L. Nuttallii*, Journ. Acad. Nat. Sc. iii. p. 300; Say's 'Entomology,' i. p. 5. t. iii. f. i.; Wood and Bache, Disp. U. S. p. 207.

Body glabrous. Head deep greenish, varied with golden. Front punctured, subimpressed, and with a small rufous spot. Antennæ robust, surpassing the base of the thorax, black, opaque. Joints turbinate, approaching to moniliform; the margin of the tip rounded; second joint two-thirds of the length of the third; terminal joints largest near the middle, and rapidly attenuated to an acute tip. Eyes oblong-oval, emarginate. Palpi black. Clypeus and labrum obscure. Thorax golden-green, polished with unequal, minute, sparse punctures; a longitudinal, dorsal, impressed line, and a transverse basal one. Base bluish; anterior angles prominent. Scutel blue, obtuse behind. Elytra red or golden-purple, somewhat rugose; two indistinct elevated lines on the disk and a submarginal one, beneath green, polished. Feet black. Thighs beneath blue or purplish. Trochanters armed with a conic spine near the inner base, obsolete or wanting in the female.

A noble species which, in magnitude and splendour, is said to surpass the famed *vesicatoria*. It seems to have the habit of *Lytta*, combined with a form of antennæ allied to that of *Mylabris*. Say writes thus concerning its discovery:—"In company with Major Long, I observed it, for the first time, near the base of the Rocky Mountains. A very numerous flock had there taken possession of the few diminutive bushes that occurred within the space of a hundred yards, every spray of which was burdened with their numbers. After passing this limited district, not an individual was seen during the remainder of our journey. On the recent expedition of the same officer to the river of St. Peter, I obtained but a single specimen, which was found one evening at an encampment in the N. W. Territory."

According to the American Dispensatory this species bids fair, at some future period, to be an object of importance in the Western States. Colonel Long ascertained its vesicating powers, and in one place is said to have found it so numerous and troublesome as to be swept away by bushels in order that a place might be found for encamping.

(*To be continued.*)

OBSERVATIONS IN PRACTICAL PHARMACY.*

BY CHARLES SYMES, PH.D.

Evening meetings are usually the most unsatisfactory part of societies; all feel this to be the case, and yet all do not equally endeavour to provide a remedy which we know is to a great extent in our own hands. Mr. Vizer, in a letter to the Pharmaceutical Journal a few weeks since, suggested that on these occasions we should soar higher than the objects of every-day life, and invite some of the great men of science to enliven our latent energies, and so increase the attendance; this idea is not altogether a bad one, but if we depended on such stimulants, it would soon be evident that the object for which we meet would, in a great measure, have become frustrated, the resultant good (as affecting the whole profession) would not be equivalent to our numerical strength. One of my earliest associations with the Pharmaceutical Society was attendance at an evening meeting at Bloomsbury Square, when Dr. Redwood read a paper on "Citrate of Magnesia" (some twelve or thirteen years since). I never saw a meeting better attended; the subject was commonplace enough, but one of practical importance to the pharmaceutist. Again, when two of us meet together and talk over the many little difficulties which daily present themselves, the means by which we render simple processes more simple, difficult processes less so, we return to our duties with renewed energy, a better feeling and more loyalty towards the cause of pharmacy. Now it is my opinion that our evening meetings should, to a large extent, be a development of this communion, and the result a similar profitable gratification intensified.

This then must be my apology for bringing before you the following practical subjects this evening.

Soap Liniment is a preparation which at one time received much attention, but which remains very much as it was, an unsatisfactory one. Messrs. Southall and Co. were the first to call my attention to a soap which they had prepared, which was entirely soluble in the proportions of spirit and water ordered by the B. P. (18 and 2), and which remained bright down to a temperature of 32°; the same soap, however, kept for two or three months, did not fulfil these conditions. A little reflection made the cause evident. In its fresh state, this in common with all other soaps contains a large proportion of water, so that practically we in using it are adding rather more water and rather less soap, and so make the Pharmacopœia preparation what it really should be; and in using this soap when dry and hard, it is necessary for uniformity and for getting a satisfactory preparation, to use rather less soap and rather more water. Mr. Wood introduced to our notice an almond oil soap, which I have prepared, and found to answer admirably, keeping bright at any temperature to which I have exposed it; but I have no experience of its use when old and hard. A liniment prepared with Pharmacopœia soft soap (using the proper proportions of spirit and water) also keeps well, and appears to possess as much therapeutic value as that prepared from hard soaps, still we are scarcely justified in using it when the Pharmacopœia directs the latter.

Syrup of Phosphate of Iron.—The length of time which this preparation might be kept without change is said to be entirely dependent on the acid from which it is prepared being freshly diluted or otherwise. I have found a slight modification of a United States formula answer well for the preparation of the syrupy or dilute acid. Dissolve 1000 grains of glacial phosphoric acid (free from phosphate of ammonia) in 6 ounces of distilled water, add 1 drachm nitric acid, and boil down, in a porcelain dish, to the consistence of a syrup, or until all the nitric acid disappears. When nearly cold, it might be diluted if required for immediate use, so as to produce

* Read at a Meeting of the Liverpool Chemists' Association, Nov. 23, 1871.

22 fluid ounces, which will correspond with the acid. phosph. dil. of the B. P.

Syrup of the Phosphates (Parrish's Chemical Food).—This preparation, as sent out by the original maker, varies considerably in appearance, sometimes being of a bright crimson, sometimes of a dark mahogany colour; but he having published his formula, cannot, of course, retain it as private property, and the preparation is now largely made, both by wholesale and retail houses, and more uniformity appears to exist in consequence.

The operation is comparatively simple, and yet occasional difficulties present themselves, either in getting the whole of the phosphates dissolved without an excess of acid, in getting the whole of the sugar dissolved without its settling as a gummy, tenacious and partly insoluble mass, or in preventing a deposit of some of the phosphates when completed. (Parrish's own make frequently contains a deposit.) I manipulate as follows:—First dissolve the glacial acid in a very small quantity of distilled water, precipitate the phosphates of iron and lime, taking care with the latter not to add ammonia in excess, and slightly acidulating the water used in washing with hydrochloric acid; with a small quantity of the concentrated solution of phosphoric acid neutralize the potash and soda, and in the remainder dissolve the above precipitates—mix and measure; the quantity of water which it would be necessary to add to make up the required bulk of fluid, will be found sufficient to form separately, with the sugar, a thick syrup; slightly acidulate this with a few drops of hydrochloric acid, add the cochineal, and into it filter the solution of the phosphates, add the orange-flower water, strain through flannel, and the whole is completed. This syrup has a beautiful crimson colour, is always uniform in appearance and taste, keeps well, and is essentially in every particular syr. ferri phosph. co. (Parrish's)—or Parrish's Chemical Food.

(*To be continued.*)

CONTRIBUTIONS TO THE HISTORY OF THE OPIUM ALKALOIDS.*

BY C. R. A. WRIGHT, D.SC.

Lecturer on Chemistry in St. Mary's Hospital Medical School.

PART III.

(*Continued from page* 486.)

2. *Action of Water on the foregoing Compounds.*

When either of the two first compounds just described is dissolved in a large bulk of hot water, and the solution allowed to cool, solid white flakes are obtained containing more C and H, and less I, than the original substance. By repeating this treatment several times successively, the same ultimate compound appears to be produced in each case, being apparently formed by the reactions—

$$C_{68}H_{86}I_2N_4O_{12}, 4HI = 2HI + 2H_2O + C_{68}H_{80}N_4O_{10}, 4HI.$$

$$C_{68}H_{82}I_2N_4O_{10}, 4HI = 2HI + C_{69}H_{80}N_4O_{10}, 4HI.$$

The removal of the last traces of basic HI is very difficult; it may be accelerated by adding a few drops of sodium carbonate to the boiling solution and filtering hot from the small amount of precipitated base; the product is apt, however, to be more strongly yellow-coloured when obtained in this way than when got by treatment with water alone.

Specimen A. Got from compound $C_{68}H_{82}I_2N_4O_{10}, 4HI$ by water and a little sodium carbonate:—
0·366 grm. gave 0·672 CO_2 and 0·177 H_2O.
0·406 grm. gave 0·227 AgI.

Specimen B. From same compound by water alone:—
0·369 grm. gave 0·674 CO_2 and 0·174 H_2O.
0·4555 grm. gave 0·2675 AgI.

Specimen C. From compound $C_{68}H_{86}I_2N_4O_{12}, 4HI$ by water alone:—
0·4265 grm. gave 0·762 CO_2 and 0·220 H_2O.
0·3845 grm. gave 0·2275 AgI.

	Calculated.		Found. A.	B.	C.	Mean.
C_{68}	816	50·25	50·08	49·81	48·73	49·54
H_{84}	84	5·17	5·36	5·24	5·73	5·41
N_4	56	3·45	—	—	—	—
O_{10}	160	9·85	—	—	—	—
I_4	508	31·28	30·21	31·74	31·98	31·31
$C_{68}H_{80}N_4O_{10}, 4HI.$	1624	100·00				

Specimen A, dissolved in hot water and precipitated by sodium carbonate, yielded a yellowish-white substance, rapidly becoming darker, and finally almost black. Dried rapidly at 100°:—

0·370 grm. gave 0·930 CO and 0·235 H_2O.

About 0·5 grm. examined qualitatively for iodine gave only traces of AgI.

	Calculated.		Found.
C_{68}	816	68·46	68·55
H_{80}	80	6·71	7·05
N_4	56	4·70	
O_{15}	240	20·13	
$C_{68}H_{80}N_4O_{10} + O_5$	1192	100·00	

From these numbers it appears that the free base, like bromo- and chloro-tetra-codeia, rapidly absorbs oxygen from the air.

Probably there exists a compound intermediate between the hydriodate just described and the original body—

$$C_{68}H_{82}I_2N_4O_{10}, 4HI;$$

thus one batch of flakes got by two treatments with water of this original substance gave the following numbers after drying at 100°:—

0·3225 grm. gave 0·556 CO_2 and 0·153 H_2O.
0·3205 grm. gave 0·212 AgI.

Another specimen obtained similarly:—
0·4175 grm. gave 0·269 AgI.

	Calculated.		Found.	
C_{68}	816	46·58	47·2	—
H_{85}	85	4·85	5·27	—
I_5	635	36·24	35·75	34·82
N_4	56	3·20		
O_{10}	160	9·13		
$C_{68}H_{81}IN_4O_{10}, 4HI$	1752	100·00		

It is not impossible that this substance is not a definite compound, but only a mixture; nevertheless, a free base of this composition and its hydriodate have been obtained by the action of sodium carbonate on the compound,

$$C_{68}H_{86}I_2N_4O_{12}, 4HI;$$

from whence it appears probable that the body analysed is really a definite compound, formed by the reaction,

$$C_{68}H_{86}I_2N_4O_{10}, 4HI = HI + C_{68}H_{81}IN_4O_{10}, 4HI.$$

Both the final and intermediate products have a very curious structure under the microscope; although they simulate in a high degree the appearance of crystals as they separate from a hot aqueous solution, yet on microscopic examination they are found to consist of strings

* Read before the Royal Society, November 16, 1871.

of coalesced globules not unlike the yeast-plant. In qualitative reactions all the bodies hitherto described are very similar: ferric chloride gives no coloration to the aqueous solution of the hydriodate; silver nitrate is reduced on standing, producing a yellow tint; nitric acid gives an intense yellow; sulphuric acid and potassium dichromate only separate iodine: sodium carbonate throws down a white precipitate scarcely soluble in excess, and soon becoming yellow, salmon-colour, and finally dark brown; ammonia gives a similar precipitate somewhat more soluble in excess, while caustic potash readily dissolves the white precipitate first formed. In many of these reactions this group of codeia derivatives utterly differs from the bodies got by the action of HCl or HBr: most of these latter derivatives give colours with ferric chloride and sulphuric acid and dichromate; all give a blood-red with nitric acid, while the free bases turn more or less *green* by exposure to air.

On similarly treating with boiling water the compound $C_{68}H_{82}I_2N_4O_6, 4HI$ formed by the action of hydriodic acid on codeia at about 130°, a substance similar in characters to that got from the other two compounds is produced; the final product, however, differs somewhat in its physical characters from those just mentioned; instead of coming out from the hot aqueous solution in solid flakes, it appears in very minute solid oil globules which do not readily subside, and give to the liquid a great resemblance to fresh milk; sometimes the globules do not subside for many days.

Dried at 100°, these globules give numbers indicating a compound analogous to that of the non-iodized base just described; it is, however, much more difficult in this instance to remove the last portions of basic HI; moreover, 4 molecules of water appear to be taken up, probably in lieu of the oxygen lost.

Specimen A. Original substance treated three times with large excess of water—

0·3315 grm. gave 0·589 CO_2 and 0·175 H_2O.
0·299 grm. gave 0·178 AgI.

Specimen B. Original with water four times—

0·321 grm. gave 0·585 CO_2 and 0·169 H_2O.
0·411 grm. gave 0·754 CO_2 and 0·218 H_2O.
0·2835 grm. gave 0·165 AgI.

Specimen C. Original with water five times—

0·4095 grm. gave 0·740 CO_2 and 0·219 H_2O.
0·3995 grm. gave 0·237 AgI.

	Calculated.		Found. A.	B.		C.	Mean.
C_{68} . .	816	50·00	48·46	49·71	50·03	49·68	49·47
H_{92} .	92	5·64	5·87	5·85	5·89	5·94	5·89
I_4 . .	508	31·13	32·17	31·45		32·06	31·86
N_4 . .	56	3·43					
O_{10} . .	160	9·80					
	1632	100·00					

$C_{68}H_{88}N_4O_{10}, 4HI$.

Hence this compound is to be formed by the reaction—

$$C_{68}H_{82}I_2N_4O_6, 4HI + 4H_2O = 2HI + C_{68}H_{88}N_4O_{10}, 4HI.$$

Carbonate of soda threw down from Specimen C. a white precipitate, becoming yellow on standing: this precipitate contained a small amount of iodine, showing (as the above numbers indicate) that the transformation of the original substance was not absolutely complete.

The qualitative reactions of this substance are the same as those of the bodies previously described.

(*To be continued.*)

NEUTRAL SULPHATE OF PHYSOSTIGMATIN.

In consequence of the frequent use by practitioners specially devoted to the treatment of diseases of the eye of neutral solutions of physostigmatin or eserin, and the difficulty of obtaining that alkaloid in a state of purity, the author has been led to investigate the subject, and describes a direct process for preparing solutions of neutral sulphate of physostigmatin. One part of hydro-alcoholic extract of Calabar bean is dissolved in four parts, or a sufficiency, of distilled water, and the solution filtered. The small residue which remains in the filter contains none of the alkaloid. One gram of bicarbonate of potash is added to each twenty grams of the extract, and agitated with an excess of ether. The ether becomes distinctly alkaline, and may easily be separated by reversing the bottle, and allowing the aqueous liquor to run away. After standing a short time, so that it may contain no trace of the bicarbonate of potash, the ether, charged with physostigmatin, is poured into another bottle. To this a small quantity of distilled water is added, and then, drop by drop, a titrated solution of sulphuric acid, containing as nearly as possible forty grams of monohydrated sulphuric acid (SO_3HO) to the litre; so that one drop, or 0·05 gram, would correspond to the quantity of physostigmatin necessary to form 0·01 gram of neutral sulphate of physostigmatin. It should be shaken after the addition of each drop, and the point of saturation ascertained by the use of litmus paper.

The aqueous solution is then separated, and the ether, which has parted with the whole of the physostigmatin, is returned to the original and as yet only partially exhausted aqueous solution of extract of Calabar bean. After being agitated and becoming again charged with the alkaloid, it is removed as before, and added to the aqueous solution of neutral sulphate, which, upon the addition of the requisite number of drops of sulphuric acid, takes up all the physostigmatin it contains. This operation, three or four times repeated, will be sufficient to exhaust the solution of the extract, and the same ether will serve throughout.

This solution would suffice for medical purposes, but, to obtain the sulphate in a state of great purity it should be treated in exactly the same way as the original mother liquor. The solution of sulphate of physostigmatin so obtained gives, when evaporated to dryness, elongated prismatic microscopic crystals, but in general the liquors are heated in a water-bath, to evaporate the ether and alcohol they contain.

By adding sufficient water to obtain as many grams as it has been necessary to use drops of sulphuric acid, a solution is obtained containing one centigram of physostigmatin to the gram. One drop of a collyrium containing one gram of this solution to nine grams of distilled water decidedly contracts the pupil, but the quantity generally used is two grams of the solution to eight grams of water.

The author reports that he has obtained very fine crystals of iodide of physostigmatin, by adding tincture of iodine to a solution of sulphate of physostigmatin.—*Journal de Pharmacie et de Chimie.*

PREPARATION OF SULPHURETTED HYDROGEN.

BY JOHN GALLETLY.

In making some experiments on the action of sulphur on paraffin, I have found that a mixture of these substances, either in equal parts or with a larger proportion of sulphur, when heated in a flask not greatly above the melting-point of the sulphur, begins to evolve sulphuretted hydrogen, and continues to give off this gas steadily, while kept moderately heated, for a considerable time.

I have used this process repeatedly, and consider it the most convenient for laboratory use. With a round flask holding about a pound of the materials fitted with a tube bent at right angles about ½-inch bore and 12 to 18 inches long, containing a little loose cotton wool, and having a smaller tube fitted to the end of this for dipping into the liquid through which it is desired to pass the gas, a convenient stream can be obtained lasting several days. The production of the gas can be stopped and renewed at pleasure by withdrawing or applying the heat. An Argand lamp should be employed, or if a Bunsen is used, the top piece should be on the tube for spreading the flame, so as to avoid heating the flask on one spot. Heavy paraffin oil used for lubricating machinery can be substituted for the solid paraffin, and good results are also obtained with commercial stearic acid, but with the latter the tube conveying the gas soon becomes covered with drops of a milky liquid, which is probably water and finely divided sulphur. With paraffin the tubes remain clear and bright, except for a little sulphur sublimate close to the neck of the flask.

I observe that Reinsch recommends a laboratory process for obtaining pure sulphuretted hydrogen by heating in a glass flask equal parts of sulphur and suet. The recommendation does not seem to have been generally followed, but the advantages resulting from the substitution of paraffin for suet may lead to the more usual adoption of this process.—*Chemical News.*

MEDICINAL HERBS AND QUACKERY.*

BY ALEXANDER FORSYTH.

If there be any one sort of gullibility more rampant than another in this city of Manchester, it is that of persons placing implicit reliance upon the quackery of the uneducated herb doctor; and not on him alone, for the engine-tenter in my own neighbourhood fills up his spare hours by salving all kinds of sores, and even goes so far as to lance finger-ends that have been mismanaged before he took them in hand.

"But oh, what peril doth environ
The man that meddles with cold iron;"

for the cures thus effected are not always creditable to the practitioner. Still in the face of the fact of the Manchester Infirmary being one of the best-managed institutions in the kingdom, we constantly hear the old cuckoo cry that such-and-such an herb doctor cured scores of patients after all the leading men of the faculty had pronounced the case to be incurable. Burns laid the lash on most unmercifully when he painted Death and Dr. Hornbook discussing the merits of Buchan's 'Domestic Medicine.' With every new generation of men there arises a new crop of quacks. As, however, I am only cavilling with the herbalist, I would but remark in passing that there are apparently three classes of these unlawful practitioners of the healing art.

The first, by what Cobbett called "mere hardness of mouth," advertises himself as competent to do impossibilities,—for nothing less would do,—and of his 'Materia Medica' the world knows nothing. He addresses himself to moneyed people, and it is for such only that his *olla podrida* is provided. The second lives by the middle class, who consult herbals and doctor themselves and others by rule and order. The third has no literature, and his method of working consists in unwritten notions of old crones who have their "heal-all," and by means of a few herbs, easily obtained at the right time of the year, they confidently assert the cure of almost all complaints, as the old ballad has it,—

"Oh, they say it's sure to do it, and it's sure to do it well.
But the first thing you must swallow is the vegetable pill."

Such parties visiting the poor are to be dreaded, for they give advice gratis, and push their opinions into practice regardless of the fearful consequences of powerful medicines misapplied. To persons struck down with disease, and so unable either to cope with them in argument or keep them at a distance, that which might have been an angel's mission becomes an awful visitation.

But to return to the family herbals. Here before me lies Thornton's Guide to the natures and properties of the various plants used in medicine, etc., the plants drawn from Nature. The English and botanical names are given, the Linnean Class and Orders; the Latin and French languages are freely quoted; and what has been handed down from sire to son unchallenged is still to be seen figuring by way of information. I will just instance the author's remarks on one or two plants, such plants as the late Dr. Lindley said were of no known use to mankind. Many years ago I read in some religious book that persons sleeping under the shade of the chaste-tree became chaste. This chaste-tree should rather be called chaste-bush, for the *Vitex Agnus-castus* grows only to the size of a broom-bush on a common. Now, this good property in the *Vitex* would, to use a medical phrase, evidently be for "outward application only;" say, for a dose, a mere twig, like that of mistleto, might be hung up where its services were required. But our author of the 'Family Herbal' improves upon the doctrine of the Divine, and speaks of the four-seeded berry of the *Vitex* as monks' pepper, giving the Latin for the same, *Piper monachorum*, to confirm the respectability of the name, though Cobbett remarked that when nonsense was translated into French or Latin it was but nonsense still. So the doctor speaks of bachelors taking the *Vitex* berries, indeed, "flying to them;" this would amount to "taking them inwardly." Imagine a school-board in these days ordering a tiny besom made of *Vitex* twigs to be suspended in the class-rooms, and a few pecks of the berries scattered about for the youngsters to nibble at, just as cage birds get groundsel, shepherd's-purse and chickweed! The doctor is seen to the greatest advantage when he comes to treat of the common field orchis, *O. mascula*, where he quotes Sir John Hill's 'Materia Medica' for the following:—"A fellow known to Sir John was once every year brought before the magistrates to answer for his evil deeds, and he always excused himself by saying that orchises were then plentiful, and he could not resist eating them." The doctor says that salep made of orchis root is given in milk, and tells us in French that the root is a very remarkable one. I have gathered this plant often as well as most of the other beautiful native terrestrial orchises, but never saw such a harvest as Sir John Hill's criminal must have met with, when he ran mad with his belly full of orchis tubers. These orchis potatos would be worth the trouble to gather as medicine for the dull phlegmatic boys familiarly known by the *nom de guerre*, "Want of devil," with no force of character, who would not be at the trouble to do any harm, and could not think of the self-denial required to do any good. Now, if a meal or two of male-orchis roots would only rouse such boys into the region of vivacity, how it would delight their mothers' hearts to see them capering! But, joking apart, what faith could any sane person have in such writings as these? What I want to see in such books are the truthful opinions of practical men on things as they are, and not the transcribed nonsense of other days.

I could honestly name a very homely tree whose supple twigs have mended the manners of many boys, and could back my assertion with Scripture; for a birch rod seen in repose, as it hangs on the walls of a school, is a "terror to evil-doers;" but when it is put in motion, woe betide. This, indeed, were a rod worthy of all praise.

The third class of quacks consists of the old crones who have an idea that, if the medicine is only vegetable, it will be mild in its action and safe. I have gone into the herb market here, and bought herbs for the purpose of getting at the literature of the craft, to see what cer-

* Reprinted from the *Gardeners' Chronicle.*

tain herbs were called, and for what complaints they were reputed to be a remedy. I found none of the herb vendors so well up in the business as to know the botanical name of any one article that they sold, and many of the English names were such as have not been heard out of Lancashire lately. When any plantsman looks over the stock, and sees deadly poisons sold by the handful or even armful, and never by weight or measure, and with no reliable instructions as to the dose for an adult or for a child, the whole thing appears quite alarming. The business of the apothecary is regulated by law, and he qualifies for it; but the herbalist dispenses medicine in open market to all comers with impunity. I would not be severe upon the kindly old lady who sits by her herbs and roots all day long, and every market day, giving advice free, and charging very little for the medicinal herbs; but who can tell what fearful effects may be produced where excessive doses are given, and there is no duly qualified person ever called in to see the results? I have eaten the tubers of wake-robin (*Arum maculatum*), and know it to be an excellent vegetable, the tubers being beautifully white when boiled; but if I had eaten as much as the size of a bean of the same roots in a raw state I should have been poisoned. The whole secret of the *Arum* tubers is that the acrid principle is volatile, and goes off in boiling. In Thornton's 'Herbal,' above referred to, he speaks of doses of fresh *Arum* tubers of 10 grains taken inwardly, and that this very small dose (the 48th part of an ounce) makes the patient sweat. What a subject this fiery root would be for the herbalist to sell when fresh, while when dried or boiled it would be no better than a chip in porridge.

But strangers should come to Manchester at Whitsuntide to see the trade in nettles. Of this plant it has been said that it has dogged the footsteps of man everywhere to hang him, as it contains a strong fibre fit to make ropes of; but here it is made into beer, the liquor being sold at ½*d.* a bottle. When the scholars return from their yearly excursion to the country they come home laden with nettles; and were it not that every hair on the nettle is a poisoned sting, the plant would have become extinct long ago,—at least within thirty miles of Manchester. I have eaten the fresh nettle sprouts in spring, gathered before they got to be longer than one's finger, and they were very good plain boiled. If this practice were more common, it would lessen the crops of nettles, and turn this unhandsome plant to some good account. The public have nothing to fear from the herbalist making any mistakes in dispensing nettles. The plant has a character; there is nothing mawkish about it, and it needs very little logic to explain to the dullest comprehension that it will excite (Dr. Thornton agrees with this); indeed, I have seen lads dance with pain and without music when taking their first lessons on the nature and properties of a bunch of nettles. The dulness of the ass, the thickness of his hide, and the power of his jaw-bones, are all proved by the fact that he can eat nettles, green or dried, with impunity.

A lady lectured at Birmingham the other day on the education of women in the arts and sciences. Surely the botanical department of the "Materia Medica" would be a lady-like business, as there are already many ladies who are good authorities on our native flowering plants and ferns; and if the subject once got into a girl's school the pupils would collect the specimens, and when these were correctly named and described the girls would ever after know the plants by name, and be able to turn them to account. Reliable information on the nature and properties of culinary and medicinal herbs might from time to time be given in the columns of your valuable paper. Large sums of money are paid to herb-gatherers, and men may be seen fishing for the fleshy stems of water lilies (*Nymphæas* and *Nuphars*) and the bog hop, *alias* buckbean, *alias* water trefoil (*Menyanthes trifoliata*), and women employ themselves profitably by gathering wood sage (*Teucrium Scorodonia*), mugwort (*Artemisia vulgaris*) and horehound (*Marrubium vulgare*); and as these parties pay no rent for the land on which the herbs grow, it is by no means an unprofitable speculation.

There is a large field open for useful service in collecting, drying and preserving herbs. The herb teas are examples of leaves properly dried and preserved in canisters for use.

It may not be always easy to draw a hard and fast line between the duties of the housewife and those of the herbalist, for we read of the Scottish lady of rank superintending the manipulation of elder-flowers when she was asked in marriage to the Laird of Cockpen,—

"Lady Jane she was making the elder-flower wine;"

and Solomon's ideal of a household matron, a priceless treasure, is made to consist of a lady that looketh well to the ways of her household,—a worker,—or, as the sacred penman has it, one that eateth not the bread of idleness. Such an one would soon know plants by sight, and how to manage them.

NOTE ON THE DIGESTION OF MINERAL SUBSTANCES.*

BY RICHARD V. TUSON, F.C.S.

Professor of Chemistry in the Royal Veterinary College.

Physiologists and chemists have hitherto entertained the belief that the principal, if not the sole function of the pepsin and acid contained in the gastric juice is to render soluble the albuminoid constituents of food, and thus prepare them for the subsequent process of absorption.

Conceiving, however, that it would be extremely interesting to study the effect, if any, of the solvent constituents of the gastric juice upon mineral substances, especially those employed as medicines, I have set myself the task of investigating this subject. The inquiry is yet but in its infancy; nevertheless the results already obtained are sufficiently positive and striking to induce me to "claim date" by placing on record the following experiments:—

Experiment 1.—A mixture of calomel† and distilled water containing 2 per cent. of hydrochloric acid.

Experiment 2.—A mixture of calomel, pepsin,‡ and distilled water.

Experiment 3.—A mixture of calomel, pepsin, and distilled water, containing 2 per cent. of hydrochloric acid.

These mixtures were placed in glass vessels, and kept at 38° C. (100·2° F.), *i. e.* at about the temperature of the body, for twenty-four hours, during which time they were occasionally stirred or shaken. They were then thrown on to filters of Swedish paper, and the filtrates saturated with sulphuretted hydrogen. The filtrates from Experiments 1 and 2 remained unaltered. The filtrate from Experiment 3 yielded a precipitate of sulphide of mercury.

The results of these experiments therefore show that neither dilute hydrochloric acid (2 per cent.) nor pepsin alone is capable of dissolving calomel, but that when these agents are mixed they do effect its solution, and, consequently, that the digestion of calomel, so far as its solution in artificial gastric juice is concerned, is brought about under the same conditions as that of the albuminoids.

The importance of this observation will become appa-

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* Reprinted from the *Lancet.*

† The calomel employed in all the experiments was previously tested as to its purity.

‡ Pepsina porci, prepared by Messrs. Bullock and Reynolds.

rent, when it is borne in mind that it offers an additional explanation to those already published of the manner in which calomel enters the circulation in order that it may exercise the many therapeutic actions with which it is accredited. Whether or not oxide of antimony, sulphide of antimony and other so-called insoluble remedies, are dissolved by pepsin and dilute acid, is a problem which remains to be solved. The influence of different acids, the chemical composition and characters of the dissolved mineral, and its behaviour when subjected to dialysis, also the action, if any, of peptones on inorganic bodies, have likewise to be determined; but these matters, together with many others, will form the subject of future communications.

THE ACTION OF PHOSPHORUS DISSOLVED IN CARBON DISULPHIDE ON A SOLUTION OF BLUE VITRIOL.

BY WERNER SCHMID.*

A clear solution of phosphorus in carbon disulphide, when shaken up with excess of a solution of pure cupric sulphate, yields a filtrate which acts but slightly upon solutions of silver, or upon an acidulated solution of potassic permanganate, thereby showing that it contains only traces of hypophosphite and phosphite. It acts, however, strongly upon litmus, cane-sugar, and ammonic molybdate, owing to the presence of free sulphuric and phosphoric acids.

The spongy voluminous precipitate is washed first with water, then with alcohol, and lastly with carbon disulphide, and pressed between bibulous paper. It dissolves only partially in highly-diluted hydrochloric acid. The solution is colourless, and becomes blue by being shaken up with ammonia only in the presence of air. This shows the presence of a cuprous compound. Concentrated hydrochloric acid likewise dissolves the precipitate merely partially, yielding a brownish-yellow solution which turns blue with ammonia in presence of air, and reduces ammonic molybdate to an intensely azure-blue solution. The latter is decolorized by nitric acid, and yields a yellow precipitate. On treating with concentrated nitric acid, the spongy precipitate dissolves completely with evolution of nitric oxide and formation of cupric sulphate and phosphate. Fusion with saltpetre effects the same. Sodic hydrate evolves non-spontaneously inflammable phosphine. It follows from all these observations that the precipitate consists of cuprous oxide, cuprous or cupric sulphide, and phosphide. Minute scales of metallic copper were observed only when the solution of the copper salt was allowed to float quietly on the phosphorus solution, although no metallic copper could be detected in the precipitate.—*Journal of the Chemical Society.*

PREPARATION OF HYDROCHLORATE OF CREATININE FROM URINE.

BY R. MALY.†

A few litres of human urine are evaporated to about one-third of the original volume, and the liquid, after being decanted from the salts which crystallize out, is precipitated with lead acetate. The filtrate is freed from lead by sodium carbonate or sulphuretted hydrogen, and after having been neutralized, either with acetic acid or sodium carbonate, precipitated with mercuric chloride. The precipitate, a combination of creatinine with the mercury salt, is decomposed under water with sulphuretted hydrogen, and the liquid, after treatment with animal charcoal, is evaporated. On crystallizing the crystalline residue once or twice from alcohol, pure creatinine hydrochloride is obtained in white crusts or hard shining prisms. The same results were obtained with horses' urine.—*Journal of the Chemical Society.*

* Zeitschr. f. Anal. Chem. x. 205.

† *Ann. Chem. Pharm.* clix. 279–280.

ACTION OF HYDRACIDS ON THE QUININE ALKALOIDS.

BY W. ZORN.*

When cinchonine sulphate was heated in sealed tubes with concentrated hydrochloric acid for some hours to 140°–150°, the contents of the tubes yielded on evaporation crystals not unlike those of cinchonine sulphate, but differing therefrom essentially in their insolubility in acids. After one recrystallization these crystals do not contain a trace of sulphuric acid; their solution is strongly acid, but is no longer fluorescent. They are anhydrous. Chlorine determinations prove that they contain three atoms of chlorine, two of which are readily and completely removed by silver nitrate, the third with difficulty. The mother-liquor from the above crystals yields on further evaporation a second crop of different aspect, but also free from sulphuric acid.

Quinine sulphate similarly treated gives crystals, which also do not contain any sulphuric acid; these yield a strongly acid solution, which is non-fluorescent, and coloured only very slightly green on addition of chlorine water and ammonia. Potassium ferrocyanide produces a yellow precipitate, insoluble in excess, but soluble on boiling. The base is precipitated by ammonia, and is readily soluble in ether, also in an excess of ammonia and in boiling water. In its behaviour with ammonia and chlorine-water, and with ferrocyanide, this new body resembles cinchonine; like quinine, it is readily soluble in ether, but differs from both by its solubility in ammonia and in boiling water.

By the action of hydriodic acid on cinchonine sulphate, products are obtained, the examination of which, and of the above, the author is prosecuting.

THE EMULSION OF VEGETABLE TAR AND SAPONIN.

M. Lucien Lebœuf, in a paper published in the *Journal de Pharmacie et de Chimie*, recommends the formation of an emulsion of vegetable tar by means of saponin as a means of obviating the difficulty met with in the administration of that medicament, arising from its slight solubility in water. A tablespoonful (20 grammes) of such an emulsion containing 2 per cent. of tar would represent 0·40 grm. of tar, that is to say, the quantity contained in a litre of the hydrolate of tar of the Codex. By the addition of a little sugar the acridity of the tar is covered, and the mixture is rendered palatable.

Saponin, being a neutral substance, exercises no chemical action upon the tar, while the quantity required to effect the emulsion, about 1 part in 500 of such a preparation as that described above, is so small that M. Lebœuf considers its possible effect upon the system would be so slight as to make it unnecessary to take it into account. It is suggested that this new pharmaceutical preparation of tar, diluted more or less with water or glycerine, might be used with facility in lotions, injections and gargles, etc.

* J. pr. Chem. [2], iv. 44, and *Journal of the Chemical Society.*

THE CHICAGO COLLEGE FUND.

The following is a list of the subscriptions promised up to December 20th.

The Members of the Chicago College of Pharmacy, notwithstanding their own great losses, will themselves provide a new building. Their appeal is solely for donations of articles for the Library, Lecture-Room and Museum. English Pharmacists, unable to give books, etc., are invited to send subscriptions of money, the whole of which will be expended by the Committee in the purchase of appropriate contributions.

Parcels of Books, Specimens of Chemicals, or Articles of the Materia Medica, Apparatus and Subscriptions may be sent to Professor Attfield, 17, Bloomsbury Square, London, W.C. Cheques, crossed "London and Westminster Bank," and Post-Office Orders, drawn for "High Holborn," may be made payable to John Attfield. All Donations will be acknowledged in the Pharmaceutical Journal.

Amount previously acknowledged, £99. 8*s.* 6*d.*

	£.	s.	d.
Davy, Yates and Routledge, London	10	10	0
Henry B. Brady, Newcastle-on-Tyne	5	5	0
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Students.

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Mr. Westwood	10	6
Mr. Collishaw	2	6
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Mr. Parker.

Bowman's Chemistry.

Mr. J. Slater.

Attfield's Chemistry, 1st edition.

Mr. H. E. Godfrey.

Ciceronis Epistolæ ad Atticum.
Cicero De Officiis.
Garrod's Materia Medica.
Heller's Chemistry of Urine.
Arnold's Longer Latin Exercises.
Latin Prose Composition.
Pharmacopœia of London Physicians, 1824.

Mr. Fentiman.

Thomson's Chemistry, 2 vols.
Griffin's Chemical Recreations.

The following is a list of the books promised up to December 20th.

[Duplicates of books, lecture-specimens, etc., will be dealt with by the Committee, at their discretion, for the general benefit of the Fund, unless instructions to the contrary are forwarded with the parcels. Gentlemen are invited to inquire of Professor Attfield, 17, Bloomsbury Square, London, W.C., as to whether or not copies of the books, etc. which they propose to give have already been contributed.]

Number of Volumes previously acknowledged, 94.

W. S. Stables, Scarborough.

Bowman's Medical Chemistry.
Kay-Shuttleworth's Modern Chemistry.

Professor Attfield, Bloomsbury Square, W.C.

A complete set of the Transactions of the British Pharmaceutical Conference.
The Year-Book of Pharmacy, 1870.
The Year-Book of Pharmacy, 1871.
Pharmacopœia of the United States, 1860.
The British Pharmacopœia, 1867.

John Nesbit, Portobello.

Balfour's Manual of Botany.

Roberts, Dale and Co., Manchester.

Specimens of Chemicals.

G. B. Clarke, Woburn.

Scapulæ Lexicon Græco-Latinum. 2 vols.
Morell, T., Lexicon Græco-Prosodiacum. Maltby.

A. Allchin, Barnsbury, N.

Kane's Elements of Chemistry.
Mitchell's Practical Assaying.
Smee's Electro-Metallurgy.
Mitscherlich's Chemistry.

W. A. Sanger, Oxford Street, W.

Brande's Chemistry. 3 vols.
Noad's Chemical Analysis.
British Pharmacopœia, 1864.
Faraday's Chemical Manipulation.
Spurgin's Materia Medica.
Buchan's Domestic Medicine.
Balfour's Botany.
Beeton's Chemistry.
Fownes' Chemistry.
Pharmacopœia, 1796.
Stockhardt's Experimental Chemistry.
Hooper's Medical Dictionary.
Bentley's Botany.
Withering's British Plants. 4 Vols.

R. O. Fitch, South Hackney, E.

Normandy's Chemical Analysis.
Hunt's Poetry of Science.

Peter Squire, Oxford Street, W.

Companion to the British Pharmacopœia. 3 copies.
Pharmacopœias of the London Hospitals. 3 copies.

Professors at the School of Pharmacy, Paris.

A box of Books.

William Fingland, Wavertree, Liverpool.

A set of five large Lithographic Plates of the Romano-British Tessellated Pavements of England.

Samuel Herbert, Bristol.

Lennie's English Grammar.
Pharmaceutical Latin Grammar.
Lescher's Guide to the Modified Examination.
Buckmaster's Chemistry.

T. Hambridge, Oxford.

Magazine of Natural History.

John Taylor, Torquay.

The Pharmaceutical Times. Vols. i. ii. and iii.
Morfit's Chemical Manipulation.
Fyfe's Elements of Chemistry.
Magazine of Science. Vols. i. to vi.

George Sant, Atherstone.

Wittstein's Chemistry, by Darby.
Barber's British and London Pharmacopœias Compared.
Barff's Introduction to Chemistry.

The Pharmaceutical Journal.

SATURDAY, DECEMBER 23, 1871.

Communications for this Journal, and books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

APPRENTICESHIP AND THE PRELIMINARY EXAMINATION.

FEW things are more difficult than to maintain the interest of a discussion in which the arguments all proceed from one side. Even that accomplished controversialist, Mrs. CAUDLE, who so well understood the art of relieving her matrimonial opponent from the cares of a reply by keeping her own tongue continually going in the frequent reiteration of what she had to say, was often mortified to find that the only result of such one-sided eloquence was, that Mr. CAUDLE—slept! There may be a danger of a similar effect upon our readers from a recurrence at so short an interval to the subject of Apprenticeship and the Preliminary examination. But our apology is to be found in the recently published Report of the Board of Examiners on the Preliminary examinations conducted by them during the past year, together with the additional testimony of an experienced teacher to the same effect in our columns this week, telling of such absolute ignorance in some of the candidates, and such lack of sound education in others, that one wonders how they came to waste their time and money in presenting themselves for examination.

The most serious aspect of the evil is that many of these incapables are already connected with the business by ties of apprenticeship. That a youth should have been bound to a calling, and have devoted more or less time to it, before finding himself unable to pass the first test of his fitness for entering it, is a pitiable occurrence, and one that promises ill for his success in satisfying the requirements of the law before he can practise it with profit or credit to himself. To such youths, however, the greatest goodwill has been shown by pharmaceutists throughout the country, and if they are as ready to help themselves as the different Associations appear to be willing to aid them, a few years' hard work will greatly improve their position.

What shall be done with regard to apprentices in the future? It is on the practical answer given to this question that the future status of pharmaceutists will depend. And here the interests of the public, the employer, and the candidate for apprenticeship are at one. That it should be possible for the dispensing of prescriptions to be entrusted to persons capable of giving such grotesque renderings of the Latin directions as those instanced in the Examiners' Report, is not a very comforting fact for the public, who are liable to be poisoned, or the employer who may be ruined in payment of damages. It may be supposed that the instances were exceptional; such, however, is probably not the case. We are ourselves in almost daily receipt of communications from this class of persons, which, from the evident utter inability of the writers to comprehend the rudiments of Latin, English, chemistry, or anything else, are perfectly bewildering and impossible to understand.

But what should be the answer to the question we have put? Respecting this, there is in theory perfect unanimity, namely, that no apprentice should be indentured before he has passed the Preliminary examination. This answer has now received the official endorsement of the Board of Examiners in presenting, and of the Council in receiving, the recommendation contained in the Report. Such being the case, we hope the practice will be in accord; and that, although there will doubtless be exceptions through an injudicious inability to say "No," or a too eager hankering after a premium, it will henceforth be the rule for pharmaceutists to ensure, as far as possible, good and intelligent service from their apprentices by requiring them to have passed this preliminary test with credit.

MINERAL SPRINGS IN JAPAN.

A FEW interesting particulars relative to some mineral springs in Japan are given by Mr. TROUP, in his account of a short tour made by him in that country, which has recently been issued as a Parliamentary paper. He says that the sulphur springs at Numajiri, in the province of Iwaskiro, present probably a phenomenon that could not be found in any other part of the world. The springs, which are approached by a somewhat difficult mountain road, are several in number, and combine to form what is literally a mountain stream of hot sulphur-water. The breadth of the stream may be stated as from two to three yards, though in running over a stony bed it spreads out in some places over a greater space. Immediately below the springs a rich deposit of yellow mud is formed; but in the main stream the deposit assumes more of a greenish tinge. Several miles below the springs, after the stream has mingled with other mountain streams, with which it runs into the lake of Inawashiro, the water still retains a very perceptible sulphurous smell and taste.

At Oshiwo, in the same province, there are two salt springs of tepid water. The manufacture of salt is there carried on by simply evaporating the spring water in pans placed over wood fires. The salt so obtained is much whiter than the ordinary Japanese salt, being nearly equal in colour to

English table salt. Only a small portion of the water, however, is so used, the bulk of it being allowed to run into a neighbouring stream.

At a recent meeting of the Agri-Horticultural Society of Madras, a reference was made to the medicinal properties of *Spilanthes oleracea*, especially as to its use as a remedy for toothache.

Colonel Pears, who communicated the fact, says that it was administered on the recommendation of a native servant to a friend of his who was suffering from very severe toothache, and that it effected a perfect cure in a very short time. Dr. Hunter pointed out that the *Spilanthes* contains some acid principle, and, when chewed, causes a copious flow of saliva. The use of such articles for the relief of toothache is of very ancient date in European medicine, the pellitory of Spain having long been used as a masticatory in cases of toothache. The *Spilanthes* is probably just as effectual as the pellitory, and is, moreover, easily obtained in India.

The plant, which belongs to the *Compositæ*, is an erect, branching annual, growing about 12 or 14 inches high, and having small yellow flower-heads at the ends of the branches. It is well known for the peculiarly pungent taste of its leaves, on which account it is frequently cultivated in some tropical countries for use as a salad and pot-herb. It is known as Pará grass; in Japan it is called Ho Ko So.

A correspondent of the *Leavenworth Journal of Pharmacy* reports the result of an examination of a specimen of opium, purchased from a wholesale house which boasts that the opium sold by them is selected by their agent at Smyrna. One pound and a half of the opium in question was found to contain four ounces of gravel mixed with a few particles of iron pyrites.

It is stated in a recent number of the *Birmingham Morning News* that injurious results have followed the use of a disinfectant supplied to the town of Wolverhampton by its authorities, and conjectured to contain carbolic acid. In one establishment where it was used, we are told that the sickness of three men is attributed to the disinfectant, as well as the death of two valuable dogs.

A series of coloured photographic illustrations of interesting cases occurring in the practice of the British Hospital for Diseases of the Skin is to be published by subscription, in furtherance of one of the objects for which the hospital was established, viz. "the diffusion of knowledge regarding the diseases of the skin." The work will be under the superintendence of Mr. Balmanno Squire, and will be issued in quarterly parts.

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

The Fifth General Meeting was held at the Royal Institution on the 7th inst.; the President, Mr. E. Davies, F.C.S., in the chair.

Mr. J. Simpson, 10, Rumford Place, was elected a member of the Association.

Donation of the current numbers of the Pharmaceutical Journal was announced.

The President read a circular he had received from Dr. Attfield, asking for aid in replacing the loss sustained from fire by the Chicago Pharmaceutical College. The President said he had been named one of the committee formed to promote this object, and he should be glad to receive contributions of money, books or objects for the Museum.

Mr. Samuels showed a new and simple contrivance to note hygrometrical changes in the atmosphere, called "the Chameleon Barometer."

Mr. Fraser then read a paper entitled "Notes on Practical Pharmacy," in which he mentioned his experience in testing for morphia in opium; and in speaking of the value of the B. P. test said, that although when worked carefully it would give true results, yet it was just possible that, with hurried work, a part of the morphia would be separated along with the colouring matter, thus giving the percentage too low. In any case the morphia is brownish from the presence of colouring matter. For the purpose of checking this test, he used the method known as Staples', in which the morphia is precipitated from an aqueous solution, to which alcohol has been added, by ammoniacal spirit; this gives almost colourless crystals. These two processes, carried on simultaneously, he considered to be sufficient for all practical purposes. Mr. Fraser next treated on the advisability of having a hard and fast standard for the quantity of morphia which shall exist in the official opium preparations. Lastly, he advocated the question, whether we ought to standardize other drugs according to the percentage of the alkaloid or active principle; and he expressed an opinion that these, from a medical point of view, will be more satisfactory remedial agents than either the system now in use or the substitution of alkaloids. In conclusion, the new process for preserving and seasoning wood by means of boiling in a solution of borax was briefly noticed.

A discussion followed, in which the President, Mr. Tanner, Dr. Symes and Mr. Fraser took part.

A vote of thanks to Mr. Fraser for his paper was then passed.

MANCHESTER CHEMISTS' ASSISTANTS' ASSOCIATION.

The Fifth Ordinary (fortnightly) Meeting of the session was held at Mitre Chambers, December 12th; the President (Mr. Lane) in the chair.

A paper was read by Mr. Gill, on "Starch."

After a short general introduction, the reader proceeded to treat—first, of starches used in the arts, viz. wheat, potato and rice, and describing their different methods of production; afterwards, those used as articles of diet, as arrowroot, tapioca, tous-les-mois, etc., with their sources and modes of preparation.

The various tests were given practically, and the different varieties of starch-granules shown under the microscope.

These illustrations were very instructive, and added considerably to the interest of those present. The next meeting is arranged for January 9th, 1872, when a paper will be read on "Cinchona Barks," by Mr. Ridley.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

At the Meeting of this Society, on Thursday, December 7th, Professor FRANKLAND, F.R.S., in the chair, Dr. J. H. Gladstone, F.R.S., read a paper on "Essential Oils," in continuation of one read before the Society eight years since. As we may have an opportunity of printing this paper in full on a future occasion, at present we only give a brief abstract. The first group of oils described included citrin, lign aloe, pimento, and oil of villvert. The hydrocarbons from essential oils were divided into three polymeric groups, having the formulæ $C_{10}H_{16}$, $C_{15}H_{24}$, and $C_{20}H_{32}$, and the line of demarcation observed in comparing their physical properties pointed out.

Many of the essential oils are mixtures of a hydrocarbon with a compound containing oxygen, of which but few have hitherto been carefully examined. Those obtained from citronella and from wormwood the author calls citronellole and absinthole respectively: they both have the composition $C_{10}H_{16}O$, the most remarkable point of difference between them being in their refraction equivalents; that of absinthole being 74·5, which agrees closely with the theoretical for $C_{10}H_{16}O$, while citronellole has 79·3 or 79·8 for its equivalent, a discrepancy almost the same as that found throughout the great phenyl group. Besides these he has examined cajeputole from oil of cajeput, and also the two carvoles from oil of caraway and oil of dill. These appear to be identical and not merely isomeric, and are remarkable for forming a crystalline compound with sulphuretted hydrogen having the composition $(C_{10}H_{14}O)_2H_2S$. The physical properties of menthole from spearmint, myristicole from nutmeg, and hydride of cumanyl from cassia, have likewise been examined; the latter has the enormous refraction of 1·6045 for the line A, and its refraction equivalent is also very abnormal.

In the discussion that followed, the PRESIDENT said that the paper which Dr. Gladstone had communicated to the Society was one of great importance, since these physical qualities were facts which would remain unalterable however much our views as to the theory of their constitution might change, and although no one admired this class of investigation more than he did, he might also be allowed to speak a word in favour of certain chemical reactions which might, perhaps, enable us to relegate these hydrocarbons to their proper families, such as the action of chlorine or bromine on them. He should like to elicit from the author if he had tried any such reaction, so as to distinguish, for example, whether they were hydrides or radicals.

Dr. GLADSTONE said that bromine and chlorine derivatives had been prepared, but that the result had been unsatisfactory.

Dr. WRIGHT asked whether his researches had led the author to consider the hydrocarbons as isomeric in the same way that the butylic hydrides are, or was it possible that many of these hydrocarbons might be identical, the difference in their properties being due to accidental impurities.

Dr. GLADSTONE replied that these oils were distinguished in some cases chiefly by their optical properties, and in others by their odour: citronellole was distinguished from absinthole by the former having a considerably higher refractive equivalent than the theoretical, like that found in compounds throughout the great phenyl group; and again, the carvol from dill and the carvol from caraway were considered to be identical and not isomeric, from having the same odour; the same might be said of the eugenic acid from pimento and from cloves; identity of odour alone, however, is not sufficient to establish the identity of the hydrocarbons.

Dr. WRIGHT suggested that the odour might be due to a chemical change which the substance undergoes in the presence of oxygen, and in contact with the mucous membrane of the nose. It was well known that hydrocarbons which had been recently distilled over sodium had a less powerful odour than they had after being exposed for some time to the air.

Professor A. H. CHURCH referred to the very interesting sulphur compound $(C_{10}H_{14}O)_2H_2S$, in which an oxidized oil was united with sulphuretted hydrogen. Some eight or nine years ago he had described tasmanite, a resin found in a shale from Tasmania, which contained oxygen and sulphur in the same relative proportions as the above-mentioned compound. This resin, when treated with sulphuric acid, evolved sulphuretted hydrogen, so that the sulphur was in organic union with it, and not like the sulphur found in coal. In another fossil resin, dysodile, which he had examined, the sulphur and oxygen only approximated to that ratio, but then it was not pure.

Dr. H. E. ARMSTRONG then read a paper entitled "Observations on Nitrochlorophenols."

SOCIETY OF ARTS.

DYES AND DYE-STUFFS OTHER THAN ANILINE.*

BY DR. CRACE-CALVERT, F.R.S.

LECTURE III.

Blue Colouring Substances.—Indigo, Orchil, Cudbear, Litmus, Prussian Blue and Ultramarine.

(*Continued from page* 496.)

The carmines of indigo are especially used by silk-dyers, in consequence of the removal of the green colouring matter above referred to, and which, if allowed to remain, would spoil the blue or purple which they wish to obtain. The method practically adopted to ascertain if the sample has been well washed, consists in rubbing a small quantity of it on a piece of glazed paper, which, when the colour dries, gives a colour varying from a pale blue to a rich copper purple, according to the mode of manufacture; and if any green colouring matter is left in, it shows itself as a green ring round the blue circle.

The following may be taken as the composition of a sample of carmine of indigo of fair quality:—

Water	85
Indigo	10·2
Saline residue	4·8
	100·0

The sulpho-indigotic acids are especially used by woollen-dyers, who add to the dye-beck a little alum and cream of tartar, which helps the fixing of the indigo on the wool. The green colouring matter is in this case not objectionable, having no affinity for the fibre of wool.

The carmines of indigo, as well as the sulpho-acids, are easily decolorized by reducing agents, such as hydrogen and sulphuretted hydrogen, but they gradually reassume their original colour when exposed to the atmosphere, through the absorption of oxygen.

The above compounds, not being suitable for dyeing cotton, and not giving colours on silk and wool that may be considered fast, I shall now proceed to describe a few of the methods followed to obtain fast indigo blues. They are all based on the principle of the reduction of blue indigo into white indigo. The latter compound is held in solution by an alkali, which enables the dyer or printer to introduce it into the fibre of the fabric, where, on exposure to the atmosphere, the alkali combines with carbonic acid, and the white indigo thus liberated absorbs

* Cantor Lecture, delivered Tuesday, Feb. 21. Reprinted from the *Journal of the Society of Arts.*

oxygen, and becomes insoluble blue indigo. The principal class of goods to which this chemical reaction is applied is to the vegetable fibres, linen and especially cotton. As far as dyeing is concerned, the processes can be classed under two heads, hot and cold. The hot process is principally applied to wool, the cold to vegetable fibres, especially cotton.

The oldest and still most generally employed method of preparing cold vats consists of putting into a vat containing about two thousand gallons of water, sixty pounds of indigo, very finely powdered, one hundred and eighty pounds of slaked lime, and one hundred and twenty pounds of sulphate of protoxide of iron or green vitriol (free from any trace of copper salt), the two latter substances being added from time to time. The greater part of the lime used unites with the sulphuric acid of the iron salt, to produce sulphate of lime or gypsum, and the liberated protoxide of iron removes the oxygen from the indigo, becoming converted into saline oxide, whilst the reduced indigo dissolves in the excess of lime employed.

Messrs. R. Schloesser and Co., of Manchester, have introduced within the last year or two a marked improvement in the preparation of cold vats, which removes the great objections of the bulky precipitate of sulphate of lime, the formation of an oxide of iron, and the loss of indigo by its combination with the oxide of iron referred to in the previous part of the lecture. The bath remaining much more fluid, the pieces are less apt to be spotted, and a better class of work is produced. To carry out their process, they add to the ordinary two thousand gallon vat twenty pounds of ground indigo, thirty pounds of iron borings, thirty pounds of their remarkable powdered zinc, and thirty-five pounds of quick lime; the whole is stirred up from time to time for twenty-four hours, when it is ready for use. If the bath is not considered sufficiently strong, a little more lime and zinc are introduced.

The chemical theory of the process is, that the zinc, under the influence of the lime, decomposes water, combining with its oxygen, and the hydrogen thus liberated removes oxygen from the indigo, which then dissolves in the lime.

To dye cotton yarn in the above vats, it is simply necessary to dip it for a few minutes in the dye-bath, and expose it to the atmosphere, when the green hue it has acquired passes rapidly into blue. This operation is repeated until the yarn has attained the required depth of shade, when it is passed into weak vitriol, washed, and is ready for market.

To dye calicos, the pieces are hooked on frames, passed through a bath of weak milk of lime, and then dipped into the reduced indigo vat. After fifteen minutes, the frame is taken out and the cloth exposed to the air for about the same length of time. It is again dipped, the process being repeated until the required depth of tint is attained. It is then passed through weak vitriol, and washed. The cold vats are especially used when it is wished to obtain white and yellow designs on a blue ground; but when the object in view is to produce a self-colour, a more rapid process is adopted. This consists in passing the pieces through a dye-beck, then through an acid liquor, and lastly in water, by means of rollers fixed in the vat. The bath is composed of lime, sulphate of iron and indigo, but is kept hot, instead of cold as in the former case.

There is still another process, which is now used to a limited extent only, but was at one time very extensively employed. It produces on the cloth a pale blue, which has a great similarity of tint to that seen on the china porcelain, from which it derives its name of china-blue. To produce it the pieces are printed with a mixture containing very finely-powdered indigo and a little acetate of iron, and are made to pass through six successive vats. The first two contain lime, the third sulphate of iron, the fourth a solution of caustic soda, the fifth a dilute solution of sulphuric acid, and the sixth water. When the design has acquired the required depth of blue, the pieces are washed, passed once more through weak sulphuric acid, and again washed. The chemical reactions are exactly similar to those in the cold vat process.

For dyeing wool, a modification of the old woad vat is employed. The use of woad being now almost entirely discontinued, I shall merely call your attention to the process in which indigo has been substituted for woad. It bears the name of Indian vat, doubtless from the process having been practised in India and imported from thence. It is as follows:—Eight pounds of powdered indigo is added to a bath containing $3\frac{1}{2}$ pounds of bran, $3\frac{1}{2}$ pounds of madder, and 12 pounds of potash, which is maintained for several hours at a temperature of 200° F. It is then allowed to cool to 100° F., when fermentation ensues. After about forty-eight hours, the indigo is rendered soluble, being reduced by the decomposition of the sugar and other products contained in the bran and the madder-root during the process of fermentation. The bath should have a greenish-yellow appearance, having a frothy scum of a blue coppery hue.

Of late years, improvements have been made in this class of vats, by which the expense of using madder is avoided. They are now prepared by adding to water, at a temperature of 200° F., twenty buckets of bran, twenty-six pounds of soda crystals, twelve pounds of indigo, and five pounds of slaked lime. After five hours, the bath is allowed to cool to 100° F., when fermentation ensues, and the indigo is dissolved in the alkali. The management of these vats requires great experience and care, for if the fermentation is too slow the indigo is not properly reduced, whilst if too active large quantities of indigo may be lost. The researches of Dr. Schunck, already referred to, not only show the method of avoiding this loss, but explain why it occurs. The remarks which I made as to the causes of failure in the manufacture of indigo are applicable here, namely, that if the fermentation becomes alcoholic and acetic, the non-oxidizable indigo compounds described by Dr. Schunck are generated.

I cannot leave the subject of indigo without bringing before you a most curious source of its production, namely, the human body. Medical men had observed from time to time that urine, secreted under certain pathological conditions, became brown, and sometimes even blue, when exposed to the atmosphere. The late Dr. Hassel discovered that in some instances the colouring matter was indigo, but here, again, we are indebted to Dr. Schunck for much information on the subject. In three papers presented to the Royal Society, he has proved that urine, in cases similar to those examined by Dr. Hassel, contained the glucoside of indigo, or indican. He also observed that indican was a very frequent constituent of urine secreted by persons in a healthy state, and, in fact, that it is produced generally when persons do not take sufficient exercise, and he has on several occasions succeeded in producing it by taking in his food a rather large excess of sugar.

Orchil, Cudbear, Litmus.—I shall now call your attention to a colour which was discovered in 1300, by an Italian named Federigo, who, during his travels in the East, observed the tinctorial powers of a certain class of weeds called *lichens*, and he introduced the colour into Florence under the name of *orchil.* By this discovery he and his family made a very large fortune.

Lichens are small plants which live either in the stems or leaves of trees, or on rocks, or damp soils. To this class belongs all the vegetation found in the Arctic circle, but the species growing there are not employed to produce the colouring matter orchil, the varieties used for this purpose being found in warmer, and especially in tropical climates. These latter can be divided into two classes; the first and most abundant, which grow on rocks near the seaside, includes the species *Roccella tinc-*

toria and *Rocella fuciformia.* They are obtained from the Canary Islands, Cape Verde and Sardinia, but principally from Madagascar, Zanzibar, Angola and South America. The second class grows inland, and includes the species *Variolaria orcina*, found especially in the Pyrenees.

Lichens do not contain any colouring matter already formed, but contain colourless acids, which, under the influence of ammonia and the oxygen of the atmosphere, give rise to the orchil. As the lichens imported into this country vary considerably in the amount of orchil which they yield, Dr. Stenhouse has rendered a great service to the manufacturers in furnishing a simple and accurate process of ascertaining their commercial value. The following is an outline of his method:—One hundred grains of the lichen are macerated with a dilute solution of caustic soda, two treatments being sufficient to extract the whole of the colouring matter. A solution of hypochlorite of sodium of known strength is added to the soda solution from a graduated alkalimeter; the moment the bleaching liquor comes in contact with the soda solution of the lichen a blood-red colour is produced, which disappears in a minute or two, and the liquid has only a deep yellow colour. A new quantity of bleaching liquid should then be poured into the soda solution, and the mixture carefully stirred. The operation should be repeated as long as the addition of the hypochlorite of sodium causes the production of the red colour, for this shows that the soda solution still contains unoxidized colouring principle. Towards the end of the process the bleaching solution should be added by only a few drops at a time, the mixture being carefully stirred between each addition. By noting how many measures of the bleaching liquor have been required to destroy the colouring matter in solution, the amount of colouring principle contained in the lichen may be determined.

The manufacturers of orchil are also indebted to Dr. Stenhouse for a process of obtaining the orchil, which, besides simplifying the operations required, gives brighter colours and extracts than could be produced before the publication of his method, in 1848. Of this you will easily judge when I tell you that the process carried on for centuries consisted in breaking up the weeds in water, to which putrid urine, lime and carbonate of soda were added from time to time. After two or three months' exposure to the air, the colourless principles of the lichen became transformed into the colouring matter orchil. As the science of chemistry progressed, and cheap means of producing ammonia were devised, this compound was substituted for the urine. Dr. Stenhouse's process consists in exhausting the lichens, by macerating them with milk of lime, squeezing the liquor off, and after having repeated this treatment two or three times, he adds an acid to the liquors, when a white gelatinous precipitate is produced, which, when collected and placed in contact with ammonia, gives rise to orchil.

You are doubtless aware that the beautiful purple and mauve colours obtained on silk and wool from orchil are extremely fugitive, losing their brilliancy on exposure to the light or to the influence of weak acids, such as sulphurous, which is so abundantly produced in our manufacturing districts. M. Marnas, of Lyons, succeeded in the year 1856, in making orchil colours which gave fast purples and mauves.

Before describing this valuable discovery, allow me to state that it had a most important bearing on the marked progress which the art of calico-printing has made since the date above mentioned. Until that time, neither dyers nor calico printers would use expensive dyes, but since then they have paid as much as £40 or £50 per pound for the solid dyestuff, although these enormous prices have been apparently decreased by the colours being sold in the state of paste or solution.

The demand for a fast purple in this country was so great, consequent on the introduction of the fast purples and mauves on the Continent by M. Marnas, that attention was directed to the preparation of these colours. Mr. Perkin had obtained from aniline a fine purple colour, as fast as the orchil colours, and M. Bechamp discovering about this time a method of producing aniline artificially from benzine, Mr. Perkin was enabled to manufacture his colour commercially. This may be considered as the first successful step towards the introduction of the spendid and varied coal-tar colours which are now so universally admired.

(*To be continued.*)

Parliamentary and Law Proceedings.

A Disputed Claim.

At the Shrewsbury County Court, held on Monday, December 4, before Judge Smith, Thomas Andrews, who alleged that he was a doctor of medicine, sued Frank Harry Davies for £4. 13*s*. 6*d*. Mr. Morris appeared for the plaintiff, and Mr. Chandler for the defendant. The case was a peculiar one, both from the nature of the claim and the defence set up to meet it, and was of considerable importance to the medical profession in the town.

Mr. Morris said the plaintiff in this case is Mr. Thos. Andrews, who was, until the 22nd of February, a chemist and druggist only, carrying on business in Theatre Buildings. Since that time he has, by medical examination and not by a purchased degree, either abroad, in London, in Edinburgh, or elsewhere, been certified as a doctor of medicine. This bill, for which the defendant is sued, was incurred before Mr. Andrews passed, and he is therefore only entitled to charge as a chemist and druggist.

Thomas Andrews, the plaintiff, was then called into the box. In answer to Mr. Morris, he said—I am the plaintiff in this case, and at the time this bill was incurred I was carrying on the business of a chemist and druggist. I have now passed as a doctor of medicine, but in the bill, which was prior to my doing so, I have only charged as a chemist and druggist for medicine supplied.

The bill was handed up to his Honour, and was as follows:—

"Shrewsbury, November, 1871.

"Mr. Frank Harry Davies

"To Thomas Andrews, M.D.

"To professional attendance, medicine, etc., £4. 13*s*. 6*d*."

Mr. Chandler: You hold a diploma; have you got it with you?

Mr. Andrews: I have not.

Mr. Chandler: Will you kindly tell me what kind of a diploma it is?

Mr. Andrews: It is a foreign diploma.

Mr. Morris: Your Honour, he is not charging upon the principle of having a diploma at all.

Mr. Chandler: But it is a matter of what he says in his bill-head. This says, "To Thomas Andrews, M.D. To professional attendance, medicine, etc. etc."

Mr. Morris: I object to this. We are only charging for medicines.

Mr. Chandler (to Mr. Andrews): I am asking you where you got your diploma from.

Mr. Morris: It does not matter where he gets his diploma from.

The Judge: The only question is, Mr. Morris, do you want the case adjourned to alter your bill of particulars?

Mr. Chandler: He charges us here as if the bill were from a medical man. I merely want to ask him where he obtained his diploma from.

In reply to this and several similar questions from Mr. Chandler, the witness would give no further description of the diploma than that it was an American one, and reiterated that he was not charging as a medical man. The bill-head had been made out by an assistant, since his examination.

The Judge suggested that the case should be adjourned, in order that the plaintiff might give particulars of his claim and amend his bill.

This course was strongly objected to by Mr. Chandler on behalf of the defendant. He said they wanted no better particulars; the inference was that the bill was a professional man's bill. Plaintiff came there as a medical man; if he were such, he would be on the register, and defendant would have no answer; if not, why was defendant brought there? He denied that he was instructed by any other person than the defendant, and objected to the proposed course, even if the expense was borne by the plaintiff.

The Judge, however, considered that the right course would be to give the plaintiff an opportunity of amending his particulars; and, in spite of a vigorous protest from Mr. Chandler, the case was adjourned for that purpose.

Poisonous Christmas Cakes.

On Friday night, December 15th, Professor Thorpe, of Anderson's University, Glasgow, while passing a pastry baker's shop near the centre of the city, observed in the window a Christmas cake garnished with a suspicious green-coloured substance. He purchased the cake, and, on analysis, discovered that the green tint was produced by arsenic. On the following day the Professor's assistant purchased two cakes similarly coloured. The police were informed of the circumstances, and on the shop in question being searched, another cake of the same description was found. The proprietor of the shop admitted that he had painted part of the sugar ornamentation with what is called "emerald green," which he purchased in a drysalter's shop in the city. He was taken into custody on Saturday night, pending inquiry.

Poisoning by Lucifer Matches.

On Friday, December 8, a very distressing event occurred at Dalton Green, near Huddersfield, namely, the poisoning of a child through eating lucifer matches. The child was between two and a half and three years old, the daughter of Mr. John Hutchinson, traveller. On Friday morning she went to play, and at noon, when having dinner, she began to vomit. As the food left her stomach the smell which is perceptible after a match has been struck was noticed. It was at once thought that the child must have been eating matches, and the mother proceeded upstairs, when she found that a large number of matches had been spilled on the floor, and it became evident the child had been playing with them. Between two and three o'clock the child was taken to Dr. Scott, York Place, Huddersfield, where an emetic was administered; and he recommended that she should be taken to the Infirmary to have the stomach pump applied. The child was taken home and grew worse. Its grandmother imagining that she was suffering from inflammation of the lungs, treated it for that complaint, but the treatment did it no good, and some time after tea Dr. Booth was sent for. Dr. Booth attended, but in the meantime the child had died.—*Leeds Mercury*.

The Poisoning Case at Hoxton.

On Monday, December 19, Mr. John Humphreys, the Middlesex coroner, resumed the investigation respecting the alleged murder of William Dent Russell, aged seven months, who was supposed to have been wilfully killed by poison.

The evidence of Mrs. Amelia Russell proved that the deceased was her son, and that she lived at 8, Rahere Street, Goswell Road. She was the wife of a cabinetmaker, named William Dent Russell. On Monday fortnight her son became ill, and her husband said that he hated to hear it cry. She, therefore, bought a cough mixture to prevent its crying. She got the mixture at Mr. Hodaile's, a chemist, in Cross Street, Shepherdess Walk. On Monday, Tuesday and Wednesday she gave the deceased some of it, and it did him good. On the following day, Thursday, she gave the child some of the mixture and he became ill, and she ran with him to her mother's. On the following Friday the child died. Her husband had been drunk on the Monday, but the following days he was sober. She could not tell how oil of vitriol got into the cough mixture. Only she and her husband had access to the locked coal cellar in which the oil of vitriol was kept. The cough mixture was kept in a cupboard in the sitting-room.

After some further evidence, the jury returned a verdict to the effect that the deceased was killed by the wilful mixing and administration of poison, but by whom the poison was mixed and administered there was no evidence to prove. The coroner said that was tantamount to an open verdict of wilful murder.

Suspected Poisoning by Antimony.

The inquest at Bilston, upon the body of a child whose death was suspected to have been caused by antimony, which has been twice adjourned to allow of the exhumation and examination of two other children, was resumed on Tuesday, Dec. 19. Dr. Hill deposed that he had detected the presence of antimony in the body of the third child, William Griffiths. This child died on the 10th of October, and the death was registered on the 13th of that month, the medical certificate attributing the death to "asthenia" and "gastric fever," six days. The surgeon deposed that he did not believe the mother carried out his instructions in respect of the diet ordered, and that his medicine had nothing like antimony in it.

The coroner having reviewed the evidence that had been given, the jury deliberated about half an hour and returned a verdict of "Wilful Murder" against the accused in respect of all the three children, and she was committed for trial at the next Staffordshire Assizes.

Infringement of the Pharmacy Act.

The following case was heard before the Wrexham County Bench on Monday, Dec. 18th:—George Gibbons, of Adwy'r Clawdd, was summoned for having, on the 29th of November, unlawfully sold by retail two bottles containing poisons, laudanum and syrup of poppies, without either of the bottles being distinctly labelled with the name of the article and the name and address of the seller.

Mr. Acton, instructed by Mr. J. F. Edisbury, Local Secretary to the Pharmaceutical Society, appeared to prosecute, and Mr. J. A. Hughes appeared for the defendant. Mr. Hughes said his client admitted the offence.

Mr. Acton said the information was laid under the 17th section of the Pharmacy Act. The Bench would be aware that there was an Act passed for the regulation of the sale of poisons, by which persons not registered were only to sell according to certain precautions. It was a matter of considerable consequence, and he might be permitted to say that there was a machinery provided for that Act by the Pharmaceutical Society of Great Britain so that it may not become a dead letter. The offence was selling poisons without labelling them with the name and address of the seller, although the bottles were labelled "Poison," which it was important should be done, so that if anything went wrong they might know who was the seller.

In reply to Mr. Meredith, it was stated that this was the first offence of the nature in which proceedings had been taken in this district.

Mr. Hughes said his client bore a good character. For six or seven years he had been dispenser in the surgery of Dr. Williams, of Wrexham; and, subsequently, he was employed as an assistant to Dr. Davies. He regretted extremely to have to appear before the Bench. The offence charged was not of a very serious nature, the only offence being not having his name printed on the label; and he hoped the magistrates would mitigate the maximum penalty, which was £5.

Fined 40*s.* and costs, Mr. Meredith advising the defendant to be very careful in future.

Robbery by a Chemist's Assistant.

At the Newcastle Police Court, December 4th, James Marlee, 19 years of age, was charged with stealing £25, belonging to his master, Mr. Boe, chemist, Hinde Street, Scotswood Road; whilst a woman named Isabella Pearson, aged 30 years, was charged with receiving the money, knowing it to have been stolen. It appeared that on Monday the prosecutor sent Marlee with £25 and the bank book to Messrs. Hodgkin, Barnett, Pease and Co.'s bank to deposit the money, but he never returned to the shop. Information was given to the police, and on inquiries being made it was found that he was cohabiting with the female prisoner, who is a married woman, but living apart from her husband. It was also ascertained that they had taken part in furnishing a house in Wellington Street. Detective-officer Fawcett traced them to this house, and found them there, about half-past twelve o'clock at night. Marlee was concealed in an inner room, with the door fast on the inside, when the officer entered the house, but shortly afterwards he was apprehended and sent to the police-station. Fawcett searched the house, but could not find the bank book or the money, and the woman denied having any knowledge of the robbery. About two o'clock in the morning, Fawcett, accompanied by Superintendent Dixon, returned to the house and a second search was made, during which Pearson pointed to the bank book, which was lying in the place that had been searched before. In a water closet they found a purse containing £2. 13*s*. The officers then took the woman into custody. It was proved that the money in question had not been deposited in the bank, and the magistrates then remanded the prisoners for a week.

On December 12th, the prisoners were brought up on remand, when prosecutor informed the court that he had received £10 from the lad's father, and he did not wish the matter to be carried further. The magistrates reminded Mr. Boe that the compounding of a felony constituted an offence against the law, and that the case must proceed. Marlee was then committed for two months, with hard labour, and the woman, who has been cohabiting with the other prisoner, was discharged.—*Newcastle Daily Chronicle.*

Review.

Useful Chemical Tables, arranged for the use of Teachers and Students. By Adolphus Collenette, Professor of Chemistry, Elizabeth College, Guernsey. (F. Clarke, publisher. Price 6*d.*)

Cynics say that laziness, and not necessity, is the mother of invention, but it is unfair so to designate the sincere endeavours of an intelligent mind to smooth and make straight the paths of science. Mr. Collenette, in compiling these tables, has certainly taken a step in the right direction. They will become more useful to pharmacists than the author is aware of, he, apparently, only recommending them to teachers. How many pharmacists there are, men of this generation, who may have passed with honours five or six years ago, and are yet quite at sea with the new notation! It is here so simplified that the veriest tyro in chemistry may see the whole thing at a glance. The oxides, sulphides and chlorides of the sixty-three elements are all tabulated and the number and manner of their respective unions visible at once. To damn with faint praise is perhaps as bad as unqualified laudation, so before the compiler proceeds further (and we hope he may), his attention must be called to one or two points.

What necessity exists for establishing such a marked difference between metals and metalloids? a word generally objected to by physicists of the day, and not without reason, its meaning being contrary to its application. Even should, however, the compiler view H, etc. as the gaseous state of hydrogenium, etc., the objection grows stronger; the so-called metalloids becoming metals. The incorrect succession of the molecular arrangement of the combining elements would be likely to mislead a student, had not the author given his reasons for deviating from that course, which are, perhaps, advantageous from a professorial point of view, but seem odd from a purely scientific stand-point. A few apparent discrepancies are accounted for by the author, by having followed Dr. Frankland's plan, "whose hypothesis of absolute, latent and active atomicity gives a clear and reasonable explanation of the poly-atomicity of some elements."

The tables will prove of immense value to practical chemists, giving at a glance the various combinations of the elements with O, Cl and S. The blank forms attached can easily be filled-in for iodides, bromides, hydrates, acids, etc.; and it is to be hoped that the compiler will enlarge upon the idea, and give us a few more of these "useful tables."

Obituary.

BERTHOLD SEEMANN, Ph.D., M.A., V.P.A.S.L., F.L.S., F.R.G.S., etc.

It is our sad duty to chronicle the death of Dr. Seemann, the well-known botanist and traveller. He was born at Hanover, February 28th, 1825, and was educated at the Lyceum of his native town; Dr. Grotefend, a celebrated scholar, being at that time head master.

Dr. Seemann published his first article when only seventeen years of age; but his botanical career may be said to have commenced from 1846, when he was appointed naturalist to H.M.S. Herald, then on a surveying expedition in the Pacific. He left England in August, 1846; but on his arrival at Panama the 'Herald' and 'Pandora' had not returned from Vancouver's Island, and he profited by the delay to explore the greater part of the Isthmus. His observations were extended to every branch of science. On the return of the 'Herald' to Panama he joined, and remained with her until the completion of her voyage.

He also took the opportunity of making himself acquainted with the Pacific coast of South and Central America by frequent journeys inland, traversing Peru and Ecuador, and crossing the Cordillera of the Andes to Loja, one of the Cinchona regions. In his journey through part of Mexico he narrowly escaped with his life from the Comanche and Alpache Indians. In 1848, the 'Herald,' in company with other vessels, made three attempts to reach the Arctic regions to search for Sir John Franklin. In 1850 the 'Herald' began her homeward voyage, staying for some time at Hongkong, Singapore, etc., and reached England in 1851. The narrative of this voyage Dr. Seemann, at the request of the Admiralty, published in 2 vols. 8vo, under the title of

'Narrative of the Voyage of H.M.S. Herald, being a Circumnavigation of the Globe and Three Cruises to the Arctic Regions in Search of Sir John Franklin.' The animals collected during the voyage were described by the late Sir John Richardson, and the plants by Dr. Seemann himself. So highly was this work of Dr. Seemann's esteemed on the Continent, that the Imperial German Academy of Naturalists elected him a member and subsequently President-Adjunct for life.

In 1859 the sovereignty of Viti or Fiji Islands was formally offered to Great Britain, but before accepting it the Government commissioned Colonel Smythe and Dr. Seemann to examine and report on the islands. During a stay of eight months Dr. Seemann thoroughly examined the group, and published the results under the title of 'Viti; an Account of a Government Mission to the Vitian or Fijian Islands.' He also collected materials for the 'Flora Vitiensis,' a quarto work illustrated with plates, which he published at his own cost and risk. This work, the last sheets of which are now in the press, comprises not only the results of his own explorations, but also of all his predecessors, and contains valuable notes on the medical and economic uses of the plants. On this work and the 'Botany of H.M.S. Herald' Dr. Seemann's fame will rest.

In 1853, Dr. Seemann started the largest botanical journal ever attempted, under the title of 'Bonplandia,' taken from his academic name, to which the leading botanists of the world contributed. At the completion of the tenth volume, in consequence of Sir W. Hooker discontinuing the 'Kew Journal of Botany,' Dr. Seemann brought out his 'Bonplandia' in a new form, under the title of the 'Journal of Botany, British and Foreign,' which is still in existence. Besides numerous articles from his pen, literary, scientific and political, Dr. Seemann wrote 'A Popular History of Palms,' which is undoubtedly the best handbook we have on the subject.

From 1864 to his death Dr. Seemann's great practical experience and knowledge have been employed in examining and reporting on the resources and capabilities of portions of Nicaragua. A few months ago he left England to return to Nicaragua for a short time, as the managing director of a mining company; but on the 10th of October, shortly after his arrival at the Javali Mine, he died of a fever caught at Colon.

Dr. Seemann was a writer of some power in several languages. He always took a great interest in the Pharmaceutical Society. Some of his earlier articles on medical and economic plants will be found in the eleventh and twelfth volumes of the first series of this Journal. He never lost an opportunity of identifying a plant with its product, or clearing up any doubts, and throughout all his publications will be found valuable notes on this subject. He paid great attention to the Sarsaparillas, and up to his last journey was endeavouring to trace the origin of some of them. To botanical students he was ever ready to lend a helping hand, and many will deplore his death as that of a personal friend. In him science has lost a good botanist and an experienced and successful traveller.

MEETINGS FOR THE ENSUING WEEK.

THURSDAY, Dec. 28. ......*Royal Institution*, at 3 P.M.—"Ice, Air, Vapour and Water." By Professor Tyndall. (First Juvenile Lecture.)

London Institution, at 4 P.M.—"The Philosophy of Magic." (Second Holiday Lecture.)

SATURDAY, Dec. 30. ......*Royal Institution*, at 3 P.M.—Professor Tyndall's Second Juvenile Lecture.

BOOK RECEIVED.

MEMORANDA ON POISONS. By the late THOMAS HAWKES TANNER, M.D., F.L.S. Third edition. London: H. Renshaw. 1872.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

AN APPEAL FOR HELP.

Sir,—As the issue of your Journal for the 23rd of December will probably receive more of the attention of our members than usual, owing to the occurrence of Christmas, may I crave space for a piteous appeal which comes from a distressed widow of one of our body, whose case is so exceptionally hard, that neither can she be relieved from the funds of the Society nor yet from the Benevolent Fund,—her husband never having been a member of the Society, and having died before the registry of chemists and druggists was an accomplished fact? The facts are as follow:—

T. P., a chemist and druggist, was incapable, through lingering illness, of effecting registration under the provisions of the Pharmacy Act, which it will be remembered passed on the 31st July, 1868, and came into force immediately. In October of the same year, or less than three months, T. P., who never rallied, died, and his widow, being ineligible for registration, was compelled to dispose of the business at an enormous sacrifice, and deprive herself of her only means of support.

It will thus be seen the poor widow's distress arises from, and as a consequence of, the Pharmacy Act passing into law at the moment her husband lay dying, precluding her from continuing the business as she might otherwise have done, leaving her, without any fault of her own, adrift, with an invalid brother dependent upon her, without income or settled home, but with a shattered constitution and broken health.

The facts as narrated above can be avouched by myself and are well known to our Secretary, Mr. Bremridge. I would urge the case on the consideration of our brethren, in the hope that the knowledge of it will add greatly to the pleasurable enjoyment of the festive season approaching, by the satisfaction of knowing that many have contributed of their abundance to the relief of the pinching necessities of the widow of a deceased *confrère*, upon whom has fallen heavily the consequence of a reform, by which their social status has been greatly enhanced.

Mr. Bremridge has kindly consented to take charge of any donations; and, trusting that this appeal will be liberally responded to, as it deserves, I commend it to the sympathies of all.

H. SUGDEN EVANS.

THE ESTIMATION OF MORPHIA IN OPIUM.

Sir,—In the discussion upon my paper, on "The Estimation of Morphia in Opium," several gentlemen made remarks to which I wish briefly to reply.

Mr. Williams thought the solution of iodic acid should be more accurately standardized. There is, however, no necessity for this. A process for preparing the solution was given simply because the acid is not a common one, and might not happen to be at hand. Professor Redwood said that, although the iodine was removed from contact with the organic matter in half a minute, "still there was a race between two reactions," etc. This theoretical objection is, I imagine, more formidable in appearance than reality. There are, I should say, good grounds for believing that, under the conditions laid down, the secondary action is nipped in the bud, and that the results obtained are close approximations to the truth.

Professor Redwood informed the meeting that he "had made a great number of determinations of the quantity of morphia in opium by the several known processes," and "had arrived at the conclusion that the process given in the Pharmacopœia was the best." But this statement, though important, leaves untouched the question of the degree of accuracy of that process. My own trials of it have certainly not given me a favourable idea of its accuracy; indeed, the effect of washing the precipitates with chloroform was sufficient to dispel such a notion. Then, again, the comparison, under like conditions, of the reducing power of the washed precipitate and of pure morphia proved beyond doubt that the precipitate contained some substance besides morphia; and the only question open to dispute is whether the process fairly indicated its amount.

[The reduction process furnishes a ready means for assaying precipitates of morphia obtained by the usual methods. These precipitates should always be washed with chloroform, and their solutions shaken with carbon disulphide before being submitted to the test.]

Mr. Groves said "he should be surprised if such a complicated process could be got through in two hours and a half." I can assure him, however, that the work is quite easy of execution, and may be completed (not, of course, including the drying) in the time mentioned.

It appears Dr. Tilden would question the accuracy of any volumetric process for morphia until the reactions of the "twenty-five different alkaloids described as having been derived from opium" have been ascertained. From this point of view the prospect is dismal enough, and the case for the present, at all events, quite hopeless.

After all, let me repeat that I do not put forward my method as being accurate in the strict scientific sense, but as affording "nearer approximations to the truth" than are obtainable by the inexact processes in common use. This notion may be erroneous, but if so the proof will consist, not of opinions, but of facts.

Sheffield, December, 1871. JOHN T. MILLER.

Professor Tyndall's Theory of the Blue Colour of the Sky.

Sir,—Utterly unwarranted by any connection whatever, except from the fact of being a subscriber to your valuable periodical, I take the liberty of addressing you on a subject which has for me peculiar attractions.

In the eleventh Conversazione of the Liverpool Chemical Association, held February 3rd (PHARM. JOURN., February 18th, 1871, p. 671), Mr. Albert H. Samuel states, "The long red waves have also a much greater amplitude or depth than the short blue waves, and are thereby enabled to roll over or pass by small obstacles which would interrupt and throw back the short and shallow blue waves," . . . and "the long deep red waves roll over or pass by these small particles, but the short shallow blue waves are stopped by them and thrown back or scattered into space, to which they communicate the blue appearance which we call sky."

1. I desire to ask if, on spectral analysis, any sunbeam has yet been found without the blue ray?

2. If the blue rays or waves are stopped and the red ones come on to the retina, how is it that a red wave produces a blue impression?

3. If the blue is always present in all solar rays, what reason is there for saying that it is stopped in ethereal space?

4. I have always read that on the highest mountains and in balloons the sky has an inky hue. Has any one ever analysed sunbeams at such altitudes, and, if so, is the blue there more intense than at the ocean level?

5. Upon what basis rests the supposition that our atmosphere is "filled with countless millions of excessively minute particles"? Has Professor Tyndall ever had opportunity to experiment with the air of the highest altitudes accessible to man?

I can understand Professor Tyndall's theory of the sea in regard to its colour, but it appears to me that this is inapplicable to the explanation of the blue colour of the sky; for in the case of the sea we are above it, and of all the rays the blue is the last to be absorbed, and, for that reason, the sea is blue; but in the case of the air or sky we are inside, looking up through the sea of ether. Professor Tyndall says, "That when a beam of light entered the sea, the heat-rays were absorbed by the surface, the red rays by a very superficial layer of water, the green rays next, and ultimately the blue;" because of this, the air, to the eyes of a fish, would have various colours, according to the depth, and finally it would be blue, because this is the ultimate ray which advances beyond its associates—the rest were stopped. Apply this theoretical explanation to the air or sky, it should be red. And, finally, how is it that the short vibrations of the blue waves have so much more locomotive power in water than in air? To me this appears a bad rule that will not work both ways.

"On bringing the powerful light of a magnesium light to bear upon the particles, the water assumes the characteristic appearance of the sky" (*vide id.*). This appears to sustain the theory of the colour of the sea, and disprove that of the air or sky. On the supposition that the bottle was between the light and the retina, the blue ray reached it because the others could not get through the bottle—were stopped. According to the ethereal theory, the blue stopped in the bottle and the other rays went on; therefore, with the light in this position, the colour of the bottle would be a compound of the prismatic colours minus the blue. The sky is, with regard to our retina, in the same position as the contents of the bottle, *ergo*, the sky ought to be of the same colour.

How is it that this ethereal theory can be applied to what Thomson says?—

> "'Tis distance that lends enchantment to the view,
> And robes the distant mountain in its azure hue."

If you should have time to give me a word in your Journal, I will be much obliged. I am in this benighted land without light, except as it comes through the magnesium light of your periodical and others which I receive. I am so deep in the sea of ignorance here, that everything is blue to me, except when your red light comes from across the sea.

Trusting that you will make due allowance for this letter, I remain,

GEORGE S. BARNSLEY, M.D.

Barra Mansa, Province of Rio de Janeiro, Brazil, S. A., 8th September, 1871.

The Substitution of Proportional for Specified Weights and Measures.

Sir,—Whilst reading the very able paper by Dr. Redwood in the last Journal, it struck me that all the difficulty which the writer appeared to encounter, would be easily removed by the adoption of a new unit of weight (the decem of 10 grains), and another unit of measure (the septigallon, of 10,000 grains), and strike out all other denominations of weights or measures, so far as the Pharmacopœia is concerned. The advantages that I see in this are that we still keep the grain weight, which I hold it is not advisable to do away with at present, and we get a system of weights and measures strictly decimal, and the numbers can be read as proportional parts, or as grams in the metrical system, or by the system of decems in English grains. The terms are all quite convertible, and equivalent one to another. I think every formula could easily be expressed in decimal proportions, with only slight alterations, on this principle, and it would be a virtual adoption of the metrical system. My engagements will not permit me going into the subject at any length, but I have thought it worth while to point this out for the consideration of those who are interested in the subject.

Bradford, Dec. 12th, 1871. F. M. RIMMINGTON.

Shall the Pharmaceutical Society Cease to be an Educating Body?

Sir,—I perceive from Mr. Hustwick's letter that my meaning in an important portion of my communication of Nov. 18th is capable of being misunderstood. I think if that gentleman will do me the favour to read the passage once more, he will see he has somewhat misrepresented me. The fault, however, is doubtless my own. I ought to have made my meaning so clear as to be incapable of misapprehension, and I hasten to supply the defect.

My scheme pretends to suggest no change whatever in that portion of the Society's duties which concerns the Pass Examinations. It is only its educational processes that I presume to discuss; and the Annual Simultaneous Examination, with its attendant rewards, is suggested simply as a just and equitable method by which the Society could aid all systematic efforts, whether provincial or metropolitan, in the cause of scientific pharmaceutical education.

Clifton, December 16th, 1871. G. F. SCHACHT.

Difficulties in Dispensing.

Sir,—I again trouble you with a few lines, since the remarks of Mr. Wilkinson in the Journal of to-day seem to give me a sufficient reason for doing so.

In his first paragraph, Mr. W. alludes to a remark of mine in the Journal of the 25th, upon the bad tendency of part of his otherwise admirable paper read at Manchester a few weeks ago. Not having used the words without some thought, I state the reasons I had for my belief. They are these two. Firstly, Mr. W. did not throughout the whole course of his paper assert the principle that in all cases, when possible, the prescriber should be communicated with before any material liberty be taken with his prescription. Since then that gentleman has owned to agreement of opinion with me in this respect. Secondly, Mr. W., because unable himself to make a passable-looking pill, using the full quantity of ol. cinnam., quietly omits the half of the last-named ingredient, and asserts his method to be the only way of forming a decent pill.

Now, if a man of Mr. Wilkinson's attainments and experience meets with difficulties occasionally, can he not see that apprentices and assistants will often have pills to make which, while presenting no difficulties to him, may be fraught with great obstacles to them, when of course they may conclude they have an equal right with Mr. W. to omit ingredients difficult of manipulation? I would close this part of the subject by reminding your readers that J. B. has given us a method by which the whole quantity of ol. cinnam. may be contained by the iron and gentian pills without the addition or subtraction of any active ingredient.

In the next part of the letter alluded to it is asked, Are not the extracts likely to be damaged by drying them? Perhaps so; but then Mr. W. must remember that he himself recommends this course in regard to ext. rhei in his own paper.

In reply to the next paragraph, which asks what real difference there is in the omission of half a quantity of essential oil ordered and the wasting of the same quantity upon the slab, I answer, but little; but would still recommend that we endeavour so to prepare the pills that they shall contain the whole.

And now, in regard to the more personal part of the epistle, I must first ask the writer to very carefully note that my presumption concerning the Manchester chemists was contingent upon the fact that in the Journal no report of the expression of any opposite opinion about the propriety of thus dealing with prescriptions was given, although part of the debate was reported; but as such objections were made at the Manchester meeting against the lecturer's views, he will see that I have not in reality the smallest charge to bring against the Manchester chemists as a body.

Finally, I am sorry to have to confess that I fail to see the applicability of the fable to which my friend so nicely alludes. Allowing, for the sake of argument, that my supposed attack upon the Manchester chemists is similar to that of the baser quadrupeds upon the lion, yet I can hardly see that this great body of talented and intelligent men are to be compared with the aged, dying forest king, incapable of self-defence.

To conclude, I cordially sympathize with Mr. Wilkinson, the more especially as I find that when he prepared the paper he had no thought of seeing it in print; and I know that it is far easier to find fault with a paper written by another than to read half so good an one myself.

WALTER B. CLARK.

Leicester, Dec. 16th, 1871.

Sir,—In reply to Mr. Wilkinson, I beg to say I do not possibly see that any injury can result to the extract (as he intimates), provided the suggestion in my former letter is closely adhered to, it being, strictly speaking, nothing more than what is directed in the Pharmacopœia. I can understand that if the heat applied be so great as to burn the extract, its active properties would no doubt be impaired.

I am sorry at having mistaken Mr. W.'s question in reference to the second prescription given in his letter of the 20th ult., but the correspondence had hitherto been on the manipulation, not directions, therefore I naturally concluded that when Mr. W. asked the question he referred to the manipulation, as he did not specially state otherwise.

Every one is well aware that occasionally cases do occur in which the dispenser is bound to exercise a little common sense, still I would not uphold the principle of making material alterations without first communicating with the prescriber, unless I was sure he had committed some palpable error, and could not be easily consulted.

Hackney, Dec. 18th, 1871. F. W. S.

Sir,—Mr. Wilkinson appears to have written his reply to the numerous criticisms his paper called forth whilst smarting under their aspersions, but with these I have nothing to do.

I merely suggested a plan by which the prescription he quoted could be formed into good and firm pills containing the whole of the oil of cinnamon ordered. As my using the tragacanth and magnesia was the result of several trials, I most certainly do not understand Mr. Wilkinson terming it a "pet scheme."

It is very necessary to be able to dispense pills containing an excessive quantity of essential oil, and as the subject is decidedly worth ventilating, I should like to have other opinions or further suggestions from those who have them to offer. Omitting part of the oil or squeezing it out afterwards are neither of them desirable processes.

The pills I made at time of writing to you before still keep their shape, and are in good condition.

17, *Bull Street, Birmingham,* JAMES SPENCER.
December 19th, 1871.

Shall the Pharmaceutical Society cease to be an Educating Body?—We have received a lengthy communication from a member of the Society, in reference to Mr. Schacht's paper on the educational question. The chief point of our correspondent's letter refers to what he regards as a change in the constitution of the Society which has found eloquent supporters, namely, the proposal to conduct all the Examinations by written questions,—these to be forwarded to the provinces, and answered in accordance with known stringent regulations. Our correspondent thinks that the Preliminary is the only one where this course is available. He objects that the dispensing department of the examination cannot be trailed round to various provincial centres, and that materia medica, deprived of its illustrative specimens, or botany minus living plants, would be a farce; while book chemistry alone is not worth a straw. Such a mode of procedure, in our correspondent's opinion, would merely result in producing patent paper pharmacists, and he says that he, being engaged in London business and having a wife and family to support, could not afford to engage such an one for his assistant.

P. Sparrow.—We are unable to furnish the recipe asked for.

S. T.—We would recommend you to address the question to Professor Crace-Calvert.

"*Puzzled.*"—The most simple way would be to try the experiments.

"*A Student.*"—As your difficulty appears to arise from what you deem to be an error or an obscurity in the book referred to, the best way would be to communicate with the author; but before doing so, it would be well to attempt yourself to solve the query. Probably a little more care would enable you to do this, for you have forwarded to us an equation in which carbonate of zinc does not occur.

W. J. Smith.—The statement is quite correct; it is "precipitated black."

A. B. C.—We presume that a calendar month would be meant, the engagement being a yearly one.

W. Bates.—Yes.

J. Bradshaw.—If the quinine is dissolved in the tinct. ferri perchlor., the water added, and, lastly, the syrup, the mixture will present an uniform appearance. The tincture should be that of the B. P.

"*Oxygen.*"—(1.) Of the two books mentioned, Royle's 'Materia Medica' would best answer your purpose. There is also a new edition of 'Pereira' announced. (2.) Roscoe's 'Chemistry.'

C. Gerring.—In most works on chemistry or materia medica.

A. M'Lean.—Your paper has been received and is under consideration.

W. M. B.—Yes; but the proprietor is responsible.

"*A Country Chemist.*"—Inquiry has been made, and the answer shall be published when received.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. Knowles, Mr. B. M. Johnson, Mr. G. F. Schacht, Mr. J. Ince, Mr. T. Bradley, Mr. W. B. Clarke, Mr. F. J. Hayes, Mr. Spencer, Mr. Sandy, Mr. R. G. Mumbray, Mr. J. Knowles, M. P. S., X. Y. Z., "Student of the Pharmaceutical Society."

THE APPLICATION OF MOLECULAR ROTATION TO THE DETERMINATION OF THE VALUE OF CINCHONA BARKS.

BY DR. J. E. DE VRIJ.

Since the publication of my first paper on this subject in the PHARMACEUTICAL JOURNAL of July 1st, the German Chemical Society at Berlin received on the 19th of the *same* month a paper from Mr. O. Hesse* (of Stuttgardt), containing a condemnatory criticism of my paper. Since the labours of this chemist in the field of quinology are highly esteemed by me, I am happy that my paper so soon attracted his attention, though I regret that he could not spare some more time to apply my process practically to some of the many barks which come into his hands. If he had done so, I am sure that his criticism would have been less condemnatory, and that he would probably have agreed with me that my process, notwithstanding all the imperfections which I have myself indicated in my paper, is a very valuable auxiliary in the investigation of cinchona barks. But, however this may be, I have since continued my investigations in the same direction, and have thus been led to amend my process.

In my former paper I recommended two observations to be made:—

1. The molecular rotation of all the alkaloids.
2. The molecular rotation of the part insoluble in ether.

I have since found it necessary to add a third observation, viz. to determine the molecular rotation of the part soluble in ether. The publication of my experiments in this direction will prove that of all the three observations, the last is the most interesting for the manufacturer of quinine:—

C. Calisaya hybrida from Java (*C. Hassk.*, Miq.)†

Mixed alkaloids . . .	[α]j = 50°·2 ↶.
Part insoluble in ether .	[α]j = 102°·7 ↷.
Part soluble in ether . .	[α]j = 97° ↶.

C. officinalis from Ceylon.‡

Mixed alkaloids . . .	[α]j = 145° ↶.
Part soluble in ether . .	[α]j = 162° ↶.

Rough mixed alkaloids from *C. succirubra.*

Darjeeling, prepared by Dr. B. Simpson. Received by me 24th August, 1871.

Mixed alkaloids . . .	[α]j = 24° ↷.
Part soluble in ether . .	[α]j = 81°·17 ↶.

The mixed alkaloids proved to contain all the five alkaloids.

C. succirubra from Ootacamund.

Bark sold in London, August, 1867.

Mixed alkaloids . . .	[α]j = 12°·8 ↶.
Part insoluble in ether .	[α]j = 29°·3 ↷.
Part soluble in ether . .	[α]j = 51°·4 ↶.

The mixed alkaloids proved to contain four alkaloids and no quinidine.

C. Calisaya from Java.

Bark from a stem preserved in the Colonial Museum at Haarlem.

Total amount of alkaloids 3·7 per cent.	[α]j=115° ↷.
Part soluble in ether	[α]j=113° ↷.

The alkaloids consisted of quinidine, cinchonine, cinchonidine and amorphous alkaloids, whilst not a trace of quinine could be found.

I will not occupy the space of this Journal by discussing these results, but will only quote one fact to prove their importance.

In April, 1870, the first Java bark was sold at Amsterdam. According to the official report to the Government from one of our eminent professors of chemistry, the Java *Calisaya* bark proved to be of first-rate quality, and not inferior to the American *Calisaya.** This judgment was founded upon the fact, that he obtained from that bark 3·5 per cent. of alkaloid soluble in ether, which he considered to be quinine. My investigation, however, of this bark proved that the part of the alkaloids soluble in ether turned the plane of polarization strongly to the right, whilst analysis proved that this bark contained only a trace of quinine, but a large amount of amorphous alkaloid soluble in ether.

In my former paper, I stated that the deviation produced by quinine is different, according as it is observed in solution in alcohol or in diluted acid; and that I thought it very probable that this difference would exist in the same direction with the other alkaloids. This supposition has been confirmed since, by the observations made by me with the valuable co-operation of the distinguished Professor of Chemistry to the Polytechnic School at Delft, Dr. A. C. Oudemans. We are still occupied in determining the molecular rotation of all the cinchona alkaloids both in alcoholic and acid solutions, the results of which observations I intend to publish in this periodical as soon as they are completed.

* Berichte der deutschen chemischen Gesellschaft zu Berlin. Vierter Jahrgang, no. 13 (August 7, 1871), s. 692.

† PHARM. JOURN., July, 1871, p. 3. ‡ *Ibid.* p. 2.

* Colonial Report for 1870, delivered by the Dutch Government to the Dutch Parliament.

VESICATING INSECTS.

BY M. C. COOKE, M.A.

(*Continued from page* 504.)

MARGINED BLISTER-FLY, *Lytta marginata*, Latr.; black, with the margins of the elytra ash-coloured.—Oliv. Ent. t. 1. f. 2; Durand, Journ. Phil. Col. of Pharm. ii. p. 274. f. 6; Wood and Bache, Disp. U. S. (1867) p. 206; Harris, Injurious Insects (1862), p. 137. f. 62; Packard's Guide, f. 454. *Lytta marginata*, Fabr. S. E. p. 260; Brandt and Ratzb. ii. t. xviii. f. 11. *Meloe cinereus*, Forst. Nov. Sp. i. p. 62. *Epicauta cinerea*, Leconte, Cat. Col. U. S.

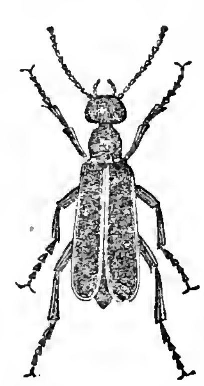

Fig. 10.—*Lytta marginata.*

Inhabits North America and (according to Fabricius) the Cape of Good Hope.

This is somewhat larger than *C. vittata* and of a different shape. The elytra are black, with the suture and margin ash-coloured. The head, thorax and abdomen are black, but nearly covered with an ash-coloured down; and on the upper part of the abdomen, under the wings, are two longitudinal lines of a bright clay colour. The insect is usually found in the latter part of summer, upon different species of *Clematis*, and frequents especially the lower branches which trail along the ground. Professor Woodhouse, of Philadelphia, first ascertained its vesicating properties; but it had previously been described by Fabricius as a native of the Cape of Good Hope. Dr. Harris, of Massachusetts, found it equally efficient as a vesicatory with any other species of the genus. The following is Harris's graphic description of this insect:—

"There is a large blistering-beetle which is very common on the virgin's-bower (*Clematis virginiana*) a trailing plant, which grows wild in the fields and is cultivated for covering arbours. I have sometimes seen this plant completely stripped of its leaves by these insects during the month of August. They are very shy, and when disturbed fall immediately from the leaves and attempt to conceal themselves among the grass. They most commonly resort to the low branches of the clematis, or those that trail upon the ground, and more rarely attack the upper parts of the vine. They also eat the leaves of various kinds of *Ranunculus* or buttercups, and, in the Middle and Southern States, those of *Clematis viorna* and *crispa*. This beetle is the *Cantharis marginata* of Olivier, or margined *Cantharis*. It measures $\frac{6}{10}$ or $\frac{7}{10}$ of an inch in length. Its head and thorax are thickly covered with short grey down, and have a black spot on the upper side of each; the wing-covers are black, with a very narrow grey edging; and the under side of the body and legs are also grey."

This is one of the species commonly employed in the United States of America, and is enumerated as such in Wood and Bache's 'Dispensatory.'

ASH-COLOURED BLISTER-FLY, *Lytta cinerea*, Fabr. —Fabr. Syst. ii. p. 80; Brandt and Ratzb. ii. t. xviii. f. 13; Pall. Ic. p. 98. t. E. f. 30; Leconte, Syn. p. 339. *Lytta Fabricii*, Lec.; Durand, Journ. Phil. Coll. Pharm. ii. 274. f. 5; Wood and Bache, U.S. Disp. (1867), p. 206; Harris, Injurious Insects, etc. (1862), p. 138. f. 63; Packard's Guide, p. 480. f. 453 *a*.

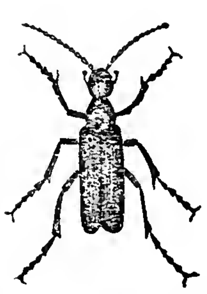

Fig. 11.—*Lytta cinerea.*

Found in the Northern and Middle States of North America.

The ash-coloured *Cantharis* closely resembles the potato-fly in figure and size, but differs from it in colour. The elytra and body are black, without the yellow stripes that characterize *C. vittata*, and are entirely covered with a short and dense ash-coloured down, which conceals the proper colours of the insect. The feelers are black, and the first and second joints are very large in the male. This species also inhabits the potato plants, and is occasionally found on other plants, as the English bean and wild indigo. It is a native of the Northern and Middle States. Illiger in 1801 discovered its vesicating properties, but Dr. Gorham was the first to call public attention particularly to the subject, in a communication addressed, in the year 1808, to the Medical Society of Massachusetts.

The most destructive kind of *Cantharis* found in Massachusetts is of a more slender form than *C. marginata*, and measures only $\frac{11}{20}$ to ^{6} of an inch in length. Its antennæ and feet are black, and all the rest of the body is ashen-grey, being thickly covered with a very short down of that colour. Hence it is called *C. cinerea*, or the ash-coloured *Cantharis*. When the insect is rubbed, the ash-coloured substance comes off, leaving the surface black. It begins to appear in gardens about the 20th of June, and is very fond of the leaves of the English bean, which it sometimes entirely destroys. It is also occasionally found in considerable numbers on potato vines; and in Cambridge, Massachusetts, it has repeatedly appeared in great profusion upon hedges of the honey-locust, which have been entirely stripped of foliage by these voracious insects. They are also found on the wild indigo-weed.

In the night, and in rainy weather, they descend from the plants, and burrow in the ground or under leaves and tufts of grass. Thither also they retire for shelter during the heat of the day, being most actively engaged in eating in the morning and evening. About the 1st of August they go into the ground and lay their eggs, and these are hatched in the course of one month. The larvæ are slender, somewhat flattened grubs, of a yellowish colour, banded with black, with a small reddish head and six legs. These grubs are very active in their motions, and appear to live upon fine roots in the ground; but I have not been able to keep them till they arrived at maturity, and therefore know nothing further of their history (Harris).

(*To be continued.*)

Chapters for Students.

CHEMICAL NOTES TO THE PHARMACOPŒIA.

BY WILLIAM A. TILDEN, D.SC. LOND.

DEMONSTRATOR OF PRACTICAL CHEMISTRY TO THE PHARMACEUTICAL SOCIETY.

POTASSÆ CARBONAS.—[§ K_2CO_3 with about 16 per cent. of water of crystallization.

Obtained from commercial pearlash, the product of the lixiviation of wood-ashes, by treating the pearlash with its own weight of distilled water, and evaporating the solution so formed to dryness, while it is kept briskly agitated.]

Wood-ashes still supply us with all the carbonate of potassium required in so many great manufactures, notwithstanding that more than one attempt has been made to procure that salt from other and especially mineral sources.

Of course, carbonate of potassium does not exist in the tissues of the plants from which it is obtained, but is the result of incinerating the various organic salts present therein. These salts (tartrates, citrates, malates, oxalates, etc.) contain at least one atom of carbon to every atom of potassium, and by burning them in the air they leave a residue of carbonate. It was, in fact, called salt of tartar, from having been formerly prepared from the cream of tartar, or acid tartrate of potassium. Wood-ash contains varying proportions of other salts, such as the sulphate and chloride of potassium, as well as silica. These are for the greater part got rid of in the process of lixiviation, shortly described in the Pharmacopœia.

Carbonate of potassium is recognizable by its deliquescence, by effervescing with acids, and by forming with hydrochloric acid a solution which with perchloride of platinum gives a yellow precipitate of the double chloride, $PtCl_4 . 2 KCl$. It always contains traces of silica, sulphate and chloride. A very pure carbonate can be readily made if required by heating crystals of the bicarbonate to dull redness.

[§ Test. 8·3 grams require for neutralization at least 98 cubic centimetres of the volumetric solution of oxalic acid.] This shows the presence of 81·4 per cent. of K_2CO_3. For since 100 c. c. are required to neutralize 6·9 gram of carbonate of potassium, or $\frac{1}{20}$ of a gram-molecule, 98 c. c. indicate 6·762 gram, and this quantity in 8·3 grams is 81·4 per cent.

POTASSÆ CHLORAS, $KClO_3$.—Formerly chlorate of potassium was prepared by passing chlorine gas into a hot solution of the carbonate or hydrate of potassium. The nature of the reaction will be further discussed under bromide and iodide of potassium; it is as follows:—

$$6KHO + 3Cl_2 = 5KCl + KClO_3 + H_2O.$$

But inasmuch as five-sixths of the potash is thus rendered comparatively valueless by being transformed into chloride, the happy idea of substituting an equivalent quantity of lime was adopted.

According to the Pharmacopœia, carbonate of potassium and slaked lime are mixed together, damped with water and saturated with chlorine by passing the gas into the mixture. The mass usually assumes a pinkish colour from the conversion into permanganate of a minute quantity of manganese, mechanically carried over into it with the chlorine. It is boiled with water, filtered from the insoluble carbonate of calcium, and evaporated to the crystallizing-point. The mother liquors, after the deposition of the chlorate of potassium, retain chloride of calcium. The reactions by which these three salts are formed, consist probably in the formation of chlorinated lime in the first instance, and the transformation of this compound by boiling with the alkaline carbonate into the soluble chlorate and chloride and the insoluble carbonate.

$$1.)\ \underset{\text{Lime.}}{CaO} + \underset{\text{Chlorine.}}{Cl_2} = \underset{\text{Chlorinated Lime.}}{CaOCl_2} = CaCl(ClO).$$

$$2.)\ \underset{\text{Chlor. Lime.}}{6CaCl_2O} + \underset{\text{Carbonate of Potassium.}}{K_2CO_3} =$$

$$\underset{\text{Chloride of Calcium.}}{5CaCl_2} + \underset{\text{Carbonate of Calcium.}}{CaCO_3} + \underset{\text{Chlorate of Potassium.}}{2KClO_3}$$

Chlorate of potassium forms rhomboidal plates, soluble in about 16 times their weight of cold, and about $1\frac{1}{2}$ time their weight of boiling water.

[§ It explodes when triturated with sulphur. Its solution is not affected by nitrate of silver, nor oxalate of ammonia. By heat it fuses, giving off oxygen gas, and leaves a white residue (KCl), readily forming with water a neutral solution, which is precipitated white by nitrate of silver, and yellow by perchloride of platinum.] The action of a moderate heat is at first to produce a mixture of perchlorate and chloride.

$$2KClO_3 = KClO_4 + KCl + O_2.$$

A higher temperature expels the whole of the oxygen.

Sulphuric acid evolves from chlorate of potassium a yellow gas, chloric peroxide (Cl_2O_4), which explodes when gently heated.

Hydrochloric acid gives a yellow gas, formerly called *Euchlorine*, which is a mixture of chlorine with one of its oxides.

The following are the acids formed by chlorine in union with hydrogen and oxygen; they are all monobasic.

Acids.		Potassium Salts.	
Hydrochloric .	HCl	Chloride . .	KCl
Hypochlorous .	$HClO$	Hypochlorite .	$KClO$
Chlorous . .	$HClO_2$	Chlorite . .	$KClO_2$
Chloric . . .	$HClO_3$	Chlorate . .	$KClO_3$
Perchloric . .	$HClO_4$	Perchlorate .	$KClO_4$

POTASSÆ CITRAS.—Citric acid neutralized with carbonate of potassium, and the solution evaporated to dryness.

$$3K_2CO_3 + 2H_3C_6H_5O_7$$
$$= 3(H_2O \cdot CO_2) + 2K_3C_6H_5O_7.$$

[§ Its solution mixed with solution of chloride of calcium, remains clear till it is boiled, when a white precipitate separates readily soluble in acetic acid.] The non-precipitation in the cold distinguishes it from the tartrate.

THE CULTIVATION AND USE OF THE DANDELION IN INDIA.

BY JOHN R. JACKSON, A.L.S.,
Curator of Museums, Royal Gardens, Kew.

The dandelion is perhaps one of the most cosmopolitan of medicinal plants, for besides being an actually recognized article in pharmacy, it is also largely collected and used by the peasantry in rural districts in liver complaints and in cases of dyspepsia. *Taraxacum officinale*, Wiggers (*Leontodon Taraxacum*, L.), is very widely distributed through Europe, Central Asia, North America and the arctic regions. Several varieties of the plant are known in this country, some of which have been dignified into species. The commonest variety is that mostly found on cultivated ground and known as *Taraxacum Dens-leonis*, Desf., which has bright green runcinate-pinnatifid leaves and the bracts of the involucre recurved. The plant has great powers of reproduction, both by its roots and by the pappus seeds, which are easily wafted by the winds to distances, where they readily germinate and establish themselves.

The plants grow abundantly throughout the Himalayas, where two or more distinct varieties are known; one is described as having large double flowers, quite the size of a rupee, and another with small single flowers, rather larger than a sixpence. The larger-flowered form is said to possess medicinal properties in by far the greatest degree. The plants are likewise cultivated in various parts of India, and the roots are collected between the months of September and February. To cultivate the plants properly, the following plan is recommended:—The seeds should be sown in beds, and the young plants, when sufficiently grown, should be planted out on ridges at a distance of nine inches from each other. This system of planting is the best suited for the production of large roots, which is the principal end to be obtained, and, to further ensure this result, the flowers should be gathered as they open. The roots, after they are taken up, are washed clean and wiped dry.

Taraxacum roots are used in a variety of ways in India; one useful form is that of a paste, which is made by pounding the fresh roots, putting the mass into tins or jars and gently baking or heating in an oven; when cool, the paste is ready for use and can be kept for a long time. To prepare dandelion-coffee, the roots are washed, dried in the sun and cut up into small pieces, after which they are roasted in a similar manner to true coffee; they are then ground, and to every nine ounces of coffee one ounce of pounded dandelion-root may be added; these proportions make an excellent and useful beverage. The use of this coffee in India has been much recommended.

Lieutenant Pegson, in a communication to the Agri-horticultural Society of India, advocating the more general cultivation and use of the dandelion, says, "Medical men admit the value of this preparation, and I know several gentlemen in India who are, by their own admission, kept alive by the daily use of *Taraxacum*-coffee. It is fairly entitled to be called a specific for the cure of torpid liver, a complaint from which the majority of Europeans suffer; the fact being made known when they proceed to a cool or hill climate and shiver and shake with cold while the thermometer is at 62° F. only. The sallow complexion of such men, women and children, their languid movements and their enjoyment of heat, all alike proclaim that they are suffering from sluggish action of the liver. The conserve of *Taraxacum* may be made into syrup for use. Horses and valuable dogs, sheep and poultry, all suffer in India from disease of the liver. A bolus of *Taraxacum* conserve to a horse, and a pill thereof to a fowl, would be most beneficial and act as a curative agent. Rabbits also suffer greatly from liver disease, but if they were supplied with a few (two to four) green *Taraxacum* leaves twice or thrice a week, the mortality resulting from this (hitherto) incurable disease would disappear, and rabbits could then be extensively raised for the market."

CONTRIBUTIONS TO THE HISTORY OF THE OPIUM ALKALOIDS.*

BY C. R. A. WRIGHT, D.SC.

Lecturer on Chemistry in St. Mary's Hospital Medical School.

PART III.

(*Continued from page* 506.)

3. *Action of Sodium Carbonate on the Compound* $C_{68}H_{86}I_2N_4O_{12}4HI$.

On adding sodium carbonate to the scarcely warm aqueous solution of this compound a voluminous white precipitate is produced, which is apparently a mixture of three bases, two of which contain iodine, whilst the third is free from that ingredient. The first one, which forms only a small fraction of the whole, is the free base of the original compound, $C_{68}H_{86}I_2N_4O_{12}$; this is readily soluble in ether, and may be obtained as hydriodate (as previously stated) by digesting the precipitate with ether, and agitation of the extract with hydriodic acid, whereby the original substance is reproduced. To prevent frothing, the precipitate must be well drained from the aqueous portion. By continuing the extraction until some 6 litres of ether have been employed for exhausting the precipitate from 40 grms. of original substance, the whole of this base is removed, or nearly so. Attempts to prepare the base itself by evaporation of the ether yielded only a tarry substance which could not be removed from the vessel employed; treatment with water or alcohol more or less decomposes it.

* Read before the Royal Society, November 16, 1871.

By employing a large bulk of ether after this first base has been almost wholly removed, an extract is obtained from which on evaporation solid flakes separate; these are much less soluble in ether than the first base, and after drying at 100° gave the following numbers, indicating the formula $C_{68}H_{81}IN_4O_{10}$.

0·1985 grm. gave 0·4705 CO_2 and 0·119 H_2O.
0·1210 grm. gave 0·2600 AgI.

	Calculated.		Found.
C_{68}	816	65·81	64·65
H_{81}	81	6·53	6·66
I	127	10·24	11·61
N_4	56	4·52	
O_{10}	160	12·90	
$C_{68}H_{81}IN_4O_{10}$	1240	100·00	

Apparently these flakes still retained a trace of the first base; the mother-liquor from which they separated, when evaporated to dryness, left a small amount of residue containing 14·18 per cent. of iodine. Treated with hydriodic acid, these flakes gave a hydriodate yielding these numbers after drying at 100°:—

0·3675 grm. gave 0·6335 CO_2 and 0·181 H_2O.
0·371 grm. gave 0·2405 AgI.

	Calculated.		Found.
C_{68}	816	46·58	47·00
H_{85}	85	4·85	5·47
I_5	635	36·24	35·02
N_4	56	3·20	
O_{10}	160	9·13	
$C_{68}H_{81}IN_4O_{10}, 4HI$	1752	100·00	

Evidently a slight loss of iodine has occurred from the action of the adhering moisture while drying, as the original flakes contained rather too high a percentage of iodine. This base is formed from the original one by the reaction—

$$C_{68}H_{86}I_2N_4O_{12}, 4HI = 2H_2O + HI + C_{68}H_{81}IN_4O_{10}, 4HI,$$

identical with that taking place on treatment with water.

A portion of the substance left after extraction with ether was treated several times successively with large bulks of ether (about 4 litres of ether to 10 grms. of precipitate each extraction). After the majority of the substance had thus been dissolved, a portion of the last ether extracts was evaporated down and yielded flakes agreeing approximately with the composition required for a mixture of 1 molecule of $C_{68}H_{81}IN_4O_{10}$, and 2 molecules of $C_{68}H_{80}N_4O_{10}$.

0·3565 grm. gave 0·926 CO_2 and 0·237 H_2O.
0·376 grm. 0·255 AgI.
0·2455 grm. gave 0·170 AgI.

	Calculated.	Found.	
C	70·67	70·84	
H	6·96	7·39	
I	3·67	3·66	3·73

From the foregoing experiments it is clear that the action of sodium carbonate on the compound

$$C_{68}H_{86}I_2N_4O_{12}, 4HI$$

is identical with that of water described in (2), the two bases, $C_{68}H_{81}IN_4O_{10}$ and $C_{68}H_{80}N_4O_{10}$, being the principal products.

On precipitating in a similar way the compound

$$C_{68}H_{82}I_2N_4O_{10}, 4HI,$$

the same reaction appears to take place; from the precipitate ether extracts only traces at first, indicating probably that the base $C_{68}H_{82}I_2N_4O_{10}$ is not produced in any quantity; as apparently the more highly iodized bases are more soluble in ether.

On treating the compound $C_{68}H_{82}I_2N_4O_6, 4HI$ in the same way, an analogous reaction seems to ensue; the precipitate is very sparingly soluble in ether, and on treatment with hydriodic acid furnished a hydriodate of which 0·233 grm. dried at 100° gave 0·142 AgI; hence I=29·94 per cent.; the compound $C_{68}H_{88}N_2O_{10},4HI$ requires 31·13 per cent., whilst the original substance requires 40·53 per cent.

4. *Action of Hydriodic Acid on some of the foregoing substances.*

As the action of water on the three compounds first described is to remove the elements of HI associated with the carbon radicals of the bases, it was thought probable that by treating the products of the action of water on these compounds with strong boiling hydriodic acid, the HI thus lost might be again added on. A reaction of this nature does indeed take place, but does not always stop at the reproduction of the original bodies, another equivalent of HI being also added on; moreover, in some instances a number of molecules of H_2O are likewise taken up, and are not separated from the compounds ultimately formed even by some days' exposure to a temperature of 100°.

On treating the compound $C_{68}H_{80}N_4O_{10},4HI$ with about ten parts of 55 per cent. of hydriodic acid (a little piece of phosphorus being also added to prevent separation of iodine from the HI by the heat) and heating to boiling, a syrupy liquid is obtained, from which water precipitates (after filtration of phosphorus) a tar resembling in all its physical characters the compound $C_{68}H_{86}I_2N_4O_{12},4HI$; it contains, however, the elements of $HI+10H_2O$ more than this substance. The same substance apparently is generated by treating the intermediate compound

$$C_{68}H_{81}IN_4O_{12},4HI$$

with hydriodic acid in the same manner.

(A.) From the compound $C_{68}H_{80}N_4O_{10},4I$; dried at 100° till constant:—

0·3565 grm. gave 0·483 CO_2 and 0·158 H_2O.
0·3835 grm. gave 0·278 AgI.

(B.) (A) dried twelve hours more at 100°, had turned a much darker colour, probably indicating absorption of oxygen:—

0·329 grm. gave 0·434 CO_2 and 0·155 H_2O.
0·561 grm. gave 0·419 AgI.

(C.) From the compound $C_{68}H_{81}IN_4O_{10},4HI$:—
0·377 grm. gave 0·485 CO_2 and 0·175 H_2O.
0·387 grm. gave 0·2855 AgI.

	Calculated.		Found. A.	B.	C.	Mean.
C_{68}	816	36·69	36·95	35·98	35·09	36·01
H_{111}	111	4·98	4·93	5·24	5·16	5·11
I_7	889	39·98	39·16	40·35	39·87	39·79
N_4	56	2·52				
O_{22}	352	15·83				
	2224	100·00				

$C_{68}H_{107}I_3N_4O_{22},4HI$.

Hence this body is formed by the equations—

$$C_{68}H_{80}N_4O_{10},4HI+3HI+12H_2O= \\ =C_{68}H_{107}I_3N_4O_{22},4HI.$$

$$C_{68}H_{81}IN_4O_{10},4HI+2HI+12H_2O= \\ =C_{68}H_{107}I_3N_4O_{22},4HI.$$

On treating the compound $C_{68}H_{88}I_3N_4O_{10},4HI$ in the same way, a product is obtained only differing from the original substance by one equivalent of HI; dried at 100°:—

0·3995 grm. gave 0·6800 CO_2 and 0·197 H_2O.
0·3215 grm. gave 0·2200 AgI.

	Calculated.		Found.
C_{68}	816	46·36	46·41
H_{93}	93	5·28	5·48
I_5	635	36·09	36·97
N_4	56	3·18	
O_{10}	160	9·09	
$C_{68}H_{89}IN_4O_{10},4HI$	1760	100·00	

Hence this body appears to have been formed by the reaction $C_{68}H_{88}N_4O_{10},4HI+HI=C_{68}H_{89}IN_4O_{10},4HI$, no water having been taken up; whilst in the case of the other non-iodized base, 3 molecules of HI and 12 of H_2O are assimilated.

In order to see if the combined action of phosphorus and hydriodic acid would transform the compound

$$C_{68}H_{86}I_2N_4O_{12},4HI$$

into the body $C_{68}H_{82}I_2N_4O_6,4HI$, the former compound was dissolved in about 10 parts of 55 per cent. hydriodic acid, and boiled until most of the acid had volatilized; a considerable quantity of phosphoric acid was formed during the reaction, and on precipitating the compound produced with water, and drying at 100°, the following numbers were obtained:—

0·2795 grm. gave 0·3900 CO_2 and 0·136 H_2O.
0·4195 grm. gave 0·327 AgI.
0·4225 grm. gave 0·333 AgI.

	Calculated.		Found.	
C_{68}	816	38·42	38·06	
H_{107}	107	5·04	5·41	
I_7	889	41·85	42·12	42·59
N_4	56	2·64		
O_{16}	256	12·05		
$C_{68}H_{103}I_3N_4O_{16},4HI$	2124	100·00		

From these numbers it appears that the substance produced may be considered as formed by the reactions,

$$C_{68}H_{86}I_2N_4O_{12},4HI + 8HI= \\ =I_8 + 6H_2O + C_{68}H_{82}I_2N_4O_6,4HI.$$

$$C_{68}H_{82}I_2N_4O_6,4HI + HI + 10H_2O= \\ =C_{68}H_{103}I_3N_4O_{16},4HI.$$

It is not easy to explain why the reaction should stop short at the end of the first stage, when codeia is treated with hydriodic acid and boiled up to 130°; possibly the presence of a much larger quantity of phosphorus acids in this case may tend to present the second reaction ensuing.

5. *Discussion of the Foregoing Results.*

From the complex constitution of the substances described above, it is at present thought unadvisable to attempt to give names to them. All the bodies previously mentioned may be regarded as being derived from one or other of the two bases $C_{17}H_{21}NO_3$, and $C_{17}H_{21}NO_2$ by multiplication of the molecule, and addition or subtraction of the elements of water and of hydriodic acid.

These two (hypothetical) bases contain H_2 more than morphia and deoxymorphia respectively; denoting the first by the symbol X, and the second by Y, the following general formulæ will indicate all the compounds previously described:—

$$4X + mHI + nH_2O,$$
$$4Y + mHI + nH_2O.$$

Thus the following table illustrates the mutual relations of the compounds described:—

Source of Compound.	Formulæ.
(A) Codeia, HI, and P at 150°	$C_{68}H_{86}I_2N_4O_{12},4HI=4X+6HI$.
(B) Do. 110° to 115°	$C_{68}H_{82}I_2N_4O_{10},4HI=4H+6HI-2H_2O$.
(C) (A) treated with water or Na_2CO_3	$C_{68}H_{81}IN_4O_{10},4HI=4X+5HI-2H_2O$.
(D) Free base of (C). (A) treated with Na_2CO_3	$C_{68}H_{81}IN_4O_{10}=4X+HI-2H_2O$.

Source of Compound.	Formulæ.
(E) Further action of water on (C) . .	$C_{68}H_{80}N_4O_{10},4HI=4X+4HI-2H_2O$.
(F) Action of HI on (E)	$C_{68}H_{107}I_3N_4O_{22},4HI=4X+7HI+10H_2O$.
(G) Codeia, HI, and P at 135° . . .	$C_{68}H_{82}I_2N_4O_6,4HI=4Y+6HI-2H_2O$.
(H) Action of water on (G)	$C_{68}H_{88}N_4O_{10},4HI=4Y+4HI+2H_2O$.
(I) Action of HI on (H)	$C_{68}H_{89}IN_4O_{10},4HI=4Y+5HI+2H_2O$.
(J) Action of HI on (A)	$C_{68}H_{103}I_3N_4O_{16},4HI=4Y+7HI+8H_2O$.

Although it may well happen that further researches may show that some of the above formulæ require some slight correction, the analytical numbers not always agreeing together absolutely accurately, yet the following points may be considered established:—

(1.) The action of hydriodic acid on codeia polymerizes it, the ultimate compounds formed being derived from at least four molecules of codeia. Hydrobromic acid also polymerizes codeia, but not so completely as hydriodic acid, there being found, in addition to the tetra-bases, compounds which (from their crystalline character and other physical properties) are apparently derived from 1 molecule only of codeia. Hydrochloric acid does not appear to have a marked polymerizing effect on codeia.

(2.) Hydriodic, hydrobromic and hydrochloric acids all eliminate methyl from codeia, forming ultimately compounds containing $n\,C_{17}$.

(3.) The compounds got by the action of hydriodic acid in presence of phosphorus indicate that the carbon groups contained in codeia are in an eminently "unsaturated" condition, being capable of taking up several molecules of HI and of H_2O, forming compounds not decomposed at 100°; 2 equivalents of hydrogen for every C_{17} being also added on in every case.

PAPER MANUFACTURE IN JAPAN.

Europeans are so accustomed to attribute a great proportion of the development of civilization amongst themselves to the invention of the art of printing, and the kindred and necessary art of paper-making, that they are apt to lose sight of the fact that both arts were practised in eastern Asia centuries before they were known in Europe. With regard to the introduction of paper-making into Europe, Eustathius, who wrote towards the end of the twelfth century, stated that the Egyptian papyrus had gone into disuse but a little before his time; in Germany, at the end of the fourteenth century, the art was still a secret one, the workmen being bound by oath not to teach it to any one else, or to make paper on their own account; whilst it is doubtful whether the first paper-mill in this country was erected before the latter part of the sixteenth century. In Japan, however, paper appears to have been imported from the Corea as early as the third century, and the manufacture in that country probably dates from a period as early as the year 610 A.D. But whilst, in China, the process of printing is very much the same as it was fifteen hundred years ago, the art of paper-making, although still carried on in the rudest manner, has been so improved in Japan, that it has developed into an industry of far more importance in that country even than the corresponding manufacture in England. The list of articles fabricated by Japanese ingenuity from paper outstrips, by far, in length a similar English list, even allowing for the very considerable increase that has taken place since the removal of the paper duty. It includes such unlikely things as sun and rain umbrellas, handkerchiefs, soldiers' hats, waterproof rain coats, tobacco pouches, and string, whilst several different kinds of paper are specially prepared for ornamenting and tying up the hair. A net coat, which is worn next the skin in warm weather by the Japanese, and will wash, is made by rolling strips of strong paper into a sort of string, and then working them by hand into a neat net pattern. A paper hat, similar to our straw hats, is also made by the paper being twisted, plaited, shaped and varnished.

But the development that has at present taken place in the paper-manufacture of England has resulted in a great dearth of suitable materials for carrying it on. Almost every species of tough fibrous vegetable or animal substance, such as the roots and barks of trees, the bine of hops, the tendrils of the vine, hollyhock, cabbage and nettle-stalks, the common thistle, sugar-cane, beetroot, wood shavings, sawdust, hay, straw, willow, esparto, and the like, have been experimented upon at different times with more or less success. But the want still exists and is increasing.

It is not therefore surprising that, under these circumstances, attention should be turned towards a country in the economy of which paper-manufacture plays so large a part, and that an attempt should be made to ascertain whether any of the sources from which the Japanese obtain their supply of material could be made available to the English manufacturer. In a dispatch to Sir Harry Parkes, dated May 13, 1869, the late Lord Clarendon requested that information on the subject should be collected and transmitted to this country. The results, in the shape of three reports, from her Majesty's consuls at Kanagawa (illustrated by a very curious series of facsimiles from Japanese pictures, showing the details of the manufacture), Nagasaki and Osaka, were presented to Parliament during the last session, and have recently been printed. From these reports we propose to extract a few particulars that may prove of interest.

The manufacture of paper from the paper-mulberry (*Broussonetia papyrifera*) was introduced into Japan about A.D. 610, by Shôtoku Taishi, a son of the reigning mikado, who, seeing that the paper previously made did not take ink well, would not bear rough handling and tore very easily, and moreover was liable, because of its material, to become worm-eaten, had recourse to the paper-mulberry. From it he made four kinds, called unshi, shiku-inshi, haku-jushi, and zoku-hakushi, and he caused it to be extensively planted all over the country, and the mode of paper manufacture to be largely promulgated among the people.

In the island of Kiusiu the paper-mulberry, or makôdzu is planted in the ninth and tenth moons, but in Kioto and its vicinity in the first moon, the time varying according to the climate of the place. Some old roots are separated and cut down to a length of about three inches; these are planted so that a little less than half an inch appears above ground. They grow about a foot high in the first year, and in the second to a height of two or three feet. In the third year they reach a little over four feet; in the fourth year they attain to six, or if particularly fine, to even nine and twelve feet. Each year in the tenth moon they are cut down to the roots, and from each stalk five branches appear the next year, so that in five years a large and dense shrub is developed. The cuttings of the fifth year's growth are used for making paper. The roots will not thrive well in old ground; the best place for planting is round the edges of new-made ground or paddy-fields. They will not flourish near salt or brackish water, nor beside millet or hum. If under-manured they die, and if too much manure is used the plant is injured. If planted in the vicinity of other crops, such as rice, they rejoice in the effects of the manure which is used for their neighbours. They are sometimes planted on mounds which are raised along the beds of valleys, but newly-turned ground is the best.

The paper-mulberry suffers from sunburn in a very dry summer; while if there is too much rain it grows too fast, and is then injured by the autumnal winds. Care has to be taken to protect the plants from the ravages of wild boar and deer, which delight to feed upon them. The shrub known as "Ts'kuri-kake" is the best for making paper of, but it is scarce and expensive. There is also a variety called "kajiso," which makes good paper, but as it is more plentiful it is not so dear, though it is necessary to use a great deal of it. Another variety is called "takaso." Paper made of this is somewhat inferior, but tho shrub attains a great height, and it is not necessary to divide the roots; a cutting of it may be planted just as it is cut, and will thrive, and it does not require so much attention as the "makôdzu" as regards manure; it will also thrive in swampy ground. It needs little care, and produces a tolerably large quantity of material for paper; and at present this variety is largely cultivated. The shrubs, like other trees, bud in spring, blossom in summer, and cast their leaves in autumn: by the twelfth moon they are quite bare.

The mulberry stalks are cut into lengths of two and a half to three feet, and steamed until the skin of the stalk begins to separate at the cut ends.

After steaming, the skins are stripped from the stalks and dried. They are then tied up in bundles and exposed to the action of running water for a period varying from twelve to twenty-four hours. The outer dark skin is scraped off by drawing it under a knife that is held in a stationary position by the right hand. This dark scraping is thoroughly washed in running water, which causes it to open out flat, and boiled. It is then allowed to rot, well beaten and used in making an inferior kind of paper.

The inner fibre is taken to the river in bundles and thoroughly washed; and afterwards steeped in buckets of water. The water is run off, and heavy stones are placed upon the fibre to express the remaining liquid. It is next boiled in water in which the ashes of burnt buckwheat have been infused until all the sticky or glutinous matter is got rid of, it is then called "sosori." Great care has to be taken to secure an even boiling, and when a difficulty occurs—as it sometimes does, and is generally believed to be the work of the Inugami, or devil,—the boiling is assisted by throwing in wax-ash or common lime; but this is likely to affect the colour of the paper, and give it a reddish hue. The sosori is again washed to remove all traces of the buckwheat infusion by placing it in a basket, through which running water is allowed to percolate, and it is afterwards strained.

The night before the paper is to be made, the "sosori" should be again washed, and the next morning it is pounded for about as long a time as "it takes to boil the rice for breakfast." When paper is made in the winter, a little "tororo" must be mixed with the "sosori" before pounding; when in spring, rice paste is used as a substitute, but the paper made with rice paste is not esteemed to be of so good quality, and is liable to become worm-eaten.

The "tororo" flowers in spring; the seed is enclosed in the flower, and is small and hexagonal in shape, resembling the sesamum. Neither the flower nor the seed are of any use in the manufacture of paper, but the root is used. The shrub is not unlike the cotton plant. The root is taken after the flower has died and dried. The sprouts and skin are scraped off, and the root is then beaten. When required for use the "tororo" roots are boiled into a tolerably thin paste, and strained through a fine hair sieve.

In making the paper called "hanshi," the "sosori" to be used is made into a large ball, from which lumps are broken off as required. These lumps are cast into what is called the "boat," and thoroughly mixed with well-strained "tororo" paste.

The apparatus consists of the inner frame, the outer frame, and the false bottom, made of plaited bamboo.

The false bottom is placed in the outer frame, into which a portion of the pulp is then poured. The inner frame is next fitted in to keep the false bottom steady, and a peculiar and dexterous jerk is given to the whole, which sets the paper. The frame is then placed against the upright rest to allow the water to drain off, while another one is prepared. By the time the second frame is ready the first may be removed. This manipulation can be performed very quickly by experts in the manufacture.

The sheet of paper is removed from the frame with a piece of bamboo, by dexterously curling the thicker end of the paper round it; a brush is taken in the right hand, and with it the paper is laid on the drying-board, the side which adheres to the board being the face of the paper. Five sheets are placed on each side of the board, which is 6 feet long.

Between every 20 sheets two or three straws are inserted. The paper, in parcels of 100 sheets, is then cut and made up into bundles ready for the market.

Another source of material for paper-making in Japan is the kaji-tree, which grows more or less all over Japan, and is cultivated much in the same manner as the tea-plant and mulberry-tree. It grows to a height of some 6 or 8 feet, and thrives best in dampish ground. In some districts it is produced on the hillsides. The bark is stripped off in the autumn, and is at once ready to be used for paper-making. The branches are left either to decay or are cut away, and fresh shoots are produced before next autumn, when the same process is gone through. The tree or shrub of the kaji resembles the willow of our country, and thrives well near water and in a mild climate. It is, however, also found in the north of Japan, but does not flourish in such perfection in a cold region.

Consul Annesley writes:—"There are no reasons why the kaji-tree should not flourish in England, more especially if planted in a damp soil, and when it is considered that paper could no doubt be manufactured from this bark at a cheaper rate than it could be made from rags, added to the considerable strength it can attain, and the various useful purposes to which it can be applied, the cultivation of the kaji shrub in England is well worthy of a trial.

"Some inquiry after this bark has been made by home paper-manufacturers from merchants at this port, and samples have been sent to England, where its value will no doubt be appreciated and turned to account."

The following method is employed by the Japanese in the manufacture of paper from the bark of the kaji-tree:—The rough bark is soaked in water for several hours, and the outer rind separated; it is then again washed, then boiled, after which it is beaten with mallets until it forms a sort of pulp; then the pulp is placed in a sort of reservoir about 6 feet square and 1 foot deep, containing cold water, and is stirred about with a large flat ladle made of wood until it is entirely dissolved. A sort of size (obtained from the inner bark of a tree called "ousuke" soaked in water) is mixed with the preparation, which is now ready to be drawn up, and is effected by the help of two frames made of wood and bamboo, of such dimension as the sheet of paper is intended to assume. Between these two frames a very thin matting of bamboo is placed, which acts as a sieve, and when the preparation is drawn up, it is moved on this frame, till the required substance is obtained. The sheet thus made is then deposited on another sieve. The same process is recommenced, and when another sheet is ready it is placed over the first; a strip of straw is laid on the edge to separate each sheet, so as to obviate the risk of their adhering together, and to enable each sheet to be taken up separately. When about a dozen sheets have been thus formed into a layer, they are taken up singly and spread on boards to dry in the sun. By the same process old paper is made into fresh sheets, with the addition of a size obtained from the decoction of a creeper called "sane kadzura," which grows on the hills around Nagasaki, and gives consistency to the solution. The manufacture of old paper into new can apparently be repeated as often as desired.

A paper-cloth that is "warranted to wash" is prepared by coating the paper with a paste made by boiling and pounding a root called "kon-niaku-no-dama." From this cloth may be made boxes, trays, saucepans which sustain no injury over a charcoal heat, bags in which wine may be put and heated by insertion in boiling water, and windows that will withstand the wind and rain. Imitation leather and waterproof papers are made by mixing oil with the pulp. The juice of parsimmon is also sometimes used in making paper intended to resist damp.

It is said that the Japanese are acquainted with the method of manufacturing paper from rags, but never adopt it, preferring to make it from the bark of trees.

DOUBLE IODIDE OF MERCURY AND COPPER.

BY MM. WILLM AND CAVENTOU.

When sulphate of copper is added to a boiling solution of iodomercurate of potassium (HgK_2I_4) free iodine is disengaged abundantly, and a dark brown powder is immediately deposited, which assumes a fine red colour in cooling, and contains mercuric iodide and cuprous iodide. The salient character of this compound is that, whether suspended in water or dried, it becomes darker in colour when heated and reassumes its red colour upon cooling, without undergoing any alteration from the successive changes of temperature.

M. Mensel considers this substance to be a mixture of two iodides. The authors, on the contrary, consider that it constitutes a well-defined compound. Its colour when cold is darker than that of the mercuric iodide; and it is difficult to conceive that a mixture of red iodide of mercury and the little-coloured cuprous iodide could be darker than the mercuric iodide. Moreover, the mercurio-cuprous iodide, treated cold with iodide of potassium, is decomposed very slowly, although iodide of potassium dissolves mercuric iodide with facility. But if it be heated, the mercuric iodide dissolves and the cuprous iodide remains.

Upon submitting the cuprous iodomercurate to analysis, the authors obtained results according nearly with the formula $Hg(Cu_2)I_4$. The analysis was made by decomposing the iodide by a plate of zinc, precipitating the filtered liquor by nitrate of silver and redissolving the metals in nitric acid. The mercury was separated from the copper either by precipitating it in the state of calomel, or by treating the sulphides with nitric acid, which only dissolves the sulphide of copper. The quantity of cuprous iodide remaining after the action of boiling iodide of potassium was also determined. The formula $HgCu_2I_4$ requires 45·56 per cent. of cuprous iodide, and 46·4 per cent. was obtained.

Further evidence that there is a real combination is found in the fact, that when treated with ammonia this iodide yields two kinds of crystals, both containing mercury and copper. When the cuprous iodomercurate is boiled with ammonia a blue solution is obtained, and a very dense liquid that congeals upon a slight lowering of the temperature. The blue liquid, filtered, deposits upon cooling long blue needles, which are an ammoniacal compound of mercurio-cupric iodide. The formation of a cupric compound is easily explained by the liberation of the metallic mercury which remains in the congealed mass. The authors have not yet completed their investigation of this ammoniacal compound, it being rendered difficult by the nearly constant presence of other crystals.

The mass, dissolved by boiling water, slightly ammoniacal, yields green crystals containing both mercury and copper, the latter being in the state of copperas. These green crystals appear to be simply a product of the addition of ammonia to the mercurio-cuprous iodide. In fact, when exposed to the air or treated by an acid they reproduce the double iodide, red when cold and black-brown when heated, without loss of iodine. The blue crystals on the contrary, which are also transformed into double iodide upon desiccation, lose their iodine before losing the whole of their ammonia.

The authors consider that this preparation might be utilized in medicine.

THE SIMULTANEOUS DISTILLATION OF WATER AND CERTAIN ALCOHOLS INSOLUBLE IN WATER.*

BY MM. I. PIERRE AND E. PUCHOT.

The authors in the course of their investigation of the products of alcoholic fermentation have noticed that when a mixture of pure amylic alcohol and water is submitted to distillation, the temperature of the liquid rises rapidly to 96° C.; the liquid, at that point, enters into full ebullition, and the temperature becomes remarkably constant. The result of the distillation is a turbid mixture of water and amylic alcohol, which separates quickly into two layers; the upper consisting of amylic alcohol, the lower of water only. When the two layers of condensed liquid were examined at various times during the distillation, it was found that during the whole of the operation, as long as the temperature was maintained at 96° C., the volumes of water and amylic alcohol condensed were in the constant proportion of two to three respectively. This continued until the supply of one or other of the substances was exhausted; if the original mixture had consisted of less than two volumes of water to three of amylic alcohol, the residue was found to be amylic alcohol, but, if of more, the residue was found to be water. In the latter case the temperature rose rapidly to 100° C., in the former to 130° C.

This triple result—the uniformity of the boiling-point; a boiling-point lower than that of the most volatile of the two liquids; and the constancy of the proportions in which the two liquids distil simultaneously—appeared to the authors to point to a general law, of which it would be advantageous to find the expression, rather than to an isolated fact; they, therefore, submitted to the same process a mixture of water and butylic alcohol, which in its slight solubility resembles amylic alcohol. The ebullition was at first a little irregular and sometimes tumultuous, but was easily controlled by the addition of some pieces of platinum wire and one or two pieces of pumice-stone. In the presence of an excess of water the temperature rose to 90°·5 C., and then remained remarkably stationary until the entire disappearance of the butylic alcohol. On examining the condensed products during the distillation, it was constantly found that they were in the proportion of five parts of butylic alcohol to one part of water. If the distillation was continued after the exhaustion of one or other of the constituents of this mixture, the boiling-point rose to 100° C. if the water predominated, and to 108° C. if the butylic alcohol was in excess. Thus, in this experiment, as in the first, it was found that the boiling-point was constantly lower than that of the most volatile of the two substances, and that the proportions of the two liquids that distilled simultaneously were also constant.

In the case of the mixture of water and amylic alcohol the boiling-point was lowered—

Compared with that of water . . . . 4° C.
Compared with that of amylic alcohol . 34° C.

In the case of the mixture of water and butylic alcohol, the boiling-point was lowered—

Compared with that of water . . . 9°·5 C.
Compared with that of butylic alcohol 17°·5 C.

* Comptes Rendus, vol. lxxiii. p. 599, and *Journal de Pharmacie et de Chimie,* 4th ser. vol. xiv. p. 244.

This result having been well established, experiments were next made with a mixture of three substances, water, amylic alcohol and butylic alcohol. It was then found that in this case the temperature of ebullition was no longer constant; it rose continually from the commencement to the end of the distillation, but was always confined between 90°·5 C. and 96° C. It appeared to rise in proportion as the relative quantity of amylic alcohol in the mixture was greater.

The proportion of water which distilled over augmented with the boiling-point of the mixture; but while it was always more than one-sixth of the total product (the proportion in the mixture of water and butylic alcohol), it was always less than two-fifths of the volume (the proportion in the mixture of water and amylic alcohol).

It seems to result from this, that a mixture of water, butylic alcohol and amylic alcohol, submitted to distillation, yields a product increasingly poor in butylic alcohol and increasingly rich in amylic alcohol, and that the separation of these two substances is progressive, as it is when a mixture of them is treated in the absence of water.

Pending further investigation into this interesting subject, which it is hoped will permit of more general conclusions, the authors consider themselves justified in laying down the following propositions:—

1. When a binary mixture of water and amylic alcohol, or water and butylic alcohol, is submitted to distillation, the boiling-point remains stationary until only one of the two liquids remains in the retort.

2. The boiling-point is always below that of the most volatile liquid.

3. In each of these mixtures the relative proportions of water and alcohol which distil over are constant, but these proportions are not the same for both mixtures.

4. When a ternary mixture of water, amylic alcohol and butylic alcohol is submitted to distillation, the boiling-point no longer remains constant; it varies according to the relative proportions of the two alcohols, but always remains lower than that of the most volatile of the three liquids, and ranges between those of the two binary mixtures before mentioned.

5. The proportion of the quantity of water to that of the mixture of alcohols which passes over with it, is not constant, but augments with the temperature of the mixture; it is always, however, within the limits of the corresponding proportions previously observed in the binary mixtures, that is to say between one-fifth and two-thirds.

In a future memoir the authors propose to bring forward other analogous facts, and to attempt to draw from them conclusions that may be turned to practical account.

In a letter to M. Dumas the authors have communicated the results of a series of observations made upon a mixture of 220 cubic centimetres of distilled water (boiling-point 100° C.) and 215 cubic centimetres of amylic valerianate (boiling-point 190° C.). A great constancy was observed in the temperature of ebullition and in the relative proportions of the two liquids that passed over. The results are thus stated:—

(1.) The boiling-point of the mixture remained constant at 100° C., that is to say, at 90° below the boiling-point of amylic valerianate.

(2.) The relative proportions of the two liquids condensed remained the same as long as the retort contained an appreciable quantity of the least abundant of the two liquids.

(3.) This constant proportion was that of 65 to 35; or, more simply, 13 volumes of water against 7 volumes of amylic valerianate. In weight the proportion would be 13 to 6.

BROMINATED CAMPHOR.*

Professor Deneffe, of Ghent, states (*Presse Méd. Belge*, November 19) that for more than two years he has employed a combination of camphor and bromine, which he thinks is entitled to general attention. The celebrated chemist Laurent showed that bromine will easily unite with camphor at the ordinary temperature, but that the product is slowly decomposed by exposure to the air. M. Swartz, Professor of Chemistry at Ghent, has shown that this body heated in a closed vessel is resolved into hydrobromic acid and a crystallized compound which is monobromized camphor (*camphre monobromé*), a body differing only from ordinary camphor by the substitution of an atom of bromine for an atom of hydrogen. It is a perfectly crystallized substance, fusible at 76° C. and boiling at 274°. At Professor Swartz's request, M. Deneffe has investigated the therapeutical properties of this body, and has found it to be an excellent sedative for the nervous system. He intends shortly to publish his cases in proof of this, and, in the present communication, furnishes one of these, in which excitement of the nervous system passing into true delirium tremens was effectually relieved. He prescribed it in the form of pills, seventy grains being made into thirty pills, of which one was given every hour until twenty had been taken. For three days longer from forty-five to sixty grains were given in the twenty-four hours, the quantity being diminished from forty-five to thirty grains daily for a week longer. The recovery was progressive and stable.

THE ARTIFICIAL PRODUCTION OF CALCAREOUS SUBSTANCES, SUCH AS ARE FOUND IN THE ORGANISM.

BY M. HARTING.†

M. Harting announces in a preliminary note that he has succeeded in imitating the greater number of the forms which carbonate of lime assumes in the organism, such as biliary and other concretions, the various forms of otolites, pearls, coccolites, the spicules of the alcyonaria, the various substances which form the shells of molluscs, the calcification of cartilage, the calcareous couches of the scales of osseous fishes, etc. He has not yet succeeded in imitating the pieces of the tegumentary skeleton of the echinodermata, or the osseous substance of the vertebrate skeleton. His method of procedure was to imitate nature in regard to the length of the process. He formed the calcareous combinations in organic fluids by means of double decomposition, retarded by very slow diffusion. The paper is not yet ready in all its details.—*Journal of the Chemical Society.*

METHODS FOR DETERMINING THE QUALITY OF CASTOREUM.

BY M. HAGER.

M. Hager gives the following methods for determining the quality of castoreum:—

(1.) The taste of Siberian castoreum is much more pronounced than that of Canadian, in consequence of its greater richness in castorine, of which it contains 4·6 per cent., whilst Canadian contains but 1·98 per cent. The castorine may be easily obtained by exhausting the castoreum with pure benzine, and evaporating the product upon a watch-glass, when the castorine will be left mixed with a certain quantity of volatile oil.

(2.) Treated with chloroform, castoreum yields a sepia-brown resin, which has a stronger odour, and is more viscous in the Siberian than in the Canadian.

(3.) If powdered castoreum be treated first with alcohol and afterwards with dilute hydrochloric acid, a

* Reprinted from the *Medical Times and Gazette.*

† Compt. Rend. lxxiii. 361.

liquid is obtained, in from ten to twenty hours, which from Canadian castoreum is yellow or light brown, and from Siberian castoreum is dark brown.

(4.) The Siberian castoreum powder when macerated for some hours in an ammoniacal solution gives a darker liquid than the Canadian.

(5.) The alcoholic tincture forms with water a milky liquid, which, upon the addition of a little ammonia, becomes clear if the tincture is made with Siberian castoreum, but remains cloudy if made with Canadian.—*Journal de Pharmacie et de Chimie.*

OBSERVATIONS IN PRACTICAL PHARMACY.*

BY CHARLES SYMES, PH.D.

(*Concluded from page* 505.)

Suppositories.—These, as also pessaries and bougies, are now prepared more or less by most pharmaceutists. Those manufactured by wholesale houses are necessarily of some recognized composition and strength, and the pharmaceutist who purchases these only, finds himself awkwardly placed when they are required according to special formulæ; and in my experience this is most frequently the case. The demand, however, varies considerably in different establishments, and it becomes desirable that a simple and inexpensive means of preparing them should be in the hands of every one in the business. Some two or three years since, Mr. Redford exhibited at one of our evening meetings a small arrangement for forming tinfoil into moulds which were supported in a dish of sand; and, after trying various methods, I have fallen back on tinfoil as the simplest form of mould. It is only necessary to cut it into small pieces, and roll it round the end of a piece of hard wood shaped into the form of a suppository, bougie or pessary, as the case might be, rolling it in the palm of the hand or on the counter to remove the creases, and the mould is ready; but the support? I have found sand very inefficient unless a large surface is used; especially in the case of pessaries, they are liable to be pressed out of shape. A tin box, the lid of which drops inside to the depth of about half an inch, and which is perforated to receive metal shapes of the desired size, these being sunk below the level of the cover, forms an excellent support; it is clean to work with, the suppositories are easily removed, and in the summer, if rapid cooling is required, the box might be filled with cold water or ice and water. In the PHARMACEUTICAL JOURNAL for July a paper is published by Mr. Goodman, in which he says, referring to the materials of which suppositories are formed, "The British Pharmacopœia directs a mixture of lard and wax, which has a melting-point above the temperature of the body, viz. 140°." This gentleman had evidently got hold of the 1864 Pharmacopœia; and it struck me as being rather remarkable that such a go-ahead people as the Americans should not be aware that this volume had become obsolete, and superseded by a considerably better one in 1867; and, further, that such a statement should have been published and passed in our Journal (as far as I am aware) without comment. As you are all doubtless aware, the British Pharmacopœia directs the vehicle of suppositories to be formed chiefly of cocoa butter, with the addition of small quantities of lard and wax; but I have found cocoa butter *alone* to be much better than a mixture of the three at almost all temperatures, and, at the same time, their preparation is facilitated; in very warm weather the addition of a small quantity of pure white paraffin helps to give them consistency, and is far better than wax. In operating with the unmixed material, the medicine should be rubbed with a little of the melted butter on a warm slab, and returned to the bulk of the vehicle when it is just beginning to thicken.

Watery extracts (as of belladonna) are often prescribed in suppositories, and, in addition to being rather troublesome to prepare, they are not very efficient; in my opinion, the extract in getting divided into small particles surrounded by fatty matter is prevented, to a great extent, from acting on the mucous surface to which it is applied, and in melting the butter carries these particles away, without much effect having been produced. A more elegant and efficient suppository is prepared by rubbing the extract with grated cocoa butter in a mortar thoroughly, then slightly melt and rub together again for some little time, lastly melt and strain; this has an uniform bright green appearance, is very efficient as a medicinal agent, and might be kept ready prepared in mass, merely diluting with cocoa butter to produce suppositories of the desired strength when required. With regard to ext. opii being administered in this form, it is much less efficient than opium in powder, and is, I believe, often prescribed by medical men without any idea of this, or of the difficulty in preparation; and I think it is a duty incumbent on us to call their attention to such facts, by this means we should do away with many difficulties in dispensing, such as appear in the PHARMACEUTICAL JOURNAL weekly, and render good service to the profession.

We are all advocates of the separation of prescribing from dispensing; but if we do not take our proper position, and communicate more freely the results of our experience to the medical profession, we shall frustrate the chief object for which this separation is desirable, viz. elegance and efficiency in medicine. As further illustration of these latter remarks, let me call your attention to prescriptions containing tinctura guaiaci, such as the following:—

℞ Tinct. Guaiaci ℥ss
Pot. Bicarb. ʒij
Spt. Æther. Nit. ʒiij
Aquæ ad ℥vj. M.

Now mix these ingredients in whatever order you please and the resin will deposit in lumps, partly floating and partly adhering to the sides of the bottle, and no amount of shaking will distribute it evenly through the mixture again.

If, however, the proportionate quantity of powdered guaiacum (12 grains to ʒj) be first rubbed with a portion of the water, and in finishing the mixture the proportion of spirit equivalent to the tincture be added, a homogeneous and tolerably elegant mixture is formed, the powder being easily distributed through the fluid when required, even after it has been prepared some time.

Any medical man, accustomed to prescribe a mixture similar to the above, will readily substitute the powder for the tincture, if his attention is called to these facts.

* Read at a Meeting of the Liverpool Chemists' Association, Nov. 23, 1871.

Insecticides.—Many of the *Anathemidæ*, such as chrysanthemums, chamomiles, etc., possess in the sexual parts of the flower a narcotic matter which has a great effect upon insects, and will even kill small ones. In *Pyrethrum roseum* and *P. carneum*, just within the disk, this matter is found in considerable quantity. In order to prepare the powder to advantage, only the centre of the flower must be used, which must be cut before the seed is fully formed. The Spaniards, to keep off gnats, burn the centres of the flowers of the horse daisy (*Chrysanthemum leucanthemum*); and the powder of the mayweed (*Anthemis Cotula*) has also been used for destroying insects. In some parts of Belgium this plant is fastened by the country people to branches where swarms of bees have settled (after they have been secured), to prevent them from leaving the hive. The Mohammedans and Tartars have long employed the powder of the *Pyrethrum* against all insects indiscriminately. To destroy flies, gnats and bugs, they burn it on an iron plate, which they heat slowly, in order to produce more smoke.—*Gardeners' Chronicle.*

The Pharmaceutical Journal.

SATURDAY, DECEMBER 30, 1871.

Communications for this Journal, and books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

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DRUGGISTS AND THE SALE OF BEER ADULTERANTS.

WE believe it to be a common opinion that the Pharmacy Act of 1868 is the only Act which regulates the sale of poisons, and specifies in its schedules what drugs are to be regarded as poisons. From a question which has lately been asked by a correspondent, we consider it desirable to direct attention to another Act, which may also in a certain sense be considered a Poison Regulation Act,—we mean the Act 56 GEO. III. c. 58, relating to the adulteration of beer; and, although some of the substances named therein are not poisons, those who violate its provisions render themselves liable to far more severe punishment than can be inflicted under the Pharmacy Act for the illegal sale of poisons. This Act, after specifying a great number of substances that cannot be legally used by brewers, contains the following comprehensive clause:—"Or any article or preparation whatsoever for or as a substitute for malt or hops;" a clause which is sufficiently elastic to include all articles not enumerated that can be used for the purposes named.

It will be seen from the wording of the above quotation that the offence does not consist in the addition to beer of substances deleterious to health, and that the prohibition of certain substances is simply on account of their being substitutes for articles subject to duty. We may remark, in passing, that the law in this, as in other instances, ignores altogether the public health, and has a single eye to the security of the revenue. However, this fact need occasion no surprise, for at the present time the same feeling exists, and no effort has been made, when framing very recent laws, to use language that will protect the public as well as the revenue.

To return to what constitutes adulteration under the Act, it must be mentioned that a slight modification has taken place on account of the repeal of the hop duty in 1862. Since September of that year no Excise penalty can be imposed on the brewer, dealer or retailer of beer for having or using any "article for or as a substitute for hops." This alteration, allowing brewers to receive and use any bitters, such as quassia, chiretta and gentian, restricts adulteration to those substances only which are substitutes for malt.

Whilst the brewer, dealer or retailer of beer who breaks the law is on conviction liable to a fine of £200, the druggist or other person who supplies adulterants within the meaning of the Act to any brewer, dealer or retailer of beer, *knowing* him or her to be so licensed or *reputed* to be so licensed, or shall sell, send or deliver, or cause or procure to be sold, sent or delivered, to any other person for or on account of the use of any such brewer, dealer or retailer, shall for every such offence forfeit £500. The framers of the Act were sufficiently considerate not to make the selling to a brewer, dealer or retailer of beer, an offence in the case of a person who did not at the time of sale know the occupation of the buyer. Such consideration would doubtless be of service in large towns, where brewers might with impunity obtain what they required from perfect strangers; but in country districts and small towns, where an established tradesman usually knows his customers, even if they live several miles from his place of business, there would be great difficulty in convincing a bench of magistrates that the vendor at the time of sale was ignorant of the trade of the person to whom such goods were sold.

We purposely abstained from running through the catalogue of prohibited substances when speaking of the liabilities of brewers, because we think it better to give the list in this place, when the pains and penalties attached to druggists or other dealers are under review. The Act especially mentions the following, because they are substitutes for malt, viz. molasses, honey, liquorice, vitriol, cocculus indicus, grains of paradise, Guinea pepper, opium, or any extract or preparation of the before-named substances. It is also stated to be an offence to sell, send out, or deliver to a brewer, dealer or retailer of beer any liquor called or known or sold as colouring, from whatever materials the same may have been made, for the purpose of darkening the colour of worts or beer. This restriction was found necessary, because brewers had been allowed, before the passing of this Act, to receive and use "a liquor prepared from sugar for colouring porter," and through the use of this liquor for colouring, great frauds were committed on the revenue. By a subsequent Act, however, brewers were allowed to prepare colouring from sugar on their own premises, but they cannot now legally receive any such preparation made elsewhere.

For a breach of the Pharmacy Act, as regards the sale of poisons, a fine not exceeding £5 for a first offence can be inflicted, but under the Beer Adulteration Act the fine is £500. Since the latter punishment is so severe, it might, perhaps—in the event of that part of Mr. BRUCE's Licensing Bill which deals with beer adulteration becoming law—be a matter for serious consideration whether an addition should not be made to the Pharmacy Act, specifying the articles that cannot legally be sold to brewers or dealers in beer. A conviction under the Act would, to many, be ruin; and as the Legislature considers the sale of prohibited articles to brewers and dealers in beer a more serious offence than the sale of poisons to the public, it cannot be said that the subject is too unimportant for action to be taken in the matter. The law supposes every man who embarks in any trade to be acquainted with the Acts of Parliament governing that trade, and on this account we have directed attention to the Act 56 Geo. III. c. 58, to impress upon our readers the necessity of exercising great caution when trading with brewers or other persons engaged in the beer trade.

MEDICAL DECLARATION RESPECTING ALCOHOL.

A memorandum has been published on the subject of the duty of medical men in regard to the prescribing of alcohol, which, from the long list of honourable and influential names appended to it, irrespective of the importance of the subject, merits careful consideration. It is as follows:—

"As it is believed that the inconsiderate prescription of large quantities of alcoholic liquids by medical men for their patients has given rise, in many instances, to the formation of intemperate habits, the undersigned, while unable to abandon the use of alcohol in the treatment of certain cases of disease, are yet of opinion that no medical practitioner should prescribe it without a sense of grave responsibility. They believe that alcohol, in whatever form, should be prescribed with as much care as any powerful drug, and that the directions for its use should be so framed as not to be interpreted as a sanction for excess, or necessarily for the continuance of its use when the occasion is past.

"They are also of opinion that many people immensely exaggerate the value of alcohol as an article of diet; and since no class of men see so much of its ill effects, and possess such power to restrain its abuse, as members of their own profession, they hold that every medical practitioner is bound to exert his utmost influence to inculcate habits of great moderation in the use of alcoholic liquids.

"Being also firmly convinced that the great amount of drinking of alcoholic liquors among the working classes of this country is one of the greatest evils of the day, destroying, more than anything else, the health, happiness and welfare of those classes, and neutralizing, to a large extent, the great industrial prosperity which Providence has placed within the reach of this nation, the undersigned would gladly support any wise legislation which would tend to restrict, within proper limits, the use of alcoholic beverages, and gradually introduce habits of temperance."

Doubtless this memorandum will give rise to considerable discussion and divergence of opinion, but in any case the *British Medical Journal* and the *Lancet* are in accord on this subject (not being too closely connected with "circulation"); for while the one informs us the memorandum had its origin at an interview between the Secretary of the Temperance League and Mr. Ernest Hart, consequent upon some editorial remarks which appeared last September in its columns, the *Lancet* refers to sentiments expressed in an article published six weeks ago, as being in some cases very similar to, if not identical with, some points of the memorandum.

The *Medical Times and Gazette*, however, considers that there is a certain vagueness in the opening sentence, which might be construed to imply that the signataries believe medical men to be responsible for a large part of the intemperance of the day. Mr. F. C. Skey also, in a letter to the *Times*, objects to the memorandum as being "dictatorial, assailing the deliberate judgment of a large number of eminent members of the profession." He also doubts the existence of the "many instances" of "intemperate habits engendered by the medical administration of alcohol." And from a letter published in the *Medical Times and Gazette*, this opinion appears to be shared by Dr. Lionel Beale.

Another class who may be expected to express an opinion upon the matter are those who consider that the nature of the alcoholic drink makes a great difference, for at the recent meeting of the St. Andrew's Medical Graduates' Association, when Dr. B. W. Richardson pointed out that the different alcohols—ethylic, methylic, amylic, etc.—had very different physiological actions, this point was further illustrated by Dr. Shorthouse, who said he could support Dr. Richardson's opinion by great practical experience. He thought that effervescing wines were far less harmful than sherry or even bitter ale, and, amid great laughter, proceeded to inform the meeting of the quantity of champagne he drank daily. Champagne, he said, never did him any harm; he had drunk some before coming to the meeting, and would pledge himself at that minute to "thread a needle or to pick a flea's eye out."

THE CHICAGO COLLEGE FUND.

Professor Attfield, writing from the country, tells us that he is preparing a third list of donations for publication in the next number of the Pharmaceutical Journal. Contributions from provincial towns are beginning to flow in; subscriptions and books having been received from Edinburgh and Colchester. The Council of the Chemical Society has also presented a set of the Journal and Transactions.

The first election of Council of the Ontario College of Pharmacy, under the Ontario Pharmacy Act passed last February, has taken place. We notice that Mr. William Saunders and Mr. E. B. Shuttleworth (editor of the *Canadian Pharmaceutical Journal*) are respectively first and third on the list.

At the last Evening Meeting, Dr. Tilden called attention to a cabinet for holding labels so arranged as to prevent the confusion that sometimes arises from their becoming mixed. Though apparently only a matter of detail, the importance that may attach to it is shown by a case reported at p. 538, where the affixing of a poison-label to a harmless compound caused the druggist some anxiety; but had the conditions been reversed, and a poison been improperly labelled, the consequences might have been much more serious to him.

Transactions of the Pharmaceutical Society.

EXAMINATIONS IN LONDON.

December 20th and 22nd, 1871.

MAJOR.

The following five candidates presented themselves for the Major Examination, and, having passed, were declared duly qualified to be registered as Pharmaceutical Chemists:—

Brown, Frederic Peter ...... Grantham.
Jones, William Ellis .... Barmouth.
Keen, Benjamin .... Uppingham.
Brown, James .... Ampthill.
Forsbrook, William Henry.... Birmingham.

MINOR.

Forty-four candidates presented themselves for the Minor Examination; of these, *seventeen* failed. The following *twenty-seven* passed, and were declared duly qualified to be registered as Chemists and Druggists:—

*Greenish, Thomas Edward .. London.
*Stocks, Charles .... London.
*Kendall, Edward Basnipp .. Nottingham.
Equal. { *Cooper, Frederick Richard .. Manchester.
{ *Grace, Charles .... Hammersmith.
Equal. { *Canner, William............ Derby.
{ *Dale, John .... Birmingham.
Tucker, William Tyley...... Worthing.
Williamson, Nicholas ...... Whitehaven.
Goodlad, John Jonathan .... Birmingham.
Hockenhull, Philip Hall .... Macclesfield.
Windle, John Thomas ...... Norwood.
Place, John Newton .... Cambridge.
Hall, Edwin .... Weston-super-Mare.
Hensby, Robert Place ...... Maidstone.
Hawley, William .... London.
Springett, Normington ...... London.
Tuck, William James ...... Portsmouth.
Perks, Samuel Woodhouse ... Brighton.
Tamplin, George W. D. H. .. Bristol.
Jones, Morgan .... Chipping-Sodbury.
Oliver, Frederick Bailey ..... London.
Rossiter, John .... London.
Bannerman, Chas. Alexander Belfast.
Simpson, John.............. Lewes.
Lea, Harry .... Ellesmere.
Saul, William Benjamin .... Taunton.

The above names are arranged in order of merit.

PRELIMINARY.

Certificates were received from the undermentioned in lieu of this examination:—

Davenport, Thomas .... Wrexham.
(*Certificate of the College of Preceptors.*)

Thomas, Archibald .... Northampton.
(*Certificate of the Law Society.*)

Trood, Richard .... Bath.
Wright, Watkin Valentine.... Wrexham.
(*Certificates of the College of Preceptors.*)

* Passed with honours.

NORTH BRITISH BRANCH OF THE PHARMACEUTICAL SOCIETY.

The Second Meeting of the present Session was held in Craigie Hall, 5, St. Andrew Square, Edinburgh, on Wednesday evening, 20th December, at 8.30; Mr. Baildon, President, in the chair. There was a very full attendance.

After a few remarks by the Chairman, an interesting lecture was delivered by Dr. Stevenson Macadam, on "The Colouring Agents recently derived from Coal Tar." The subject was fully illustrated by diagrams and accompaniments, and at its conclusion the President proposed a cordial vote of thanks to Dr. Macadam. This was seconded by Mr. J. R. Young, and carried by acclamation. Dr. Macadam having replied, the meeting adjourned.

Provincial Transactions.

LEEDS CHEMISTS' ASSOCIATION.

The Third Meeting of the Session was held in the Clergy Room, Church Institute, on Thursday, December 21, 1871; the President, Mr. E. Brown, in the chair.

The minutes of the last meeting having been read and confirmed, Mr. Clapham was elected a member, and Messrs. J. W. Clapham, Shaw, Tingle, and J. Winder were elected associates.

Mr. Smeeton, referring to the Early Closing movement, could not report favourably of the chemists upon whom he was deputed to call; there appeared a disposition to close, but the want of unanimity was fatal to the cause.

Mr. T. B. Stead then read the paper of the evening, entitled "A Retrospective Glance of the Trade." During the reading of the paper, which had reference more particularly to local incidents, Mr. Stead observed that the promoters of the Early Closing movement might have occasion to regret the steps they were taking, inasmuch as if the assistants and apprentices instead of properly using the time squandered it away, more evil than good would be done.

Mr. Smeeton proposed a vote of thanks to Mr. Stead for his paper, which was seconded by Mr. Day.

The President had pleasure in supporting the vote of thanks, though he could not quite agree with the remarks referring to the earlier closing of chemists' establishments. It was quite true there was a doubt as to the manner in which some assistants would use the time thus allowed, but they were of an age to be answerable for their own deeds, and every master who took a proper interest in his apprentice would endeavour to guard against the danger referred to. According to the letters which had appeared during the past few months in the Pharmaceutical Journal, it would seem as though the writers ignored much of the practical work which formerly entered into the education of apprentices; the powdering of drugs in the iron mortar was now of rare occurrence, in consequence of the introduction of mechanical power, nevertheless he considered that every youth should have some practical work of this character. There seemed a growing disposition to leave the scientific education of apprentices to be conducted in schools of pharmacy.

The resolution was carried.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

Thursday, December 21, 1871; Professor Williamson, F.R.S., Vice-President, in the chair.

The usual business of the Society having been transacted, the Chairman announced that Professor Canizzaro had consented to deliver the Faraday lecture.

A paper was then read by Mr. H. Bassett, F.C.S., "On Eulyte and Dyslyte," two beautifully crystalline compounds obtained by the action of nitric acid on citraconic acid, a product of the dry distillation of citric acid. The two substances each contain nitrogen, but owing to the comparatively small quantity obtained, namely, somewhat less than two ounces from thirty pounds of citric acid, the author has as yet been unable to thoroughly investigate their nature.

Professor Armstrong also read a paper on "The Nitration Products of the Dichlorophenol Sulphuric Acids," being a continuation of his researches on the nitrochlorophenols.

The meeting then adjourned until the 18th of January, 1872.

ROYAL SOCIETY OF EDINBURGH.

Sir Robert Christison on the Fresh Waters of Scotland.

At the First Ordinary Meeting of the Royal Society of Edinburgh for the present session, held on Monday, December 4, the President, Sir Robert Christison, described some recent observations on the fresh waters of Scotland. These observations were classified by him under three heads—(1) the composition of the water of certain of the fresh-water lakes and of the streams which feed them, and the changes undergone by the waters of the streams which are fed by the lakes; (2) the temperature of the water at various depths in the lakes; and (3) the action of the waters on lead. He first directed attention to the general geological structure of this country, by which, in a great measure, the properties of the Scottish fresh waters are regulated. Generally, and particularly in the Highlands, the mountain summits are very pointed or rugged, and the mountains abound in precipices, crags and loose rocks, and the intermediate valleys, except in the course of the large rivers, are narrow and stony, and capable of little or no cultivation. Sometimes, however, and this chiefly in the Lowland hills, the spurs are ridgy and at times separated by upland valleys, boggy and abounding in peat. From this structure it followed that in most districts of the Highlands rain or snow took but little time to descend in streams to the lower grounds; and so the water of the Highland streams was uncommonly pure in dry weather, and not much less so in other kinds of weather. In the lower country streams generally were nearly as pure. The water of streams near Lochgoilhead might be taken as a fair type of the streams which feed the fresh-water lochs in that district; and the general results of some observations made last summer were, (1) that the water of those streams was almost entirely free from colour; (2), that, like most of the Highland streams, it contained a very small portion of saline and of organic matter—so small, that the ordinary tests scarcely affected the waters, the hardness of the water being about one-tenth that of the Edinburgh water; (3), that the water would affect lead. In winter time there was not so great a difference in the composition of the water as might naturally be expected. It assumed a somewhat brownish colour, but otherwise its purity was very great, and its effect on lead was, at the same time, more rapid. During long drought the composition of the water of the streamlets was much that of the springs from which in such times the streamlets were fed, and spring water had more saline matter, but was always colourless. The water of the lakes fed by these streams was much that of the streams. The water of the lowland lakes was somewhat differently constituted.

From want of time, Sir Robert Christison deferred the discussion of the last topic, the action of the waters on lead, to another opportunity.

PHILADELPHIA COLLEGE OF PHARMACY.

The Second Meeting of the session 1871–72 was held on Tuesday afternoon, Nov. 21, 1871; Dr. Wilson H. Pile presiding.

Mr. Charles Heinitsh, of Lancaster, Pa., presented a sample of capsicum, bearing a very small fruit, finely flavoured. It was raised from seeds brought from Mexico during the war. The species seems to be unknown.

Professor Maisch exhibited specimens of cundurango, received, since the last pharmaceutical meeting, from various parties. The flowering-branch and the pod of that variety of cundurango called "mata-perro," sent for exhibition by M'Kesson and Robbins, of New York, belong to a plant of the Natural Order *Asclepiadaceæ*, though not to the genus *Asclepias*. Authentic specimens of mata-perro, tumbo grande and tumbo chico, received from the same house, were likewise exhibited, and compared with a specimen coming from the State Department at Washington. The latter is a piece from a young branch, and probably identical with the tumbo grande, which, however, consists, in the specimens exhibited, of older bark only. The experiments of physicians with the cundurango first received in this country have not sustained its reputation. It remains to be seen whether mata-perro and tumbo chico possess valuablo medicinal properties; for the former, alterative properties and beneficial effects in syphilitic complaints are claimed. Various samples of cundurango met with in commerce consist of mata-perro and tumbo chico, the latter sometimes mixed with small and variable quantities of tumbo grande. The appearance of the decoctions of the three varieties, and their behaviour to ammonia and nitric acid, afford no reliable means of distinguishing them, as had been stated in a circular lately received.

Professor Maisch also exhibited South American and East Indian clove or culilawan bark. The former comes from *Dicypellium caryophyllatum*, Nees, and occurs in large quills, composed of several layers of the thin liber; the latter is the produce of *Cinnamomum Culilawan*, Nees, and comes in flat pieces, the taste resembling a mixture of cloves, cinnamon and sassafras.

Professor Parrish presented specimens of "Boldo" leaves and branches, brought by Dr. E. W. Burton from Concepcion, in Southern Chili, where it has a reputation among physicians and people as a specific remedy in chronic liver complaints. The tree was supposed by Dr. Burton to be a species of *Drimys*, probably *Drimys chilensis*, but the leaves are opposite, while those of all the *Magnoliaceæ* are alternate. The tree is an evergreen, growing 20 feet high, and is very abundant. The twigs or small branches are covered with a thin bark, perhaps a line in thickness, firmly adherent to the tough and fibrous wood. The wood is slightly, the bark very, aromatic; it is wrinkled longitudinally, covered with vesicles, light brown or fawn colour, much branched, with opposite very numerous branchlets; the terminal branches are very bushy. The leaves—which are described as of a dark though lively green colour on the upper surface, lighter on the under when fresh—are in this dry specimen reddish-brown, mottled with whitish spots, coriaceous, deeply marked with midrib and alternate, sometimes opposite veins, which are anastomosed and looped near the edges. They are conspicuously covered with vesicles and very aromatic, opposite, petiolate, entire, ovate, with a small stipule at the base. The flavour is grateful, and recalls that of chenopodium. The medicinal virtues of this tree were discovered by its marvellous effect on a flock of sheep enclosed in a corral formed of this tree. The sheep were much afflicted with a disease attributed to the liver, and by browsing on the leaves of the Boldo, constituting their enclosure, were restored to health. Large quantities of this drug are said to be exported from Chili to Peru, where it is highly valued.

Professor MAISCH read a paper on fluid extract of chestnut leaves.

Professor PARRISH exhibited specimens of "Perkins and Hyatt's Celluloid Base," patented for the use of dentists in making artificial dentures. This is composed of inspissated collodion combined with a certain proportion of camphor. At the temperature of 300° F. it softens so as to be perfectly adapted to the plaster cast of the mouth, and when cold is firm and somewhat elastic, much resembling the hard rubber plates so much in use. He also showed a convenient screw-press, flask and oil-bath, with thermometer attached, in which the base is moulded to fit the plaster cast. Although adapted to withstand any test experienced in actual use in the mouth, this substance is soluble in ether and alcohol, and at a temperature of about 330° F. is decomposed and volatilized. Touched by an ignited match, it was shown to burn rapidly, with much smoke.

Dr. PILE exhibited crystallized bromide of morphia, prepared by him by double decomposition between equivalent quantities of bromide of barium and sulphate of morphia. The crystals, which are very beautiful, acicular, and disposed in stellate groups, are very difficult to dry without losing their whiteness. He stated that this salt is sometimes prescribed as a remedy in nervous affections.

Dr. BRIDGES remarked that bromide of potassium has been found useful in correcting the effects of opium, and this combination may have been suggested by a knowledge of that fact.

Professor PARRISH exhibited so-called "divided medicines," patented by Fred. Kraus, of Cincinnati. They consist of sheets of gelatine containing, either in solution or suspended equally throughout, such medicines as calomel, opium, subnitrate of bismuth, sulphate of quinia, sulphate of morphia, and arsenious acid. Being of uniform thickness and definite outline, they are marked while yet soft with lines dividing them into twelve equal squares, each of which, by being cut out, will furnish a definite dose. He stated an objection to this form of administering soluble medicines, that the full impression is made upon the palate during their solution in the mouth, which must necessarily be protracted; the French wafer, on the contrary, by enveloping a nauseous medicine, so as to prevent its contact with the organs of taste, completely disguises it. The effect of moisture upon these gelatine sheets would seem to render them more perishable than many other pharmaceutical forms.

In the discussion which followed upon the eligibility of these medicines, Professor MAISCH spoke of their having been used in Germany and other parts of Europe for several years, and being first suggested and introduced by Professor Almén, of Upsala, Sweden. The elegant atropine and calabar disks of Squire, and those containing a variety of concentrated remedies made by Savory and Moore, are similar, though of greatly superior workmanship, and are especially adapted to be applied in the eye and for similar applications.

Professor MAISCH called attention to the recent observations in regard to the solvent action of citrate of ammonia, potash, soda and lithia upon various salts of iron and bismuth insoluble in water, and exhibited scales resembling the officinal pyrophosphate of iron, but composed of phosphate of sesquioxide of iron and citrate of potash. This salt was made by Mr. J. Creuse, of Brooklyn. It is surprising how long a time it took to make this discovery, while it has been well known for a number of years that soluble salts of iron, mixed with sufficient citric or tartaric acid, are not precipitated by potash, which has generally been attributed to the formation of a double salt. The discovery by Robiquet, in 1856, of the solubility of pyrophosphate of iron, and the observation by several, in 1859, of the solubility of the ordinary phosphate of iron in citrate of ammonia, failed to provoke similar experiments with citrate of potash and of soda, until the present time, by Mr. Creuse.

SOCIETY OF ARTS.

DYES AND DYE-STUFFS OTHER THAN ANILINE.*

BY DR. CRACE-CALVERT, F.R.S.

LECTURE III.

Blue Colouring Substances.—Indigo, Orchil, Cudbear, Litmus, Prussian Blue and Ultramarine.

(*Continued from page* 515.)

Returning from this digression, let us now enter on a description of the process of M. Marnas. He treated the lichens, as suggested by Dr. Stenhouse, with milk of lime, filtered the lime liquor off, precipitated the colour-giving principle from it with hydrochloric acid, and gathered the precipitate on a filter. This precipitate was well washed, dissolved in caustic ammonia, and the ammoniacal liquor kept at a temperature of 153° to 160° for twenty to twenty-five days, when, under the influence of that temperature, the colour-giving principles of the lichens fix ammonia and oxygen, and are transformed into a new series of products. These were separated from the liquid by the addition of chloride of calcium, which caused a fine purple lake to be deposited. This, after being washed and dried, was sold under the name of French purple.

To dye silk or wool with French purple, it is simply necessary to mix the lake with its weight of oxalic acid, boil with water, and then filter, the oxalate of lime remaining on the filter, while the colour passes through in the filtrate. This liquor is added to a slightly ammoniacal liquid in the dye-beck; all that is now necessary is to dip the silk or wool in the beck, when it will become dyed with magnificent purple or mauve.

To dye cotton, it is necessary to mordant it with albumen, or prepare it as for Turkey red, before putting it in the bath.

Robiquet was the first chemist to isolate a colourless principle from lichens susceptible of assuming a fine purple hue when brought in contact with ammonia and oxygen. This principle he named *orcine.* He obtained it by treating the *Variolaria orcina* by strong alcohol. This solution, on being allowed to cool, gives crystals, which, on being dissolved in water and allowed to crystallize, assume the form of large well-defined crystals of hydrate of orcine. By crystallization from ether anhydrous orcine can be obtained. Orcine gives a fine dark-red colour with perchloride of iron; but its most remarkable property is its transformation into *orcëine,* which Robiquet shows to be due to the following reaction:—

$$\underset{\text{Orcine.}}{C_7H_8O_2} + \underset{\text{Ammonia.}}{NH_3} + O_2 = \underset{\text{Orcëine.}}{C_7H_9NO_3} + \underset{\text{Water.}}{H_2O}.$$

Orcëine presents itself under the form of a brown powder, slightly soluble in cold water, to which it gives a red colour. It is soluble in alcohol, but insoluble in ether. It is soluble in alkalis and ammonia, to which it communicates a magnificent violet colour. It exists in commercial orchil under the form of orcëinate of ammonia.

Time will not permit me to describe the researches of Heeran and Sir R. Kane. I must therefore confine myself principally to a short description of those of Dr. Stenhouse and Dr. Schunck.

The chief merit of Dr. Schunck consists in having pointed out the connection which exists between the orcine of Robiquet, and the *erythrine* and *pseudo-erythrine* of Heeran, and in showing that orcine is the sole immediate colour-producing principle of the series. This he proved by his researches published in 1842, in which he treated the dried and powdered *Variolaria orcina*

* Cantor Lecture, delivered Tuesday, Feb. 21. Reprinted from the *Journal of the Society of Arts.*

by ether. On evaporating this solution, there remained a residue, from which he isolated a substance which he called *lecanorine* or *lecanoric acid*. This compound crystallizes in white needles, and gives a red colour with bleaching-powder, and a dark purple with perchloride of iron. It yields a similar colour when dissolved in ammonia and exposed to the atmosphere. Its most interesting property is its conversion into orcine and carbonic acid when boiled with an aqueous solution of baryta. The reaction is—

$$\underset{\text{Lecanorine.}}{C_8H_8O_4} = \underset{\text{Orcine.}}{C_7H_8O_2} + \underset{\text{Carbonic acid.}}{CO_2}.$$

He found also that on boiling lecanorine with alcohol it formed an ether, which proved to be identical with the pseudo-erythrine of Heeran.

Dr. Stenhouse has succeeded in extracting the important compounds to which he has given the names of *erythrite* and *orsellic acids*. The first-mentioned body is a product of the decomposition of erythrine under the influence of lime-water. The erythrine splits up into carbonic acid, orcine and erythrite, according to the following equation:—

$$\underset{\text{Erythrine.}}{C_{12}H_{16}O_7 + H_2O}$$
$$= \underset{\text{Erythrite.}}{C_4H_{10}O_4} + \underset{\text{Orcine.}}{C_7H_8O_2} + \underset{\text{Carbonic acid.}}{CO_2}.$$

The orsellic acids were obtained, one from the South American weed, the other from the South African. The first appears to be identical in composition with lecanorine, and is capable of splitting up under the influence of baryta or lime into carbonic acid and orcine. The one from the latter appears to be composed of lecanoric acid and a substance called roccellinine. According to Schützenberger, lecanoric acid may be made to undergo a decomposition into orsellic acid, or may be further converted into orcine.

The employment of orchil is at the present day comparatively limited, but it is still used for producing browns, maroons and other dark shades, in conjunction with other dye-stuffs. Its chief use is to top cheap indigo blues on woollen goods; this is effected by lightly dyeing the fabric with indigo (an expensive dye), and then passing it through a bath of orchil, which gives to the cloth a rich purple hue, similar in appearance to one dyed wholly with indigo.

Cudbear is a special preparation of orchil, first manufactured by Dr. Cuthbert Gordon, from whom it derives its name.

Litmus is obtained from the same lichens as those employed for producing orchil, only lime and carbonate of potash are added to the ground weed and urine; in fact, the process is very similar to that used in former times to produce orchil. After three or four weeks, a blue colour is fully developed, when it is mixed with sulphate of lime or chalk, dried, and is ready for market. The chief employment of litmus is to communicate a peculiar tint to the cheese made in Holland.

Prussian Blue.—I shall now have the pleasure of drawing your attention to one of the finest, brightest and most permanent colours known. It was discovered accidentally in 1710 by a colour manufacturer named Diesbach, of Berlin, from which it derived its name. The process by which it was produced was kept a comparative secret until 1724, when Dr. Woodward showed how the colour had become a very profitable affair, and described a process by which it could be obtained. The process has in time undergone many improvements; but I shall here confine myself to a description of it as now carried out. I shall be obliged here to enter slightly into theoretical chemistry.

Prussian blue is a combination of iron with *cyanogen*, a compound of carbon and nitrogen. There are two well-defined cyanides of iron corresponding to the two oxides, the *proto-cyanide*, Fe Cy, and the *sesquicyanide*, Fe_2Cy_3. These two cyanides, combining together in different proportions, give rise to the various shades of Prussian blue found in commerce. But, strange to say, you cannot produce either of these compounds, or Prussian blue, by the direct combination of cyanogen with iron. Cyanogen must be first united with potassium, giving rise to cyanide of potassium, under the influence of which salt the iron combines with cyanogen, and the cyanide of iron thus formed in its turn combines with the cyanide of potassium, forming a double cyanide. There are two double cyanides of potassium and iron; the first, called ferrocyanide of potassium, or yellow prussiate of potash; the second, ferri-cyanide, or red prussiate of potash. The formula may be represented as follows:—

Yellow prussiate . . Fe Cy + K Cy
Red prussiate . . . $Fe_2Cy_3 + 3KCy$.

To produce Prussian blue from these salts, it is necessary to replace the potassium by iron. This is effected by adding a persalt of iron to the yellow prussiate, or to the red prussiate a proto-salt of iron. The iron of the iron salt replaces the potassium of the double salts, and double cyanides of iron are produced, as seen by the following formulæ:—

$$\underset{\text{Yellow prussiate.}}{3(FeCyKCy)} + \underset{\text{Sesquichloride of iron.}}{Fe_2Cl_3} = \underset{\text{Prussian blue.}}{3FeCyFe_2Cy_3}$$
$$+ \underset{\text{Chloride of potassium.}}{3KCl.}$$

$$\underset{\text{Red prussiate.}}{Fe_2Cy3KCy} + \underset{\text{Protochloride of iron.}}{3FeCl} = \underset{\text{Prussian blue.}}{Fe_2Cy_3 3FeCy}$$
$$+ \underset{\text{Chloride of potassium.}}{3KCl.}$$

That this is the case can be easily demonstrated, for if you mix together a solution of persalt of iron and one of red prussiate, which contains only percyanide of iron, no Prussian blue is formed. Again, if you mix yellow prussiate of potash with protochloride of iron, you get no Prussian blue, because, in the first case, you have no protocyanide of iron present, and, in the second, you have no percyanide.

Simple as the production of Prussian blue appears, it requires much practice to prepare it with certainty as a pigment where a given shade of blue is required. It is seldom found pure in commerce, being generally mixed with starch, chalk or gypsum. Sometimes they are added with a view to deception, sometimes in order to produce a lighter shade of colour. The testing of a Prussian blue by chemical means is not, therefore, a true criterion of its quality. The method usually employed consists in grinding in oil equal weights of a Prussian blue of known value and of the one to be tested, white lead is added to each, and the intensity of the colours compared.

The best quality of Prussian blue is obtained by mixing a dilute solution of red prussiate of potash with protosalt of iron; the second quality is made by mixing yellow prussiate of potash with pernitrate of iron, and is called *Turnbull's blue*. Cheaper qualities are made by mixing solutions of yellow prussiate and protosulphate of iron (green copperas), which produces a pale blue precipitate. This is transformed into Prussian blue by the addition of bleaching-powder, which oxidizes part of the iron, and transforms the protocyanide into percyanide. For still lower qualities, alum is mixed with the iron solution previously to the prussiate being added. Alumina is by this means mixed with the blue.

Prussian blue was first obtained on silk fabrics in 1811 by a professor of chemistry at Lyons, named Raymond, in consequence of the high premium offered by the first Napoleon for the production of a fast blue, as indigo could not at that time be imported into France. His process, with slight modifications, is followed at the present day, although the colour is not much used, owing to the introduction of the aniline blues. It consists in dipping the silk, for several hours, in a salt of peroxide of iron, when the oxide of iron becomes fixed in the silk, which is washed and dipped in a slightly acid solution of yellow prussiate of potash. Prussian blue is thus produced on the silk, which only requires washing to be ready for market. The only improvement made in this class of dyeing has been the addition of a persalt of tin to the iron-salt.

The production of Prussian blue on cotton or woollen fibres is effected by a curious chemical reaction. At a temperature of 212° F., all acids, even the organic, such as oxalic, citric and tartaric, as well as the acid sulphates, possess the property of decomposing the two prussiates. The potassium of the cyanide combines with oxygen of the water and with the organic acid. The cyanogen thus liberated unites with the hydrogen of the water, forming prussic acid. The cyanide of iron liberated unites with the fibre of the cloth, and on the latter being passed into a weak solution of bichromate of potash or bleaching powder, or if it is left exposed to the air, part of the protocyanide of iron is converted into sesquicyanide, and Prussian blue is produced. As salts of tin greatly facilitate the fixing of the prussiate on the cloth, chloride of tin is now generally mixed with the prussiate of potash. In this case prussiate of tin is produced. To this mixture tartaric or oxalic acid is added; it is then properly thickened and printed on the calico. When the design is dry, the fabric is submitted to the action of steam, and the blue is produced on the fabric. It then only requires to be passed through a bath of bichromate of potash to develope the full depth of the shade.

Ultramarine Blue is a most valuable pigment, both on account of its cheapness and the brilliancy of its colour. It is used extensively in many branches of trade—by the calico-printer in pigment printing, by the paper-stainer and manufacturer, the typographic and lithographic printer, by the match manufacturer, the sugar refiner, and by the house decorator. The value of the pigment depends on the fineness of the powder and the brilliancy of its hue.

The greatest care and much experience are required in every stage of the manufacture, in purifying the substances employed, in mixing, in heating at the proper temperature, and in grinding, washing, and drying the manufactured mass. Fourteen distinct operations are required to produce it, and it would take too much time at this late hour to enter into the details of these processes. I will therefore only attempt to give you a very rough outline of the principal points of the manufacture.

The proportion of materials used may be as follows:—

White china, clay or kaolin	50	parts.
Sulphate of soda	19	„
Sulphur	25	„
Charcoal	12	„
Carbonate of soda	28	„
	134	

These substances are most intimately mixed together, and introduced into an earthenware crucible, which is carefully closed and heated at a temperature of about 500° F. for twelve hours. The temperature is then gradually raised till it reaches a white heat at the end of forty-eight hours; the fire is then removed, and the crucible allowed to cool gradually in the furnace. The mass, as taken out of the crucible, is of a beautiful bright green colour. It is ground, washed and dried, and then calcined in an open furnace to oxidize it; but as the slightest excess of oxidation spoils the colour, the workman from time to time adds a small amount of sulphur to the mass, by this means controlling the oxidation. The green mass gradually becomes blue, and is washed and dried, when it is ready for market.

The colouring matter of ultramarine is not well known. It is supposed to be a peculiar sulphate or hyposulphite of soda. The solid matter itself is a double silicate of soda and alumina. What is certainly worth notice is that, although we are ignorant of the true colouring matter of this pigment, we find its composition to be almost identical with that of the natural *Lapis lazuli*, which, although very costly, was employed by painters for many centuries. The following analyses will show the similarity of composition:—

	Lapis lazuli.	Ultramarine.
Silica	45·40	46·60
Alumina	31·67	23·30
Soda	9·09	21·46
Potash	*nil*	1·75
Iron	0·52	1·00
Lime	3·52	0·02
Sulphuric acid	5·89	3·08
Sulphur	0·95	1·68
Chlorine	0·42	trace
Water	0·12	*nil*
Loss	2·42	1·05
	100·00	100·00

Artificial ultramarine was discovered by a French chemist and druggist, named Guimet, who kept the process of its manufacture secret for many years.

Quercitron, Fustic, Persian Berries, Weld, Aloes, Turmeric, Annatto, Ilixanthine, Lakao, Tannin matters, Gall-nuts, Sumach, Divi-divi, Myrobalans, Catechu.

I shall have the pleasure of devoting the first part of this lecture to some of the most useful and important yellow substances used by dyers and calico-printers, and to one or two other colouring matters which, although scarcely commercially important, are interesting from a scientific point of view.

Among the most valuable of these bodies is *quercitron*, the bark (from which the epidermis has been removed) of a particular species of oak, called the *Quercus nigra* or *Quercus tinctoria*. This tree is indigenous to the United States of America, and is especially found in the forests of Pennsylvania, Georgia, and in North and South Carolina. A chemist, of the name of Bancroft, first introduced it to the English dyers in the year 1775. The most esteemed qualities are those imported from Philadelphia, New York and Baltimore. The bark, after being removed from the tree, is dried, and ground between millstones. The value of a sample bears a direct ratio to the fineness of the powder, for the woody fibre of the bark, which contains only a small quantity of colouring principle, is not easily reduced to a fine powder.

M. Chevreul was the first chemist who examined this dye, and he found it to contain a peculiar tannin, which has since received the name of *quercitannic acid*, and a yellow colouring principle, to which he gave the name of *quercitrin*, but which has since received the name of *quercitric acid* from M. Bolley.

M. Chevreul, by boiling quercitron bark in water, and allowing the aqueous solution to stand, obtained fine, laminated crystals, which were gradually deposited, and to which he gave the name of quercitrin.

M. Bolley followed a better process. He treated the bark by alcohol, precipitated the tannin from the alcoholic solution by gelatine, evaporated the alcohol, and obtained the quercitrin under the form of colourless crystals. These, under the influence of air or oxidizing agents, assume a bright yellow colour. The alkalis give quercitron a brownish tint, but its most characteristic property is to give a greenish-yellow precipitate with chloride of iron, and a beautiful bright yellow precipitate with protochloride and oxymuriate of tin.

M. Rigaud discovered, a few years since, by boiling quercitrin with water containing 10 per cent. of sulphuric acid, that it is a glucoside, which decomposes under the influence of the acid into glucose and quercetin according to the following formulæ:—

$$\underset{\text{Quercitrin.}}{C_{36}H_{40}O_{21}} + \underset{\text{Water.}}{2H_2O} = \underset{\text{Glucose.}}{2(C_6H_{12}O_6)} + \underset{\text{Quercetin.}}{C_{24}H_{20}O_{11}}.$$

Quercetin is a crystalline powder, of a bright lemon colour, and of a much richer hue than quercitrin. It has no taste, is insoluble in cold water, and only slightly soluble in hot, but is freely soluble in alcohol. It is soluble in alkalis, to which it communicates an orange-yellow hue. Its alcoholic solution gives orange precipitates with the salts of lime, baryta and lead. It assumes an orange colour with perchloride of iron.

Although quercitron bark gives a fine yellow colour on woollen goods, when mordanted with salts of tin, to which has been added alum or cream of tartar, still its employment has greatly decreased of late years, owing to its colour assuming a reddish hue when exposed to the atmosphere.

Within the last twenty years a preparation from it has been imported into this country from America, under the name of *flavine*, which in reality may be considered as commercial quercetin. It is now manufactured in England by two different processes. The first consists in boiling half a ton of quercitron bark with sixty-three pounds of soda crystals in about 2000 gallons of water; after boiling for about a quarter of an hour, 250 pounds of concentrated oil of vitriol are added. The whole is then maintained at the boil for two hours, when it is run off on to woollen filters, washed until free from acid, pressed and dried, and is ready for market. The second process, which I consider the better one, consists in boiling for two hours 100 parts of quercitron bark with 300 of water and 15 of oil of vitriol, and then washing, pressing and drying, as in the first process. 100 parts of quercitron bark gave 85 of flavine, which have a dyeing power equal to 250 parts of quercitron.

Flavine is not much employed in calico-printing as a yellow dye, its principal use being to communicate a brown and orange hue to madder reds.

The best mode of estimating the value of a sample of quercitron bark or flavine is to dye some mordanted cloth in the same way as in testing the value of a madder or garanceine.

(*To be continued.*)

Parliamentary and Law Proceedings.

A Wrong Label.

On Monday, December 18th, an inquest was held at Southport, on the body of a child ten months old, the son of Richard Rimmer.

From the evidence of the mother it appeared that as the child had been suffering from a cold, she had sent to the shop of Mr. Barrow for a pennyworth each of oil of almonds and syrup of violets. The bottle had a new label on when it came back, and she noticed that it was different to the one it had on when sent by her. She thought the new label was "Essence of Almonds," instead of "Oil of Almonds;" but it had on the word "Poison." On account of the different label being on the bottle she put it in the cupboard, declining then to give the child the mixture, and had never given it any until Saturday night last, when she took it from the cupboard, thinking the medicine might be right and the label wrong. She intended, during the week, to take it back to the druggist, but this she neglected. When sending for the mixture for the child, she also instructed the girl to purchase her a small quantity of antimonial wine, laudanum, and essence of aniseed, for her own cough, but she never gave any of the mixture to the little one. On the previous Saturday she gave the child a teaspoonful, when it appeared to be choked, and, notwithstanding her efforts to restore it, died shortly afterwards.

Dr. Davies stated that he was called in and found the child dead. On asking the mother what she had given it she showed him a bottle labelled, "Essence of Bitter Almonds—Poison." He took the bottle home, but could find no trace of essence of bitter almonds in the contents. He had made a *post-mortem* examination, and had come to the conclusion that death arose from suffocation, caused by spasm of the glottis, produced by the improper administration of the medicine whilst the child was screaming. Such an effect might have been caused by a drop of water or saliva, more particularly by a thick substance like syrup. The bottle he found to contain oil of almonds and syrup of violets, but it was wrongly labelled.

Mr. James Barrow, chemist and druggist, 209, Lord Street, was now examined. He remembered the girl coming for the mixture, and she was carefully supplied with the drugs asked for. Unfortunately the bad divisions in the drawer allow the labels to get mixed, but the label in question was taken from the right compartment. The labels had slipped from one partition to another. He said he could mention several instances where the same medicine had been taken regularly. He examined the medicine, and found it perfectly right. It did not contain any prussic acid, or any essence of bitter almonds. The oil of almonds is quite innocuous, and there is not one instance in which it has proved dangerous. The medicine was frequently used, and there was no necessity for him to put the word "poison" on the bottle. He assured the jury that he took every possible precaution to prevent accidents, and had supplied oil of almonds out of the same bottle for some time. The key of the poison cupboard he always kept in his pocket.

The coroner, in addressing the jury, said there was not much for them to do, as he thought the death was purely accidental. The result of the entire evidence showed that there had been no mistake whatever on the part of the chemist, with the exception, of course, of labelling the bottle, and in that there had been no harm. The mistake was in the mother not giving the child the medicine properly. The chemist could not be blamed in the least, but he should show more caution in getting the labels.

The jury consequently returned a verdict of "Died through misadventure."—*Southport Independent.*

American Diplomas.

On Thursday, December 21st, at Shrewsbury, Mr. Thomas Andrews, of Keltown, was charged with an infringement of the Medical Act, by falsely assuming the title of M.D. It was proved that defendant, who had been for some years a druggist in the town, had recently sent out a bill for professional attendance, had attached M.D. to his name, and had "M.D." painted underneath his name on a lamp in front of his door.* For the defence, it was shown that defendant had received a diploma of the Medical University of Pennsylvania; and Mr. Motteram, barrister, who appeared for the defence, contended that even if the college had no power to grant the diploma, if defendant believed that it had, the charge must fall to the ground, and cited cases in support of his view. He called Mr. George Lever to swear to the authority of the diploma, which he did. Being asked to read it (it was in Latin), the witness declined to do so; and, subsequently, said that the knowledge of Greek and Latin was looked upon as a secondary consideration in the medical university alluded to. He visited the university and attended lectures; but he believed diplomas, after an examination by a duly authorized board in this country, were granted. He had no idea, however, what the nature of the examination was.

The Bench fined defendant £20; but granted, on the application of Mr. Motteram, a case for the superior Courts.

* See Pharm. Journ., *ante*, p. 515.

Notes and Queries.

*** *In order to facilitate reference, correspondents are requested to mark their answers in each case with the title and number of the query referred to.*

No notice can be taken of anonymous communications. All queries or answers should be accompanied by the name and address of the writer.

[291.]—GOLDEN INK may be made by mixing finely divided gold-leaf or Dutch metal with thin gum-water. —J. TULLY.

TRANSPARENT CEMENT.—A very strong transparent cement, applicable to wood, porcelain, glass, stone, etc., may be made by rubbing together in a mortar two parts of nitrate of lime, twenty-five parts of water and twenty parts of powdered gum arabic. The surfaces to be united to be painted with the cement, and bound together until completely dry.—A. SELLE, in *Dingler's Polytechnisches Journal.*

GLUE FOR LABELS.—A good cement for attaching paper labels to bottles may be made by boiling a mixture of gelatine and dextrine in water. When dry, the labels should be covered with dammar varnish. —*Dingl. Pol. Journ.*

CLEANSING GLASS VESSELS FROM PETROLEUM.—Milk of lime, with which petroleum forms an emulsion, is recommended by F. Stolba in *Dingler's Polytechnisches Journal* (cci. 181) as the best means of cleansing glass vessels soiled by petroleum.

[294.]—A PRESCRIPTION.—A correspondent asks for our readers' opinions on the following:—

Purgers against red Choler.

Turbith, Confectio Hamech, Electuary of the juice of Roses, Scammony, Diaprunum solutive, Venice Treacle, Troches of Rhubarb, Troches de Eupatorio, Pills of Turbith, Electuarium, is wonderfully good for the above.

An ounce thereof giveth eight stools, & purgeth red choler.

[295.]—SOL. ACID. CARBOLIC. AROMAT.—Can any reader inform me what should be used when sol. acid. carbolic. aromat. is ordered in a prescription? I am unable to find any recognized formula.—T. A. S.

[296.]—NAPHTHALINE.—*F.P.* (Manchester) wishes for information as to where he may find a demand for pure naphthaline.

[297.]—CHEMICAL FLY-PAPER.—"*Nil Admirari*" would be glad of a receipt for chemical fly-paper.

[298.]—SYRUP. FERRI ET QUINÆ HYPOPHOSPHATIS.—*W. S. N.* asks for a formula for syrup. ferri et quinæ hypophosphatis.

[299.]—MEDICATED LOZENGES.—*J. Williams* wishes to be furnished with directions for making medicated lozenges.

The following journals have been received:—The 'British Medical Journal,' Dec. 23; the 'Medical Times and Gazette,' Dec. 23; the 'Lancet,' Dec. 23; the 'Medical Press and Circular,' Dec. 27; 'Nature,' Dec. 23; the 'Chemical News,' Dec. 23; 'English Mechanic,' Dec. 22; 'Gardeners' Chronicle,' Dec. 23; the 'Grocer,' Dec. 23; the 'Journal of the Society of Arts,' Dec. 23; 'American Journal of Pharmacy' for December; the 'Canadian Pharmaceutical Journal' for December; 'Journal de Pharmacie et de Chimie' for November; the 'Chloralum Review' for December; 'Brewers' Guardian' for Dec. 6; the 'Leavenworth Medical Herald and Journal of Pharmacy' for December; the 'Druggists' Circular' for December.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

DIFFICULTIES IN DISPENSING.

Sir,—I had hoped to spend my time to-day more pleasantly, if not more profitably, than in reading and replying to the communications of your three correspondents; but, as this is pre-eminently the day of "peace and good will to man," I will accept their good will, and endeavour to forget anything that may have seemed to have an opposite tendency.

Mr. Clark objects that in my paper I did not "assert the principle that the prescriber should be communicated with where possible." I did not for the very obvious reason that the subject of my paper not being "mistakes in prescribing," but "difficulties in dispensing," that question was not within its scope; and also because I considered the principle to be so generally acknowledged, I really did not think any allusion to it necessary.

Next, with regard to the disputed question of an excessive quantity of essential oils in pills, I think there can be no doubt that they are frequently ordered at random, without the prescriber having the least idea that the quantity prescribed cannot be got in by fair means; and, being very often merely flavouring ingredients, it does not weigh very heavily on my conscience to leave out the excess, rather than to increase the bulk of the pill by the addition of tragacanth, or to alter its chemical constitution by the addition of magnesia; and I think we ought to be quite as mindful what we add as what we subtract. Let it, however, be clearly understood that I protest as strongly as any one against any omission of, or tampering with, any active or really important ingredient.

With regard to the more personal part of this controversy, if I have said anything to wound the feelings of any one, I am sorry to have done so. I never like to see personalities introduced into a discussion of this nature, but think that we ought always to try and give people credit for good intentions at least, and not too hastily condemn in strong terms what we do not altogether approve of, remembering there may be something we know not of that may give a totally different complexion to the matter. I believe we are all agreed that the intentions of the prescriber should be carried out as far as possible, though we may differ somewhat as to the mode of doing so.

W. WILKINSON.

Cheetham Hill, Dec. 25th, 1871.

SYRUP OF TOLU.

Sir,—Many of your readers may be glad to know of another use to which the waste resin of the syr. tolu process may be put. As Mr. Haselden has observed, the balsam of tolu is not exhausted by the boiling with water in such quantity as is directed by the Pharmacopœia, and I have used the residue for benzoating fats used in the preparation of pomades, etc., with very good results. Lard, etc., is thus preserved from rancidity, and the citrine perfumes are in great measure preserved from change; besides which, the odour of the balsam communicated to the pomade forms a good basis for the perfume.

24, *High Street, Strood,* J. KNOWLES.
December 14th, 1871.

P.S.—It communicates a slight greenish colour to colourless fat.

Sir,—A difference of opinion seems to exist as to the proper method of preparing this adjunct to "elegant pharmacy." Mr. Haselden states that if the liquid be filtered whilst hot, the syrup would contain resinous matter and cinnamic acid "which might induce, and has been known to do so, the very irritation or tickling about the fauces which it was intended to allay." It will occur to any practical chemist and druggist that the ordinary syrup of balsam (formerly Syr. Tolutani, Ph. Lond.) is made by adding about ℥j Tr. Tolu to 2 simple syrup, which remedy is much in request for the tickling cough of infancy; here is an undoubted combination of all the constituents of balsam of tolu; and it is hard to understand on the above quoted theory, how any good can result from its use, unless we adopt the motto, "Similia similibus." (See also United States Pharmacopœia.)

Again, aged people (some who have even reached their second childhood) believe very much in the efficacy of Friar's balsam, which, in addition to balsam of tolu, also contains benzoin and storax, both rich in the same principles.

It does not seem possible that a clear syrup could be made if resinous and insoluble matters are suspended in it; what we prepare is uniformly bright and limpid. The matter may seem in itself trifling, but it is scarcely worth while adding to the time required for making a preparation which occupies quite enough of that valuable article, let it be done ever so expeditiously.

R. Goodwin Mumbray.

Richmond, December 18th, 1871.

Professor Tyndall's Theory of the Blue Colour of the Sky.

Sir,—In answer to your correspondent Dr. Barnsley, of Barra Mansa, Rio de Janeiro, I would say that he appears to have allowed his ideas to be more or less confused by failing sufficiently to discriminate between the various modes of the conveyance of light known as "reflected," "transmitted" and "scattered" light, of which I am sure he will require no explanation at my hands.

Replying to his first question,—no sunbeam, under spectral analysis, has been found without the blue waves. In looking directly at the sun the impression of colour is yellow or reddish-yellow. The blue is also there; but so weakened in intensity as to be almost entirely overpowered in our perception by the other constituents of the solar rays.

In answer to the second question,—Dr. Barnsley takes the term "stopped" in a sense different to that which was intended by me. What I meant was, that the blue waves, on coming in contact with the particles, are not only stopped, but immediately scattered in all directions and reach our retinæ, therefore, at all angles, producing a blue impression.

Replying to Dr. Barnsley's third question,—I must refer him to my answer to his first two questions, depending as it does on the meaning I intended to convey by the word "stopped."

Dr. Barnsley's remark, "that on the highest mountains the sky is of an inky hue," is borne out by several authorities, among them Mr. T. G. Bonney, who ascended Monte Rosa, 15,217 feet above the sea-level, and who states that "the colour was so deep as almost to approach black. This intensity of colour was only very conspicuous during the last few hundred feet of the ascent."

Mr. Hincliff, in his 'Summer Months among the Alps,' corroborates this statement of Mr. Bonney. These facts, I think, strengthen the theory of Professor Tyndall. The atmosphere at such heights is more rarified, and, therefore, more free from large particles than it would be nearer the earth. It is these large particles which diminish the intensity of the blue impression on our vision, by scattering more of the larger waves (namely, the red and yellow) into space, in addition to the blue ones.

In answer to your correspondent's fifth question,—it cannot be proved, experimentally, that "our atmosphere is filled with countless millions of excessively minute particles;" but Professor Tyndall does not go further than to point out that all "the phenomena certainly occur, as if our atmosphere were a medium, rendered slightly turbid by the mechanical suspension of exceedingly small foreign particles," and that they would not be satisfactorily accounted for on any other supposition but this. Again, by producing, artificially, a similar condition of matter supposed by this theory, we get the same results as we offer to explain, which, to my mind, is almost conclusive proof of its probable correctness.

With regard to my experiment, Dr. Barnsley's supposition of the position of my apparatus is directly contrary to the facts. My magnesium lamp was placed at the side of the glass vessel containing the suspended particles of gum, and the light from the latter, seen by myself and my audience, was entirely reflected, and we therefore saw blue. Had the vessel been, as Dr. Barnsley remarks, "between the light and the retina," his view would be quite correct, as the colour produced in this position was, as Dr. Barnsley states, "a compound of the prismatic colours, minus the blue."

Apologizing for the delay in replying, I have the honour to remain,

Albert Henry Samuel.

145, *Upper Parliament Street, Liverpool, December 4th,* 1871.

Early Closing.

Sir,—Seeing that almost every trade, with the exception of the druggists, are making endeavours to shorten their business hours, I think it is time we took it to heart and tried if we cannot get our long period of daily labour shortened, and thus afford both to employers and employed a chance of enjoyment and recreation. No wonder we poor druggists, as a majority, look pale and wan, when we are behind a counter or in a stinking warehouse or laboratory from 7.30 A.M. to 10 P.M.

This is the way to ruin a man's health. How can an apprentice be expected to study after ten at night? He wants to go to bed then, independent of never having any out-door recreation. "All work and no play makes a dull boy." So let us take more recreation, and we shall be able to work all the harder and better at the proper time.

I hope some one may take the matter up as well as myself, as I dare say many others are so situated.

W. S. Stables.

The Preliminary Examination.

Sir,—I have read several letters lately respecting the mode of conducting the Preliminary examination, and from the fact that it is merely an educational test, consider that it would give far more satisfaction to the trade at large, as well as the candidates, if it were conducted by the College of Preceptors; they have, I believe, conducted the Preliminary at the College of Surgeons for some time.

W. P. D.

November 21st, 1871.

"A Country Chemist."—You will find your query answered on p. 531.

W. Bates.—Locock's Lotion for the Hair:—Oil of Mace, ½ oz.; Olive Oil, 2 dr.; Water of Ammonia, ½ dr.; Spirit of Rosemary, 1 oz.; Rose Water, 2½ oz. Mix.

T. Bradley.—We believe the book is out of print, but second-hand copies may sometimes be obtained. The last edition was published in 1849.

F. J. Hayes.—Apply to the Registrar at 17, Bloomsbury Square.

J. Bienvenu.—The work referred to is not in the Society's Library. We will try and obtain the information.

"Pax."—The subject has been repeatedly discussed in this Journal. You will find papers in Second Series, Vol. XI. pp. 35, 453, 542.

B. M. Johnson.—The Act states that the duty shall be charged on the packet containing the powders; it has, therefore, in some cases been considered that a person who has a licence to sell patent medicines may open a packet of powders and sell them separately, but this practice seems to be very much like an evasion of the Act, which states that the stamp duty is to be paid "For and upon every packet, box, bottle, pot, phial *or other inclosure containing any drugs, herbs, pills, waters, essences, tinctures, powders, or other preparations or compositions whatsoever,* used or applied, or to be used or applied, externally or internally as medicines or medicaments, for the prevention, cure or relief of any disorder or complaint incident to, or in anywise affecting the human body, which shall be uttered or vended in Great Britain."

J. M'Knight.—Your communication has been handed to the publishers, to whom it should have been sent.

Communications, Letters, etc., have been received from Mr. J. Bradshaw, Mr. A. W. Bennett, Mr. Yewdale, Mr. J. Mackay, Messrs. Jones, Palmer and Co., "Écosse," T. A.

TWO MEDICINAL BARKS FROM CEYLON.

BY M. C. COOKE, M.A.

Samadera Bark, *Samadera indica*, Gærtn. Having received specimens of this drug through the kindness of M. P. J. Ondaatje, Esq., of Ceylon, now resident in London, we proceed to give a few particulars of what will doubtless prove to be a very valuable addition to the list of Oriental materia medica. The drug consists of a thin fibrous inner bark, almost of a primrose yellow, and not thicker than stout cartridge paper. It is in irregular fragments, from two or three to seven or eight inches in length, and from half an inch to upwards of an inch in breadth, fibrous when broken, and though readily splitting in a longitudinal direction, is tough transversely. When masticated it has an intense, though by no means unpleasant, bitter taste,—not unlike that of quassia, but more intensified; in fact, its intensity seemed to us greater than that of any drug of its kind with which we are acquainted. One is led to inquire, how it is that a substance which appeals so immediately to the senses should for so long have been comparatively unknown. Of course, we have had no opportunity of practically testing its merits, but its own recommendation is so strong, combined with the fact that the tree which yields it belongs to the Natural Order *Simarubaceæ*, in common with *Simaruba* and *Quassia*, that we are disposed to regard it as fully equal to the best of either, and it may be superior when subjected to a fair trial.

The following is a brief description of the tree which yields the Samadera bark:—

A tree of from thirty to thirty-five feet in height. Leaves alternate, oblong elliptical, very long; calycine segments 4–5 each, marked with an external gland; petals 5, longer than the calyx; flower-bearing peduncles longer than the leaves, pendulous, compressed axillary or terminal, divided at the apex into a small umbel; drupe with a thick pericarp, somewhat angled; flowers white (Wight's *Illustrations*, plate 68). Ceylon, Cochin and Malabar; flowering in the hot season. It grows abundantly in Travancore, and is easily propagated from seeds. Drury says of it, that the bark has febrifugal properties, and is used by the natives of India for this purpose. An oil is extracted from the kernels of the fruit, which is extensively used in rheumatism on the West Coast, and is procurable in the bazaars. In erysipelas the leaves bruised are applied externally. Their juice boiled up with oil is given as a liniment in psydracia.

The tree is known in South-western India by the name of "Karinghota," and in Ceylon as "Samadera-gass."* In Thwaites' 'Ceylon Plants' it is stated that "the root of this plant is used as a medicine by the Cinghalese, and so also is the fruit;" but nothing is mentioned about the intense bitterness of the inner bark, or its medicinal uses. If it is really plentiful in Southern India and Ceylon, trials should be made of the bark, both in those places and here, since a substance of so much promise should not be neglected for want of the necessary experiments. Because so many Eastern drugs have proved to be comparatively worthless, there is no reason why others may not prove exceedingly valuable.

Kokoon Bark, *Kokoona zeylanica*, Thw. Mr. Ondaatje has also favoured us with this product, and informs us that the inner yellow bark of the kokoon-tree of Ceylon is employed as a febrifuge and sternutatory, and as a dye. In Thwaites' 'Ceylon Plants' it is stated that "the inner yellow bark of this tree is employed by the natives medicinally as a sternutatory, and an oil is expressed from the seeds, which is used for burning in lamps" (p. 52).

The tree belongs to the Natural Order *Hippocrateaceæ*, and the species is described by Thwaites in Hooker's 'Journal of Botany,' vol. v. (1853) p. 379, accompanied by a plate.

It is a large forest tree, sixty feet or upwards in height, much branched, especially towards the top. Bark rough, when cut of a yellow colour, somewhat corky. Leaves dark green, smooth, underneath paler, with very numerous minute, dark red, glandular dots. Stipules very minute, deep red, subpersistent. Panicles axillary, raceme-like. Bracts very minute, acute. Flowers dull yellowish-brown. Calyx minute, with five shallow lobes, persistent. Petals five, concave, firm in texture with minute pale glandular dots on the inner surface, twisted in æstivation. Stamens five, alternate with the petals, inserted into depressions of the dark green angular disc. Ovary three-celled, each cell with four ascending anatropal ovules. Style short. Stigma capitate, somewhat three-lobed. Capsule 1–4 inches long, oblong bluntly triangular, three-valved, three-celled. Seeds imbricated, winged, erect, exalbuminous. Wing very broad, oblong, truncate or blunt. Embryo orthotropal; cotyledons flat.—Hook. Journ. 1853, p. 380, pl. 6.

Not uncommon on the banks of streams in the Suffragam and Ambagamowa districts, at an elevation of 2000 to 4000 feet. Native name "kokoon-gass."

The yellow bark is sold in the bazaars, and when pounded is used by the Cinghalese as a kind of cephalic snuff, being mixed with ghee and introduced into the nostrils, in order to relieve severe headache, by encouraging a copious secretion from the nose. (Thwaites.)

The bazaar drug consists of small fragments of the bark, the largest not exceeding an inch in length, but the majority not more than a quarter of an inch; of a bright ochraceous or dull orange colour when broken, very friable, and easily reduced to powder, which plentifully accompanies the bark, as also do portions of the capsules. There is scarcely any perceptible odour or taste. In the fragments of bark from young branches there is at length a slight bitterness after mastication. The value of the drug as a febrifuge appears to be very doubtful, and we have no information as to the success attending its employment by Mr. Ondaatje himself.

* *Gass*, in the Cinghalese language, signifies *tree*.

PURE BROMIDE OF POTASSIUM.*

BY M. FALIÈRES.

The employment of bromide of potassium in affections of the nervous system has become so general during the last few years as to create for it a considerable demand. This has resulted in much competition among those engaged in the manufacture and

* From a Report made by MM. Poggiale and Gobley to the Academy of Medicine upon a Memoir by M. Falières, entitled "Monographie Chimique et Pharmaceutique du Bromure de Potassium" (Journ. Pharm. [4] xiv. 247).

the accompaniment of frauds, so frequently encountered in connection with high-priced products. It is important, therefore, that pharmaceutists should be acquainted with the means of exposing these falsifications, so that they may be able to supply to their customers a pure bromide of potassium; and to this part of the subject M. Falières devotes the first part of his monograph.

Among the salts that have been detected in commercial bromide of potassium are iodide of potassium, chloride of potassium, potash in a free and carbonated state, sulphate of potash, nitrate of soda and bromate of potash. Considering its high price, it is not probable that iodide of potassium is fraudulently introduced into the bromide; but its presence is probably due to the fact, that the bromine of commerce usually contains traces of iodine. Small quantities of iodine may be detected by treating a solution of the bromide of potassium with chlorine water or bromine water. The iodine which is set free gives a blue colour with the mucilage of starch, and rose or amethyst violet with benzine, chloroform or sulphide of carbon. But M. Falières gives the preference to a process employed by M. Bouis to detect iodine in mineral waters. It consists in introducing some solution of the bromide of potassium under examination into a small closed tube, then adding a few drops of solution of perchloride of iron and boiling the mixture. The perchloride of iron is without action upon the bromide of potassium, while it completely precipitates the iodine from the iodide. Consequently, if a piece of starched paper be introduced into the tube, the blue tint of iodide of starch appears if the solution contains only traces of iodine; but it is a better plan to distil a small quantity of the solution and seek for the iodine in the distillate. M. Falières proposes to make this method more practical still, by simply dipping a small slip of ordinary white paper into the solution containing the bromide of potassium and perchloride of iron, when, if the liquor contains iodine, the paper will become blue.

M. Falières has noticed in bromide of potassium the presence of quantities, often considerable, of chloride of potassium. M. Adrian, also, has ascertained that of ten specimens obtained from the principal manufactories for the supply of pharmacy, one only was suitable for employment in medicine. In the other nine he found variable quantities of the chloride, amounting sometimes to 30 per cent. of the entire weight. He has remarked besides, that one of the most beautiful specimens, judging by the regularity of the crystals, was also one of the most impure. This fraud is a very grave one, as it cannot be doubted that it interferes seriously with the therapeutical action of the bromide, and it is important, therefore, that pharmaceutists should be able to determine in a precise manner the proportion of the chloride; but the estimation is one that presents great difficulties.

It is well known that chlorine, bromine and iodine, and their compounds, present such close analogies that no good process has yet been discovered for their separation. Of chlorine and bromine particularly, the solubility and insolubility of the combinations which they form are so nearly alike that it is very difficult to accomplish their separation by means of an insoluble precipitate. The application of the numerous gravimetric methods presents so many difficulties, that the analysis of a mixture of chlorine and bromine, and even of iodine, is doubtless one of the most delicate of operations, requiring great skill in the manipulation.

In 1868, M. Baudrimont published* what he termed the "indirect process" for the detection of the presence of chloride in commercial bromide of potassium. It was based upon a fact well known to chemists, that a given weight of chloride of potassium decomposes a much larger proportion of a titrated solution of nitrate of silver than the same weight of bromide of potassium. For instance, 1 gram of the bromide requires for its complete precipitation as bromide of silver only 1·427 gram of the nitrate of silver, whilst it requires 2·279 grams of the same nitrate to entirely convert one gram of chloride of potassium into chloride of silver.

In February, 1869, M. Falières communicated to the Société de Pharmacie at Bordeaux a process of volumetric analysis for a mixture of chloride and bromide of potassium by means of a titrated solution of nitrate of silver,—an idea which he then thought to be entirely new, but for which he afterwards yielded the palm of priority to M. Baudrimont. But the process of M. Falières constitutes a considerable advance, and will be very useful in ascertaining the degree of purity of bromide of potassium. Taking advantage of the recognized fact that the before-mentioned proportions of nitrate of silver are required for the conversion of bromide and chloride of potassium into bromide and chloride of silver respectively, M. Falières points out that in a mixture of ·9 of bromide and ·1 of chloride, the quantity of nitrate of silver requisite for their complete conversion would be—

$$1{\cdot}427 \times 0{\cdot}9 + 2{\cdot}279 \times 0{\cdot}1 = 1{\cdot}5122.$$

Consequently, if the bromide contains 10 per cent. of chloride, it would be necessary, after having treated the mixture with 1·427 of the nitrate of silver, still to add 0·0852 of the same reagent. It is evident, therefore, says M. Falières, that if ·852 of nitrate of silver be dissolved in 100 cubic centimetres of distilled water, and after having treated 1·0 of bromide of potassium with 1·427 of silver, it still requires for complete precipitation 5, 10, 20 or 30 cubic centimetres of the titrated solution, it is because the bromide of potassium under analysis contains 5, 10, 20 or 30 per cent. of chloride.

The details of the process, as given by M. Falières, are as follows:—First, it is necessary to ensure—by means of perchloride of iron, salts of baryta and strong sulphuric acid in excess—that there are no other salts present, such as iodide of potassium, carbonate and sulphate of potash, or nitrate of soda, which would disturb the results of the analysis. Then dissolve, in a stoppered bottle, 1 gram of the bromide of potassium in 30 or 40 grams of water, and add a solution containing 1·427 gram of nitrate of silver. When the precipitate has settled to the bottom of the bottle, add the bromometric liquor drop by drop by means of a Gay-Lussac burette. If the bromide be pure, the addition of a drop of this liquid will cause no turbidity; if, on the contrary, a precipitate is formed, the volume of the test liquor employed will show the quantity of chloride present. This operation is reported to be easily performed, and to yield good results.

* *Journal de Pharmacie et de Chimie*, vii. 411.

M. Falières next indicates the proper method for ascertaining the presence of potash, carbonate of potash, bromate of potash, sulphate of potash and nitrate of soda.

Upon a small piece of iodine being thrown into a solution of bromide of potassium the liquor will assume a yellow tinge if the bromide be neutral, but it will remain uncoloured if it contain potash or carbonate of potash. The latter salt may be detected by means of lime or salts of baryta; the precipitate is soluble with effervescence in acids. The presence of bromate of potash may be detected by heating some of the solution with colourless hydrochloric acid. The solution takes a yellow tinge if it contains bromate of potash, but remains colourless if the bromide be pure.

M. Falières states that he has found nitrate of soda in many specimens of bromide of potassium of English manufacture. This fraud occupied his particular attention in consequence of the difficulty of its detection. As nitrate of silver exercises no action upon nitrate of soda, its presence might be unsuspected unless it were specially sought for. When a mixture of bromide of potassium and nitrate of soda is treated with strong sulphuric acid in excess, hydrobromic acid and ruddy vapours of bromine and hyponitric acid are formed. If the bromide of potassium be pure, white vapour of hydrobromic acid is abundantly disengaged, and a small quantity of reddish-yellow vapour of bromine. M. Falières thinks that these reactions would be sufficiently distinct; but the gentlemen who reported on the memoir to the Academy consider that when the quantity of nitrate of soda is small, the result would not be clear. They recommend that in that case the nitric acid should be estimated by one of the known volumetric methods, and the bromine by a titrated solution of nitrate of silver.

The second part of the memoir is devoted to discussion of the best mode of preparing pure bromide of potassium. If the ordinary manufacturing process of preparing bromine from the mother liquors of soda is considered, together with the composition of caustic potash, it will be seen how easily the bromide of potassium prepared from them may become contaminated by the salts already noticed. M. Falières therefore turned his attention to discovering a means of obtaining bromine and potash completely pure for the purpose. The elimination of iodine from bromide of potassium may be easily accomplished by the process of M. Baudrimont, which consists in boiling the iodized bromide with an excess of bromine water, when the iodine that is driven off by ebullition is replaced by the bromine. The liquor is afterwards evaporated to dryness, to drive off excess of bromine.

The process recommended for the purification of bromine is based upon the following reaction. If a solution of bromide of potassium be poured into a saturated aqueous solution of chloride of bromine, the mixture becomes turbid, and pure bromine is thrown down; and if the mixture be heated to drive off excess of bromine and of chlorine, the supernatant liquor will contain only chloride of potassium, the bromine of the chloride of bromine and the alkaline bromide being set free and deposited. Consequently, if commercial bromine be treated with a slight excess of bromide of potassium, the bromine will be deprived of any chlorine it may contain. Such salts as nitrates, bromates, sulphates and chlorides will remain in solution; but any iodine that may be present will be precipitated with the bromine; from which it may be easily purified by the process before mentioned.

Potash alcohol being too expensive, and caustic potash always containing foreign matters, M. Falières proposes to employ purified bicarbonate of potash in the preparation of bromide of potassium. 100 grams of the bicarbonate are dissolved in 500 grams of distilled water, to which is added 80 grams of pure bromine. When the disengagement of carbonic acid has ceased, a solution, composed of 90 parts of water and 30 parts of ammonia, sp. gr. ·875, is poured in. It is then evaporated to dryness, and the residue heated until white ammoniacal vapours are no longer given off. The salt is then fused, in order to convert the bromate into bromide. The product is redissolved in bromine water, evaporated and set aside to crystallize. It is important to notice that in this process the bromide of ammonium reacts upon the undecomposed carbonate of potash and converts it into carbonate of ammonia, which is volatilized. The bromate so obtained does not appear to contain the least trace of carbonate.

M. Castelhaz, who has proposed to replace in medical practice the bromide of potassium by that of sodium, prepares the latter by an analogous process, treating the bromide of ammonium by an equivalent quantity of pure soda or carbonate of soda. He obtains the pure bromide of ammonium by letting bromine fall drop by drop into ammonia diluted by distilled water, and conducting the operation in a Woulfe's apparatus, in order to avoid loss. The evaporation is accomplished in an iron retort, and the disengaged vapours collected in a stone-ware receiver. The decomposition of the bromide of ammonium by the carbonate of soda is also carried on in an iron retort communicating with two large vessels for the condensation of the vapours.

TRANSFORMATION OF A SOLUTION OF CANE-SUGAR INTO GLUCOSE UNDER THE INFLUENCE OF LIGHT.

BY M. E. M. RAOULT.

The author, in a short note presented to the Académie des Sciences,* says that the idea that a solution of cane-sugar, kept at the ordinary temperature, and protected from the action of ferments, will preserve indefinitely its flavour and chemical properties, is an error. He states that he has often observed such a solution, without undergoing the least fermentation, to become altered, and at length transformed, more or less completely, into glucose; and during the present year he has made the following experiment, which shows that this change takes place under the influence of light:—

On the 12th of May, 10 grams of white sugar were dissolved in 50 grams of pure water. Equal volumes of this solution being introduced into two tubes of white glass were boiled for some minutes, and the tubes closed at a flame before the re-entry of air. The tubes so prepared were placed, one in complete darkness, the other in a good light; but, at the same time, they were kept side by side, that they might be subjected to the same variations of tempe-

* Comptes Rendus, vol. lxxiii. p. 1049.

rature. Five months afterwards, the 20th of October, the tubes were opened. The solutions were perfectly transparent, and contained no microscopic vegetation. That which had been kept in darkness gave no reaction with the cupro-potassic test of M. Barreswil, thus showing that it contained no glucose. When that reagent, however, was added to the solution which had been exposed to the light, it caused an abundant red precipitate. About half the cane-sugar at first contained in the solution was found to have changed; so that under the influence of light, cane-sugar dissolved in water changes slowly into glucose.

It results from this that a syrup might contain a considerable quantity of glucose, although cane-sugar only had been used in its manufacture, and that such an occurrence is not necessarily evidence of an adulteration.

At a subsequent sitting of the Academy,* a note was read relative to this subject, from M. Maumené, in which that gentleman stated that he had many years since indicated the possibility of the slow transformation of cane-sugar into glucose without the intervention of a ferment.

* Comptes Rendus, vol. lxxiii. p. 1176.

Chapters for Students.

CHEMICAL NOTES TO THE PHARMACOPŒIA.

BY WILLIAM A. TILDEN, D.SC. LOND.

DEMONSTRATOR OF PRACTICAL CHEMISTRY TO THE PHARMACEUTICAL SOCIETY.

Potassæ Nitras, KNO_3.—Exists ready-formed in the juices of many plants, and sometimes appears as an efflorescence upon the surface of extracts. It is also a common constituent of well and river waters. It is, however, always obtained from the earth, being found in various districts in the East Indies as a saline crust or deposit upon or near the surface of the soil. It is simply dissolved out, and, to purify it, is recrystallized several times. It is also made artificially by exposing a damp mixture of nitrogenous organic refuse and lime or wood ashes to the air.

[§ In white crystalline masses or fragments of striated six-sided prisms.] It is anhydrous, and therefore unlike sulphate of sodium; for example, it does not effloresce. [§ Thrown on the fire it deflagrates; warmed in a test-tube with sulphuric acid and copper-wire, it evolves ruddy fumes.] It should be free from chloride and sulphate.

Fused and moulded, it forms sal-prunella. Heated more strongly it loses a portion of its oxygen, leaving, if it be stopped at the right point, potassic nitrite, KNO_2, or ultimately a mixture of the oxides of potassium K_2O and K_2O_2. In the fused state it is often employed as an agent of oxidation, as, for example, in making arseniate of sodium.

Potassæ Permanganas, $K_2Mn_2O_8$.—Is always produced by the decomposition of the manganate, K_2MnO_4.

The manganate of sodium is made on the large scale by exposing to a dull red heat for many hours a mixture of caustic soda and peroxide of manganese: oxygen is absorbed from the air.

$$2NaHO + MnO_2 + O = Na_2MnO_4 + H_2O.$$

According to the Pharmacopœia, which adopts the usual method, a mixture of caustic potash and manganese oxide acquires the necessary oxygen by fusion with chlorate of potassium.

$$3(2KHO + MnO_2) + KClO_3 = 3(K_2MnO_4 + H_2O) + KCl.$$

The heat must be carefully applied, or the product will be decomposed. A scarcely visible heat for about twenty minutes is sufficient for a small quantity. The green mass, boiled in water, yields a green solution, which is strongly alkaline. This is mixed with dilute sulphuric acid till the colour changes to bright purple, is evaporated quickly, decanted from the deposited peroxide of manganese, and set to crystallize. Chlorine or carbonic acid gas passed into the solution is better than sulphuric acid for the transformation of manganate into permanganate. In either case the change is simply due to the abstraction of half the potassium, but when the acid is employed, one-third of the manganese is precipitated as peroxide.

$$\underbrace{3K_2MnO_4}_{\text{Manganate.}} + 2H_2SO_4$$

$$\text{Or } 2K_2MnO_4 + K_2O\,.\,MnO_2\,.\,O + 2H_2SO_4$$
$$= \underbrace{K_2Mn_2O_8}_{\text{Permanganate.}} + \underbrace{MnO_2}_{\text{Peroxide of Manganese.}} + \underbrace{2K_2SO_4}_{\text{Sulphate of Potassium.}} + \underbrace{2H_2O.}_{\text{Water.}}$$

When chlorine is employed—

$$\underbrace{2K_2MnO_4}_{\text{Manganate.}} + Cl_2 = \underbrace{K_2Mn_2O_8}_{\text{Permanganate.}} + 2KCl.$$

The solutions cannot be filtered.

The salt is easily recognized when in the solid form by the purplish semi-metallic lustre of the crystals, and by the intensely purple solution which they yield.

It must not be forgotten that the salt is decomposed, and its colour destroyed, with formation of a brown deposit of peroxide of manganese, by organic matters of every kind. Tinctures, infusions and vegetable preparations are therefore incompatible with it, as are also such things as glycerine, sulphate of iron, sulphurous acid, essential oils, and many others.

CHROMIC ACID AS AN ANTISEPTIC, DISINFECTANT, ETC.,

More Especially as Compared with Carbolic Acid.*

BY JOHN DOUGALL, M.D. GLAS.

Chromic acid occurs in brilliant crimson needles, which deliquesce by exposure to the air. When pure it is almost odourless. Its aqueous solution has a sour metallic taste, and a rich amber or reddish-brown colour. It is very soluble in water, sparingly soluble in chloroform, insoluble in the fixed oils and fats. Contact with carbolic acid, mucilage, glycerine, alcohol, ether, and with organic matter generally, instantly decomposes it with more or less violence, oxygen being evolved and heat generated.

Antiseptic properties.—As an antiseptic, disinfectant, and preventive of germ growth, chromic acid stands "second to none." Several varied experiments were made in order to ascertain its antiseptic powers in contrast with those of carbolic acid. One detailed may suffice, all the others confirming it. One ounce of ox muscle was immersed for twenty-four hours in four ounces of an aqueous solution of chromic acid (1–2000), then suspended in air. In two days it was quite black, and in six days as hard as wood, in which condition it

* Reprinted from the *Lancet*, vol. ii. (1871) p. 847.

still remains (three months after), without mould or taint. One ounce of ox muscle was immersed for twenty-hours in four ounces of an aqueous solution of carbolic acid (1–1000), then suspended in air. In six days it was much hardened, brownish-black, speckled with mould, and distinctly tainted.

It appears that chromic acid acts as an antiseptic by coagulating protean compounds, a property which it possesses in the highest degree, and to which I am not aware that attention has been hitherto directed, although used for a considerable time in hardening animal tissues for microscopical examination. The coagulating power of chromic acid in albuminous solutions has been compared with that of most metallic salts, various acids, etc., and found to exceed them all: *e. g.* it has about ten times the coagulating power of carbolic acid, fifteen times that of nitric acid, twenty times that of bichloride of mercury, and a hundred and fifty times that of chlor-alum, etc. Shortly after a piece of muscle is immersed in a solution of chromic acid, there forms in considerable quantity a greyish, opaque, granular sediment, coagulated albumen; while the deep red of the muscle is changed to brownish-yellow, ultimately it looks as if it had been boiled, the residual portion of muscle being composed almost exclusively of fibrous stroma, and becoming, on drying, extremely hard and tough. A portion of muscle immersed in a solution of carbolic acid retains a light pinkish, somewhat blanched aspect; while the solution, remaining void of sediment, is reddish and hazy, but translucent. If to a portion of this fluid there be added a little chromic acid solution, not stronger than 1-1000, a voluminous precipitate of albumen is at once obtained, clearly demonstrating the superior coagulating power of chromic acid over that of carbolic acid.

A solution of two grains per ounce at once indicates the presence of albumen in a solution consisting of one part of a saturated solution of beef juice in twenty of water; while one of beef juice in thirty of water may be detected by allowing the mixture to stand for twelve hours. Chromic acid is admirably adapted for determining volumetrically the percentage of albumen in a fluid. An albumenometer may be constructed as follows: Fill a wide-mouthed burette to a multiple of 100 with albuminous urine or an albuminous fluid; add solution of chromic acid, about four grains per ounce, in slight excess; shake the mixture; set aside for twenty-four hours; read off the precipitate, and multiply to per cent. No heating is required. Chromic acid also coagulates mucus, saliva, chondrin, and gelatine. With the latter two it forms, in excess, canary-yellow fluids and flocculent precipitates coloured like chromate of lead. The reaction with gelatine is as delicate as that with tannin, giving a response with 1 to 5000. Chromic acid is therefore a test for gelatine. An aqueous solution of carbolic acid (1 to 20) produces only slight haziness in gelatinous solutions.

Disinfecting properties. — Chromic acid coagulates, hardens, and oxidizes decomposing organic matter. It combines simultaneously with ammoniacal products and with nascent sulphuretted hydrogen, reducing the latter to water and free sulphur ($2CrO_3 \times 3H_2S = Cr_2O_3 \times 3H_2O + 3S$). Added to putrid blood, flesh, pus, urine, or fæcal matter, the offensive odour is soon absolutely removed, the mixture remaining fresh for an indefinite time. Dr. R. A. Smith found that bichromate of potassium surpassed thirteen other of the most energetic antiseptics, including carbolic acid, in preventing the evolution of sulphuretted hydrogen in a mixture of equal parts of blood and water.* This salt has a coagulating power near that of nitric acid; *i. e.* fifteen times weaker than that of chromie acid. Hoppe Seyler has shown that, "while in disinfection it is highly necessary to destroy the products of fermentation and putrefaction, yet the destruction of sulphuretted hydrogen and ammonia can have no more influence on the fermentative changes involved in cholera and typhus than the removal of carbonic acid can have upon the progress of alcoholic fermentation; and therefore the ferment itself must be attacked, which, as pointed out, is more resistent than the living organisms in decomposing solutions."* Now chromic acid, as already shown, fulfils admirably these requirements. Carbolic acid does not combine with ammonia, nor decompose sulphuretted hydrogen. This is surely of importance in a sanitary sense, when it is remembered that almost to these properties alone are due the marked disinfecting powers of sulphurous acid, nitrous acid, permanganate of potassium, bisulphite of lime, protosulphate of iron, chloride of zinc, chloride of aluminium, chlorine, bromine, iodine, etc. Carbolic acid seems to act as an antiseptic solely by coagulating albumen. It does not preserve by absorbing and retaining moisture, like chloride of sodium, alcohol, etc., as, practically, it has no affinity for water. Chromic acid is the reverse.

In Dr. A. E. Sansom's book, page 28,† the following passage occurs:—"It has been shown, however, that carbolic acid has the faculty of coagulating albumen. Is it on account of this faculty that it prevents fermentation and putrefaction? On this point a comparative experiment throws some light. Let a solution of the albumen of egg be precipitated, in one case by heat or by an ordinary chemical reagent, and in the other by a solution of carbolic acid, and let the resultant precipitate be kept a considerable time in contact with the air. It will be observed that whereas in the one case the albumen will become decomposed in the ordinary manner, that precipitated by the carbolic acid entirely resists putrefactive change. It is therefore obvious that carbolic acid has an action over and above its action as a mere precipitant of albumen." The fact is here ignored that in general chemical precipitates of albumen are soluble in water, specially carbolico-albuminoid precipitates; and as the latter cannot exist without the presence of carbolic acid, the difference between the "carbolic" and "heat" precipitates is simply that the one contains an antiseptic, while the other does not. As regards the other precipitates, the alleged results only show that carbolic acid is a more powerful antiseptic than any of the ordinary chemical reagents referred to. Furthermore, it may be urged that carbolic acid is volatile, whereas chromic acid is fixed; therefore the former can arrest putrefaction by coagulating floating particles of organic débris. But in a series of experiments by Dr. R. A. Smith,‡ "to determine the efficiency of strong gases and volatile substances in preventing putrefaction," it is shown that pieces of fresh meat suspended in bottles containing chlorine, bromine, iodine, hydrochloric acid, ammonia, protoxide of nitrogen, nitrous acid, and sulphurous acid, were fresh at the end of twenty-eight days; while a piece suspended in a bottle containing heavy oil of tar, and a piece in a bottle containing M'Dougall's powder, of which the chief ingredient is crude carbolic acid, grew slimy and putrid in seven days. I have also made the following experiment:—A piece of ox muscle, a portion of beef juice, of urine, and of infusion of hay, the three latter in separate phials, were suspended in a gallon bottle, which contained fully a pound of pure carbolic acid, about six inches from its surface. The bottle was kept open at about 60° F. On the fourth day the beef juice was putrid and swarming with bacteria, vibriones, etc. A portion of the same juice exposed to the air was not more putrid on the fourth day than that in the bottle. On the fifth day both the urine and infusion of hay teemed with life; while on the surface of the latter there was an abundant development of penicillium. On the sixth day the piece of muscle was putrid and slimy.

* 'Disinfectants and Disinfection,' pp. 89, 91.

* The *Lancet*, Aug. 26th, 1871.

† The 'Antiseptic System'. By A. E. Sansom, M.D. Lond.

‡ 'Disinfectants and Disinfection,' p. 109.

These facts prove that the vapour of carbolic acid, even when most concentrated, fails to arrest putrefaction, and to prevent the appearance of germs; indeed, as seen with the beef juice, it does not even delay those phenomena, the portion suspended in the carbolized atmosphere putrefying as quickly as that kept in ordinary air. "Here is a beautiful hypothesis slain by an ugly fact." After these results it is impossible to conceive, as it would be absurd to expect, the infinitely minute quantity of carbolic vapour which can be tolerated in the wards of a hospital, or is capable of diffusing spontaneously in an alleged infected medium, competent to destroy floating unseen germs and organic particles, seeing that in the highest state of concentration, and all the conditions in its favour, it failed to affect visible germs and tangible organic particles.*

(*To be continued.*)

THE ODOURS OF PLANTS.†

BY JAMES BRITTEN.

The subject of the phenomena of odour and colour in plants, and of the causes which induce or govern them, is one of considerable interest; and the relations which exist between the two are sufficiently striking. Thus, it has been statistically ascertained, and a very little reflection will confirm the conclusion, that white flowers stand highest in number among fragrant species, next yellow, then red, and lastly, blue. And it is among white flowers that disagreeable odours are most seldom found, while orange and brown are frequently unpleasant in scent. In such calculations, however, it must be remembered that the appreciation of odours is by no means the same to different people: scents which are agreeable to one, are often the reverse to another. The strong odour of *Tagetes patula* and *T. erecta* is not objectionable to some; while others, besides the well-known fox-hunter, are of opinion that the Sweet Violet is a "stinking flower." There are even some unhappy beings—we trust they are but few—who cannot endure the scent of a rose. The sense of smell, too, is much more acute in some persons than in others; and we have frequently remarked an analogy to colour-blindness in the want of perception of odours manifested by some among our friends.

A good summary and comparison of scents will be found in M. Lecoq's 'Études sur la Géographie Botanique de l'Europe,' from which some of the following details are borrowed. In almost every case, however, additional instances of similarity will suggest themselves to the reader, especially if he be gifted with a keen nose, and a good memory for smells. In the first place, it may be laid down as a general principle, that a larger proportion of white flowers are fragrant than those of any other colour; yellow come next, then red, and lastly blue; after which, and in the same order, may be reckoned violet, green, orange, brown, and black.

Among white flowers, certain types of scent are very prevalent. Thus many Umbelliferous plants have a strong odour of honey, which is very marked in *Anthriscus sylvestris*, and is found also in the aquatic ranunculi: *Eucalyptus glandulosa* recalls the same scent; and in the almond and apricot we encounter it, qualified by that flavour of prussic acid which is so perceptible in the hawthorn when one does not inhale too closely the fragrance of its flowers. This scent is intensified in *Spiræa Ulmaria;* in *S. Filipendula* it is modified by a *soupçon* of the odour which is found also in the privet and in *Actæa spicata*, and attains distinctness in the elder. Many Rubiaceous shrubs have similar odours, and resemble certain *Apocyneæ;* and the *Philadelphus coronarius* has so much affinity in scent with the orange, that it is often called the "mock orange bloom." Other types of scent among white flowers are presented by the white lily, the jasmine, the tuberose, and the lily-of-the-valley. It is curious to observe, that among cultivated plants, white-flowered varieties are very often the most—if not the only—fragrant ones; this is the case with the white petunia [?] and a commonly cultivated white-flowered verbena [?]. It is also worthy of notice that many of the scents among white flowers are only pleasant when in very small quantity, and become absolutely disagreeable when intensified; this is the case, especially, with the hawthorn and white lily.

Among yellow flowers, the scent of the orange is often found, we may note, in the common broom, and in *Biscutella saxatilis* and other yellow Crucifers. The curious alcoholic odour which has earned for *Nuphar lutea* its English name of "Brandy-bottle" is found also in the yellow *Brugmansia floribunda*, as well as in the yellow catkins of *Salix caprea*. *Hippocrepis comosa* recalls the smell of cheese, and this odour attains its maximum in the blossoms of *Genista Scorpius*. The honey scent is found in several yellow-blossomed plants, notably in *Galium verum* and *Mahonia intermedia*.

Roses and pinks occur to one at once, when sweet-scented red-flowered plants are referred to; but with these exceptions it is difficult to characterize the odours of plants belonging to this series. But among lilac flowers a great resemblance in scent may be traced; thus the sweet odour of vanilla, which is so powerful in the garden heliotrope, is found again in different degrees of intensity in *Petasites fragrans*, *Valeriana officinalis*, and the common lilac; we meet with it also in *Plantago media*, which is exceptional among plantains in its fragrance and in its coloured corolla.

Blue flowers are very rarely fragrant, and when so, only in a slight degree. The blue variety of *Phyteuma spicata* exhales a faint perfume, and one or two campanulas are slightly scented. *Franciscea Hopeana* has, however, deliciously fragrant blossoms, which recall at once the scent of the orange and the tuberose; but although at first blue, they soon lose their colour and become white.

Certain species, the flowers of which are of sombre hues, are very fragrant. Thus in the early flowering *Calycanthus præcox*, one finds a multitude of odours, such as rose, jasmine and tuberose, harmoniously blended. The night-flowering stock (*Matthiola tristis*), *Hesperis tristis*, and one or two more, compensate by their fragrance for the absence of beauty of colour; while other dark-flowered plants, such as the henbane, have an intensely disagreeable odour.

Thus we see that it is not the most brilliant flowers which are the most fragrant, indeed, many of the most brilliant in colour have no scent whatever. The beautiful *Malvaceæ* of equinoctial America, the pelargoniums of the Cape, the passion-flowers [?], the gladioli, and some of the most striking *Leguminosæ* are destitute of perfume.

One or two conclusions as to the geographical distribution of sweet-scented plants may be arrived at from the preceding facts, united with many more which space will not permit us to cite. We have seen that a large proportion of pale and white blossoms are fragrant; and it is ascertained that these predominate in northern regions. We may therefore conclude that the relative number of odorous flowers is greater towards the poles than towards the equator. It would seem that the too powerful action of light and heat is opposed to the emanation of the odours of flowers; and we see many species, which are scarcely fragrant during the day, become so in the evening or at night. But if the odours emitted by the blossoms are more frequent in the North, the reverse is the case with the essences enclosed in the glands. Plants with fragrant leaves, aromatic fruits, and wood penetrated with essential oil, are scarcely found except in warm or tropical countries.

* See also, "On the Relative Powers of various Substances in the Destruction of Microscopic Organisms," in the *Lancet* of Aug. 6th, 1870.

† Reprinted from the *Gardeners' Chronicle.*

CITRIC ACID AND A NEW CLASS OF COMPOUND CITRATES.*

BY J. CREUSE.

Having undertaken the study of the citrates as a class, and especially of those of the citrates where the acid is combined with more than one base, the first difficulty I met was how to estimate citric acid without having recourse to the long and complicated process of an organic elementary analysis. I consulted the most recent publications and some eminent chemists without obtaining my desideratum, viz.—How to estimate citric acid free and combined, in the same direct manner as sulphuric or muriatic acid? The only thing then left for me was to try myself and find such a process, in which I succeeded, after many failures, including an explosion of citrate of silver.

This process is founded on the fact that while the alkaline citrates, the alkaline acetates and the acetate of baryta are freely soluble in alcohol sp. gr. 0·805 (63° Tralles), citrate of baryta is completely insoluble in that menstruum.

As the presence of alkaline acetates does not interfere with the reaction, this enables the chemist to estimate citric acid in almost any shape, for free citric acid may be saturated by an alkali, alkaline citrates may be analysed directly, and other citrates may be converted into citrate of potash without difficulty. This method presenting peculiar features, I will describe it in full.

If the citric acid to be estimated is in the shape of an alkaline citrate, take from 1 to 2 grams of the salt, dissolve in 10 to 20 c.c. of water, neutralize the solution with acetic acid if it is alkaline, with ammonia if acid; add a slight excess of a neutral solution of acetate of baryta and twice the volume of the whole liquid of alcohol 95°. Allow it to rest from twelve to twenty-four hours; the citrate of baryta, which is at first like a thick jelly, has by that time become denser and easier to wash. Transfer the whole to a filter; but as some of the precipitate always adheres to the sides of the vessel, it is recovered thus: pour into the vessel 10 to 15 c.c. of water, turn it round so as to wet all the parts where any salt adheres: citrate of baryta, being to a certain extent soluble in water, is soon taken up; add then double the volume of alcohol and pour on the filter with the first product. This being repeated a second time, all the citrate of baryta may be considered as collected on the filter. Wash this thoroughly with alcohol 63° and dry at a moderate heat. The precipitate thus obtained represents all the citric acid in the shape of the citrate of baryta; $3\,BaO, C_{12}H_5O_{11}$ with a variable proportion of water. But this salt is too hygrometric to give correct results if weighed directly; it is necessary to transform it into sulphate of baryta. This is done without difficulty by burning the filter and heating the ashes and precipitate to red heat with sulphuric acid several times till a constant weight is obtained. This being ascertained, the weight of the citric acid may be calculated within 2 milligrams.

If free citric acid is to be estimated, a convenient quantity may be first saturated with a titrated solution of caustic soda, which gives generally a little more than the actual strength; the citrate of soda may be then treated in the manner described above, which gives a result a little below the truth, and the average between the two will be within 1 milligram.

If it is necessary to estimate the citric acid of a non-alkaline citrate, soluble or otherwise, the analysis is conducted in this manner: a certain weight of the salt, from $\frac{1}{5}$–$\frac{2}{5}$ grm. is heated carefully with a solution of caustic soda or potash in excess; the heat must be applied long enough to decompose the salt thoroughly, but not enough to alter the citric acid. The liquid is then filtered, the filter washed as usual, and the liquor, exactly saturated with acetic acid, may be treated as an alkaline citrate. Care must be taken in this case, as in the others, that the saturation be as perfect as possible, for an excess of acetic acid causes the citrate of baryta to become soluble in alcohol, and an excess of alkali would precipitate some free baryta.

The solution of acetate of baryta used for these analyses may be prepared by treating pure diluted acetic acid by an excess of carbonate of baryta, heating to ebullition, adding some alcohol when cold, and filtering. This solution may be filtered to contain 5 per cent. of baryta, so as to know very nearly how much of it is necessary to precipitate the alkaline citrates thoroughly, without too much excess of the reagent. The addition of alcohol ensures its keeping unchanged for an unlimited period.

I need not describe here any analysis of citric acid, but I shall describe the analysis of some metallic citrates.

ANALYSIS OF CITRATE OF BISMUTH.

This citrate of bismuth is the salt obtained by precipitating acid nitrate of bismuth by an alkaline neutral citrate. It is insoluble in water, and may be obtained pure without difficulty; 2 grams of this salt were taken and decomposed by an excess of caustic potash, at a moderate heat. The precipitate of teroxide of bismuth well washed and dried was found to weigh 1·122 grm. The washings were collected together, saturated with acetic acid, treated by acetate of baryta and alcohol, as already mentioned, and the citrate of baryta thus formed, yielded 1·674 of sulphate of baryta, which corresponds to 0·788 of citric acid. The balance 0·09 represents the equivalents of water and the loss. Hence, we may figure the result thus:—

Teroxide of Bismuth .	1·122	or in other terms	1·170 = 1 equiv.
Citric Acid (anhydrous)	0·788		0·825 = 1 ,,
Water	0·086		0·090 = 2 ,,
Loss	0·004		
	2·000		2·085

From this we may deduct for citrate of bismuth the following formula:—

$$BiO_3, C_{12}H_5O_{11} + 2HO = 417.$$

ANALYSIS OF THE DOUBLE CITRATE OF BISMUTH AND AMMONIA.

This salt is commonly called ammonio-citrate of bismuth or soluble citrate of bismuth. It is obtained in two forms, in solution and in scales. In solution it may be either acid or neutral, in scales it is always acid on account of the loss of some ammonia during evaporation. It is very extensively used in medicine, but unfortunately is rather unstable in solution.

The analysis of the neutral salt offered no difficulty: 2·085 grm. of insoluble citrate of bismuth were weighed in a small porcelain dish, a little warm water added, and a small piece of litmus paper allowed to float on it. Then a filtered solution of ammonia containing 0·26 of ammonia to the 100 measures was cautiously added, the mixture being stirred all the time. As the last drop of the 100 measures fell into the porcelain dish, the litmus paper, red until then, turned blue, and in the same time the liquid became perfectly clear.

This gives for the neutral citrate of bismuth and ammonia the following formula:—

$$2NH_3, BiO_3.\ C_{12}H_5O_{11} + nHO.$$

The analysis of the salt in scales was conducted in this wise: 2·302 grms. of the ammonio-citrato of bismuth in scales were dissolved in a little warm water, and a small piece of blue litmus paper made to float on the liquid. The paper turned red immediately. Then the same filtered solution of ammonia already mentioned was added carefully till saturation; 25 measures were necessary, which corresponds to $\frac{1}{2}$ equivalent. This demonstrated

* Reprinted from the *American Journal of Pharmacy*.

already that the quantity of ammonia contained in the salt was $1\frac{1}{2}$ equivalent.

The liquid was then decomposed by caustic potash in excess, with the help of a moderate heat, etc., precisely in the manner described for the analysis of citrate of bismuth. The following numbers were obtained:—teroxide of bismuth 1·170, citric acid 0·823.

The proportion of ammonia being already known, the compound may be reconstructed thus:—

Teroxide of Bismuth	1·170 = 1	equivalent
Citric Acid . . .	0·823 = 1	,,
Ammonia	0·122 = $1\frac{1}{2}$	,,
Water	0·180 = 4	,,
Loss	0·007	,,
	2·302	

Or in chemical symbols:—

$$1\tfrac{1}{2}NH_3,BiO_3.\ C_{12}H_5O_{11} + 4HO = 460{\cdot}4.$$

I must say that in this salt I believe the proportion of ammonia may vary slightly, according to the mode of evaporation; this proportion, however, cannot fall below $1\frac{1}{2}$ equivalent without causing a decomposition.

ANALYSIS OF THE DOUBLE CITRATES OF BISMUTH AND POTASH, SODA AND LITHIA.

I believe these combinations have never been mentioned nor obtained yet by anybody. Yet, besides their interest in a chemical point of view, I think they will become of some importance to the medical profession, on account of their greater stability than the corresponding ammonia salt. For instance, a solution of citrate of bismuth and soda may be kept for weeks in warm weather without the addition of alcohol; the only change observable is the mouldiness common to all the diluted solutions of citrates, while a solution of citrate of bismuth and ammonia by the side of it is decomposed in twenty-four hours, letting the ammonia escape and forming a heavy insoluble sediment which contains almost all the bismuth.

The citrate of bismuth and soda, and the corresponding potassic salt are obtained easily by adding two equivalents of the caustic alkali to one of citrate of bismuth suspended in water, moderate heat being applied. They require, however, a little more care than the analogous ammoniacal combination, for any excess of potash or soda is liable to precipitate oxide of bismuth, a decomposition that ammonia will not effect under any circumstances. The double citrate of bismuth and lithia may be prepared by adding two equivalents of carbonate of lithia to one of citrate of bismuth, heat being applied.

The following are the formulas of these double salts:—

Citrate Bismu. and	Potash	$2KO,BiO_3.\ C_{12}H_5O_{11}+nHO$
,, ,,	Soda	$2NaO,BiO_3.\ C_{12}H_5O_{11}+nHO$
,, ,,	Lithia	$2LiO,BiO_3.\ C_{12}H_5O_{11}+nHO$

Not having obtained these compounds in scales yet, I have not been able to determine the equivalent of water.

My study of the citrates is far from being completed, but I have collected facts enough to justify me in proposing to divide the different citrates into three classes.

In the *first class* I would place all the various *simple citrates*, where the acid is combined with one, two or three equivalents of one base. These are so well known, that little need be said about them.

The *second class* would comprehend the *double citrates*, that is, those salts in which one equivalent of citric acid is combined with two equivalents of an alkali and one equivalent of another base, generally metallic. The simple citrate of that base is always less soluble than its double citrate. The various double citrates of bismuth mentioned in this paper may be considered as types of the second class, which contains a great number of them. Many are known and mentioned, such as ammonio-citrate of bismuth, of iron; potassic citrate of zinc, magnesia, etc.; their composition, however, is not stated anywhere to my knowledge.

The *third class*, or *quadruple citrates*, as I propose to call them, is not so well known,—the only one being, I believe, the soluble pyrophosphate of iron discovered in 1856 by E. Robiquet, my old friend and employer. These salts I consider as a combination in which an alkaline neutral citrate plays the part of a base and a peculiar metallic salt the part of an acid. I have abundant facts to prove the correctness of my theory, but I will only mention that I have already discovered the following new combinations which I place in the third class of citrates:— Phosphate, hypophosphite, valerianate, arseniate, sesquioxide of iron and several others, with citrates of potash, soda, lithia and ammonia.*

All these salts are very soluble, they all have a greenish colour and present no taste of iron.

SEWER GASES.

Epistolary effusions emanating from sanitary luminaries have lately deluged the public journals. If they have not succeeded in teaching us how to rid ourselves of the invisible death-dealing compounds arising in the form of sewer gases, it should afford their writers some satisfaction that their pet theories have been freely ventilated. According to the authorities alluded to, the gas is like Sir John Falstaff's otter—"you never know where to have it." Allow it to escape in one direction, and fancy you have got rid of it, "up it pops" in an unexpected quarter, "blows open your traps," and poisons your habitation. As the tide ebbs and flows so the gases surge about, and, from more uncertain and unknown causes, appear always ready to attack you at your weakest point and carry your defences. A storm will produce sudden and unequal commotion attended by uncertain phenomena, and it is practically impossible to adequately provide against and secure safety from this subtle evader of ordinary bolts and bars, by the precautionary measures hitherto suggested; even if such suggestions offered anything approaching to a sound solution of the problem involved.

It is proposed, in some places, to use trays containing charcoal under the sewer gratings, and ventilators, to send tall chimneys up into the air, and pipes with outlets above the eaves of houses, and, to use the expression of a Government official, to "dilute the gas by admixture with the outer air," in every possible direction. Such ideas, if carried out, would be, in fact, calculated to increase the amount of evil, and are a mere paltering with a subject of vital importance to the public health.

Is not the air of London sufficiently foul already? What is to become of these gases when they get abroad, containing, as is supposed, the germs of disease? Is the already-tainted air we are obliged to breathe to be further charged with such abominations? In our climate, with its oftentimes heavy atmosphere, the volumes of noxious gases carrying these disease-germs would rise only to a certain height, and probably spread and extend like a pall over the Metropolis. If a gentle breeze were to blow from the east, the perfumes wafted into Hyde Park and Kensington Gardens would remind the seekers of pure air and recreation of anything but the gales from "Araby the Blest;" and the inhalation by children and others of poisonous germs would thus transform a region of recreation into a plague spot.

That prevention is better than cure is an axiom which cannot be controverted. There is a radical remedy for the evil, and it seems incomprehensible that public attention has not been more particularly directed to it. Why are these sewer gases allowed to form? We have the power of binding and chaining the satanic agency, why then let it get abroad to seek whom it may devour?

The formation of sewer gases may be effectively prevented by arresting the decomposition of organic matter as it passes through the sewers. No systematic attempt

[* The solubility of phosphate of sesquioxide of iron in citrate of ammonia was noticed in 1859 by Mr. A. F. Haselden and the Editor of the *American Journal of Pharmacy*.]

has ever been made to deodorize our drains and sewers although the quantity of sewage to be dealt with and the effect of disinfectants on known quantities of organic matter has been ascertained. It is true that occasionally, under the dread of cholera, spasmodic efforts have been made in a desultory manner to deodorize drains in the summer time, but the system should be carried out all the year round. And it can be effected with greater economy than any other attempts to trifle with the difficulty, and inaugurate systems which have a positive tendency to accelerate the mortality of the multitude.—*Milk Journal.*

THE ALKALOIDS OF OPIUM.

BY O. HESSE.*

In order to obtain the rarer alkaloids, the black mother-liquors were taken (as obtained in the Robertson-Gregory process) from which the hydrochlorides of morphine, codeine and pseudomorphine had been separated. This liquor was first treated with an equal volume of water and precipitated with excess of ammonia; the clear liquor was exhausted with ether, and this again treated in the manner described in the Ann. Chem. Pharm. vol. cliii. p. 47. The alkaloids thus obtained can be now separated into two parts, the one insoluble, and the other soluble in excess of sodium hydrate. The alkaline solution, treated according to a former method, deposits first a small quantity of lanthopine, the filtrate from which contains neither codeine nor meconidine, for it is not coloured on warming with sulphuric acid; from it the author has obtained a small quantity of codamine. The solution is precipitated with ammonia, and the hard precipitate dissolved in a very small quantity of boiling dilute alcohol. White crystals are thereby obtained, from which the laudanine is separated by the action of hydriodic acid, with which it forms a difficultly soluble compound. *Laudanine* has the composition $C_{20}H_{25}NO_4$, instead of the formula $C_{20}H_{25}NO_3$, as formerly given; its melting-point is 166°. *Codamine* is found to melt at 126°, instead of 121°, and has probably the composition $C_{20}H_{23}NO_4$.

The portion insoluble in sodic hydrate, which must contain thebaine and papaverine, is dissolved in acetic acid, and the solution is neutralized in presence of alcohol, whereupon a crystalline precipitate is formed, consisting of papaverine and narcotine, which can be separated by oxalic acid. The melting-point of *narcotine* is given by the author as 176°, instead of 170°.

Papaverine, $C_{21}H_{21}NO_4$, when absolutely pure, dissolves in small quantities of sulphuric acid without coloration; generally, however, on warming a crystal of papaverine with concentrated sulphuric acid, a dark blue colour is produced, but when other crystals are added the colour is not increased; on the addition of water, papaverine sulphate is precipitated, as a resinous mass, which after a short time solidifies. No other alkaloid of opium gives this reaction; pseudo-morphine, which is the only one that is precipitated from its sulphuric acid solution by water, is obtained as a crystalline powder, not a resinous precipitate. Dilute nitric acid converts papaverine readily into nitropapaverine,

$$C_{21}H_{20}(NO_2)NO_4 + H_2O,$$

which occurs in colourless thin prisms, melting at 163°, and becoming yellow on exposure to light. When chloride of zinc and impure papaverine hydrochloride are allowed to act together for a short time, the impurities are decomposed, and a hydrochloride of an alkaloid is obtained, which agrees in properties with pure papaverine hydrochloride. The new alkaloid forms with acids very handsome crystalline salts, resembling the salts of cryptopine.

The neutralized acetic acid solution, from which the narcotine and papaverine have been separated, contains *thebaine*, which can be separated as the bitartrate by adding powdered tartaric acid. Instead, however, of tartaric acid, concentrated hydrochloric acid is added, which keeps the thebaine in solution, whereupon crystals of cryptopine hydrochloride are formed. From the dark coloured liquid still remaining, the author has been able to separate three other alkaloids, protopine, laudanosine and hydrocotarnine, by processes which will be described in another memoir.

Cryptopine, $C_{21}H_{23}NO_5$, melts at 217°, dissolves easily in chloroform, with difficulty in alcohol and is insoluble in ether. It is strongly basic, and forms salts which can be obtained in crystals; with hydrochloric acid it forms two salts $C_{21}H_{23}NO_5 . HCl + 6H_2O$, and with $5H_2O$, but the author has not obtained the salt with $2HCl$, as found by T. and H. Smith. It is precipitated from cold neutral solution by hydrochloric acid as a gelatinous mass, but from hot solutions prisms are deposited.

Protopine, $C_{20}H_{19}NO_5$, may be separated easily from the former alkaloid; it forms solid prisms with hydrochloric acid. It melts at 202°, and is somewhat difficultly soluble in alcohol and insoluble in ether.

Laudanosine, $C_{21}H_{27}NO_4$, dissolves sparingly in cold, but easily in hot benzol; it forms colourless prisms which melt at 89°. It is easily soluble in alcohol and ether, and has a basic reaction; with hydriodic acid it forms a very difficultly soluble salt.

Hydrocotarnine, $C_{12}H_{15}NO_3$, crystallizes in large colourless prisms, with $\frac{1}{2}H_2O$ as water of crystallization; they melt at 50°, and give up the half-atom of water. It volatilizes at 100° with partial decomposition, it dissolves easily in ether and alcohol; behaves like narcotine with concentrated sulphuric acid. Its reaction is basic, and it neutralizes dilute acids, forming salts which are easily soluble in water.

The author appends a valuable table, giving the colorations observed when the various alkaloids are dissolved in pure strong sulphuric acid, and in acid containing traces of iron.

	Dissolves in Pure Acid.		In Acid containing Oxide of Iron.	
	At 20°.	At 150°.	At 20°.	At 150°.
Codeine . . .	Colourless	Dirty green. .	Blue	Dirty green.
Codamine . .	Colourless	Dirty red-violet	Intense green-blue. .	Deep violet.
Laudanine . .	Very faint rose-red	Deep red-violet	Brown-red, similar to cobaltic nitrate solution	At first green, then deep violet.
Laudanosine .	Faint rose-red, somewhat stronger than laudanine	Ditto	Ditto	Ditto.
Cryptopine . .	At first yellow, then violet, and finally deep violet	Dirty green. .	Deep violet	Dirty green.
Protopine . .	At first yellow, then red, and finally bluish-red	Dirty greenish-brown	Ditto	Dirty greenish-brown.

* Deutsch. Chem. Gesch. Ber. iv. 693; from the *Journal of the Chemical Society.*

THE CHICAGO COLLEGE FUND.

The following is a list of the subscriptions promised up to January 3rd, 1872.

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Annales de l'Exposition du Havre, par Ribeyre. Rimmel's Book of Perfumes. Rimmel's Recollections of the Paris Exhibition. Specimens illustrating Manufacture of Perfumery.

John Beddard, 46, Churton Street, S.W.

Accounts of Belfast Harbour, 1786–1845. Papers by Dr. Davy. On the Commercial Relations of the United States. Archeia tēs Hellēnikēs Palingenesias. Report on Silks and Wines, 1835. Enquiries concerning Europe, 1758. Edinburgh New Dispensatory, 1786. Ditto, 1816. Bartlett on Consumption. P. Terentii Comœdiæ sex, 1739. Chemistry as exemplifying the Beneficence of God. Fownes. Xenophontis Œconomicus, 1750. Hunt on the Skin. Hamilton's Young Practitioner's Companion. Aikin's Materia Medica, 1785. Les Offices de Cicéron.

G. C. Walmough, 46, Churton Street, S.W.

Dewhurst's Medical Adviser, 2 vols. Meade's Manual of Prescriptions, 1835. Smedley's Practical Hydropathy.

Colchester Chemists' Association.

Muspratt's Chemistry, 2 vols. Lardner's Science and Art, 12 vols. Orr's Circle of the Sciences, 9 vols.

F. Sutton, Norwich.

Sutton's Volumetric Analysis.

T. and H. Smith and Co., Edinburgh.

Specimens of Chemicals.

C. R. C. Tichborne, 40, Mary Street, Dublin.

H. Draper,—Specimens of Anthraquinone and Picric Acid. *Dr. C. Cameron*,—The Stock Feeder's Manual; Handy Book on Food; Handy Book on Health; Lectures on Health; Original Papers and Reports. *Dr. E. Mapother*,—Lectures on Public Health; Medical Representation in Parliament; Animal Physiology; Original Papers. *C. R. C. Tichborne*,—Specimens of Bromide and Iodide of Potassium; Original Papers and Researches.

The Pharmaceutical Journal.

SATURDAY, JANUARY 6, 1872.

Communications for this Journal, and books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE NEW YEAR.

IT has been said that *les jours se passent et se ressemblent*, and the saying is partly true in the pharmaceutical as well as in the ordinary world. Being continually engaged in the endeavour to keep our readers abreast of the literature of pharmacy and its kindred sciences, we are, for this reason, unable, at the commencement of another year, to bring under their notice any remarkable novelty, but we may perhaps point to the issues of this Journal during the past year as containing a faithful record of pharmaceutical history in England during 1871. Compared with its predecessors that year will certainly bear a reputation for bellicosity; for pharmaceutists have not been allowed to rest satisfied with supping to the full of the horrors recorded of the Franco-German war, but have themselves been divided into two camps, for and against the proposed regulations for the dispensing and storing of poisons. Happily in this case it may be presumed that all the parties to the strife had the same object in view, although seeking it by different ways. Let us express a hope, however, that such contention may not be renewed.

One marked feature in the history of the year has been the attention devoted to the subject of provincial education, and the efforts that have been made by the local societies to obviate the hardships that may have been imposed upon insufficiently educated assistants and apprentices at the time of the Pharmacy Act. It is also satisfactory to see that there is a general feeling that this work once done, there should be an end to it, and that future apprentices should be made to acquire the education before entering the business.

Although this Journal has been the vehicle for publishing very many valuable papers written by English pharmacists, we are persuaded that much more remains to be done in this direction. A comparison of the number of contributors with that of the whole body would quickly show that they are but few in proportion, and that the same names occur again and again. May we suggest that in future more of our readers should contribute to the information of all by recording the results of such experience as they think may be useful. We are indebted for much assistance to the kindness of a few local secretaries and provincial members for matter of a more general interest. Here again were the number of our correspondents increased, and if every member were to make a point of forwarding information of any circumstance likely to be of interest, our record would be a more perfect one. To those gentlemen who have assisted us in the past we tender our heartiest thanks, and express a hope that they will still continue their valuable help.

One word in conclusion. We cannot hope that absence of complaint denotes entire satisfaction. The readers of this Journal are perhaps too varied in their tastes and requirements to render this probable; but if in the coming year any persons have suggestions to make as to ways in which these tastes and requirements may be more fully met, we trust that they will not hesitate to communicate them directly to the Editor, who will give them the most careful consideration.

THE BENEVOLENT FUND.

"No one liveth to himself," was the inspiration that guided WILLIAM ALLEN, CHARLES JAMES PAYNE, and divers others, when they first petitioned for a Royal Charter of Incorporation, having the double object of promoting education, and providing a fund for the relief of the distressed Members and Associates of the Society, their Widows and Orphans. The Fund has slowly yet steadily advanced. Once, indeed, a certain amount of apathy seemed to imperil its existence. Great efforts were then made to enforce its claims, nor can the untiring services of the late Mr. BENJAMIN ORRIDGE ever be forgotten. The opening of a New Year speaks to us most eloquently of our duty to those around us. Let us listen to the voice, remembering that while it is always one of the noblest privileges to help our fellows, in this case even selfishness may stimulate our liberality, for no man living can count upon the chances of his own position. There are two plain facts that cannot be too well understood. A sum of £12,000 is invested in our Benevolent Fund, and at this we rejoice. The interest provides for twelve Annuitants, *but* there are thirteen. One Annuity is therefore paid out of the annual subscriptions, which should be exclusively devoted towards meeting the numerous claims for temporary assistance. £1000 is therefore urgently required as an investment, in order to allow the operations of the charity to flow in their proper channel.

Secondly, we are at liberty to appeal for aid with the utmost confidence, for the Fund is now available not only to persons connected with the Society, but also for the relief of all Chemists and Druggists. We learn with pain that a vast majority of these latter contribute most slenderly to the subscription list of this admirable institution. Surely, distress, poverty, and privation should bind us all together in one common brotherhood. Great praise is due to some of our Local Secretaries, who, by their own example and energetic canvass, have rendered essential service. They have made the *existence* of the Fund known, and in a direct manner pointed out its usefulness amongst the trade.

It is worthy of notice, that wherever the Local Secretary himself takes an interest in the work, the Fund flourishes, the good seed sown yields often an abundant harvest, and the list gives evidence that in some towns *every* Chemist and Druggist has contributed; while in the same place there are not wanting the names of many totally unconnected with pharmacy.

Must we in this century, an age of noble endeavour and self-denial, defend or praise benevolence? Shall we, who with unsparing hand help other countries, one not even speaking our own language, neglect our home duties, and starve our home liberalities?

Let not the widow and the orphan plead in vain; let misfortune tell her story of want and wretchedness, and let scarce and dear provisions for once turn orator!

So shall we enter upon the New Year with lighter hearts, for we shall have helped to bear each others' burdens, and our own fireside shall glow all the more brightly when we reflect that we have kindled hope in many a desponding soul; and know that we have tried to resemble the Great Pattern who himself became poor, that we through his poverty might be made rich.

THE PHARMACEUTISTS' ASPECT OF THE MEDICAL DECLARATION RESPECTING ALCOHOL.

We published last week the declaration respecting alcohol, which has been, and is, a leading subject of discussion in medical and other circles. There are, of course, pros and cons in this as in most other questions, but there can be little doubt that the "nip" of sherry between meals, and its continual multiplication between noon and the dinner hour, has much to do with chronic alcoholism, a disease that has increased more than cent. per cent. during the past ten years. But we refer to this subject again, in order to indicate that there is an aspect of the matter specially pertinent to pharmaceutists. Will any of our readers (east or west, no matter) pause to consider how often they, or their assistants, are asked for "pick-me-ups" by their male, and for that popular composition commonly known as "red lavender," by their female clients? Have they any idea at all as to what proportion of gentian, lavender, and other tinctures, of eau de cologne, chloral hydrate, and compound spirits of ammonia sold is taken for really legitimate and beneficial purposes? These are questions well worthy of consideration, and we believe that those of our readers, who consider them carefully in all their bearings, will come to the conclusion that the sale of these articles for the plain purpose of producing an artificial stimulus to mental or physical exertion has, during the past few years, increased in a most marked degree, and to a most pernicious extent. We believe that chemists could, if required, give most valuable evidence on this point; for it is perfectly well known to all medical men practising in London that many of their upper and middle-class clients of the other sex, not daring to keep a brandy bottle in their closets, find nevertheless a convenient and (as they suppose) a safe substitute in the imbibition of small and oft-repeated doses of lavender tinctures, eau de cologne, etc. And it is as patent that our readers must know a great deal about the way in which these articles are obtained, and can form also a tolerably correct idea as to the rate of consumption. In all matters relating to the health and well-being of our populations the physician and the chemist may work most usefully together, and we take leave to suggest that, on some of the points above indicated, pharmaceutists might very well strengthen the hands of the medical profession in their laudable endeavours to stem the alcoholic current that is sapping the foundations of many grand intellects, and many brilliant minds in this big city.

THE LIBRARY.

It will be seen that in compliance with a wish which has been expressed,* the Council has decided that the Library shall be kept open on Tuesday and Thursday evenings from eight to ten o'clock. This arrangement is to be commenced at once, and trial made of it for three months. On two former occasions the experiment was tried, but the attendance was so small that it was discontinued; it is therefore hoped that now the Council has again provided for the alleged need there will not be wanting those who are ready to avail themselves of the privilege.

We are informed that the Board of Trade has decided to substitute chlor-alum for the solution of chloride of zinc, at present included in the scale of medicines and medical stores, issued and caused to be published by that Board, in pursuance of the "Merchant Shipping Act, 1867."

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

January 3rd, 1871.

MR. A. F. HASELDEN, F.L.S., PRESIDENT, IN THE CHAIR.

Present—Messrs. Atherton, Betty, Carr, Greenish, Groves, Hills, Sandford, Shaw, Smith, Sutton and Williams.

The minutes of the last meeting were read and confirmed.

The Report of the Finance Committee was presented, showing on the General Fund Account a balance in the Treasurer's hands of £758. 1*s*. 9*d*.

On the Benevolent Fund Account a balance of £198. 18*s*. 5*d*.

* See *ante*, p. 380.

The Report of the Finance Committee was received and adopted, and sundry payments ordered.

Resolved—That the Report of the Benevolent Fund Committee be received.

Resolved—That the Treasurer be requested to pay the Thirteen Annuitants respectively their quarter's annuities to Lady Day next.

Resolved—That, in accordance with the Bye-laws, two hundred pounds stock be purchased on the Benevolent Fund account.

The Report of the House Committee, giving the tenders for the alterations in the basement, and other work previously decided on by the Council, was presented, with a recommendation that the tender of Messrs. Patman and Fotheringham be accepted.

Resolved—That the Report and Recommendations of the House Committee be received and adopted.

The Report of the Library, Museum and Laboratory Committee was presented, recommending

That the following books be purchased for the Library:—Wanklyn and Chapman's 'Water Analysis,' 2nd ed.; Beasley's 'Pocket Formulary,' 9th ed.; Page's 'Text-Book of Geology;' Lyell on Geology; Cavendish Society's publications.

That the Library should be kept open on Tuesday and Friday evenings from 8 to 10 P.M., and that this arrangement should be continued, as an experiment, for three months, a record of attendances being kept.

Resolved—That the Report and Recommendations of the Library, Museum, and Laboratory Committee be received and adopted, and that an advertisement be inserted in the Journal of the Society to the effect that the Library will be open on Tuesday and Friday evenings from 8 to 10 P.M.

Resolved—That the Report and Recommendations of the Parliamentary Committee be received and adopted.

REPORT OF THE BOARD OF EXAMINERS.

December, 1871.

ENGLAND AND WALES.

	Candidates examined.	Candidates passed.	Candidates failed.
December 20, Major	5	5	0
” ” Minor	22	13	9
” 22, ”	22	14	8
	49	32	17

PRELIMINARY.—Certificates received in lieu of this Examination:—4.

Resolved—That the following, having been duly registered as Pharmaceutical Chemists, be respectively granted a Diploma stamped with the seal of the Society:—

Brown, Frederic Peter ...... Grantham.
Brown, James .... Ampthill.
Forsbrook, William Henry .. Birmingham.
Jones, William Ellis .... Barmouth.
Keen, Benjamin .... Uppingham.

Resolved—That the following Pharmaceutical Chemists be, and are hereby elected Members of the Society:—

Catterns, Heneage Parker .... London.
Clarke, Arthur Henry .... Croydon.
Delves, George .... Exeter.
Holton, John Henry .... New Grimesthorpe.
Keen, Benjamin .... Uppingham.
Maddock, William Thomas .. Portsmouth.
Naldrett, George Thomas .... London.
Ward, John Slinger.......... York.

Resolved—That the following Registered Chemists and Druggists be elected Members of the Society:—

Buckland, Edwin .... Sutton-in-Ashfield.
Crook, Charles .... Mirfield.
Fisher, Edwin .... Ashton-under-Lyne.
Jeffery, Henry .... Bristol.
Jones, Benjamin .... Twickenham.
Jones, Thomas .... Oswestry.
Lea, Edward................ Whitchurch, Salop.
Litherland, Henry .... Wigan.
Matthews, Henry............ Bristol.
Woods, William .... Plymouth.

Resolved—That the following having passed their respective examinations, and being in business on their own account, be elected "Associates in business":—

MINOR.

Cooper, William John........ Cockermouth.
Linklater, James .... Lerwick.
Nicholson, Edward .... Lindley.

MODIFIED.

Bardsley, William .... Peckham.
Barrow, James Horsfield...... Southport.
Bowles, William James ...... London.
Burgess, Frederick Augustus.. London.
Dubois, Bernhard William.... London.
Gray, James Thomas .... Crewe.
Southern, Joseph .... Manchester.
Woolrich, Francis .... Nottingham.

Resolved—That the following, having passed their respective examinations, be elected Associates of the Society:—

MAJOR.

Wilford, Josiah.............. Newport Pagnel.

MINOR.

Beach, Tom Clarke .... Great Malvern.
Bryars, William Hudson ..... Goole.
Fuller, John William .... London.
Graham, John .... Dumfries.
Green, Thomas.............. Belfast.
Hargreaves, Joseph .... Liverpool.
Hensby, Robert Place .... Maidstone.
Hill, William .... Louth.
Hinksman, John .... Edinburgh.
Kennerley, William.......... Manchester.
Leman, Alexander .... Aberdeen.
McNaught, Archibald........ Greenock.
Mellor, Thomas .... Bury.
Peake, Arthur .... Stalybridge.
Place, John Newton .... Cambridge.
Saunders, Thomas Samuel .... Notting Hill.
Tuck, William James .... Portsmouth.
Tucker, William Tyler ...... Worthing.
Wade, James Henry .... London.
Williamson, Nicholas .... Whitehaven.
Windlo, John Thomas........ Norwood.

MODIFIED.

Frizell, Richard William ..... London.
Harcus, John................ Newcastle.
Ross, William .... Galashiels.
Sansom, Henry.............. Hitchin.
Starie, William Chantler ..... Bristol.
Taylor, Alfred .... Kendal.
Womack, Thomas .... Barnsley.

SUBSCRIPTIONS AND DONATIONS TO THE BENEVOLENT FUND FOR 1871.

SUBSCRIPTIONS.—LONDON.

	£.	s.	d.
Allchin, Alfred, Richmond Road, Barnsbury, N.	0	10	6
Allgood, Edmund J., 22, Belle Vue Terrace, Seven Sisters Road, N.	0	5	0
Anderson, Charles, 23, Lower Belgrave Street, S.W.	1	1	0
Andrews, Frederick, 23, Leinster Terrace, W.	0	10	6
Applegate, E., Upper Holloway, N.	0	10	6
Attfield, Prof., 17, Bloomsbury Square, W.C.	1	1	0
Attwood, A., 147, Cannon St., E.C.	1	1	0
Bacon, J. T., per Mr. Mould, Moorgate Street, E.C.	1	1	0
Baker, Alfred P., 33, Norfolk Terrace, Westbourne Grove, W.	0	10	6
Balch, E., 14, Claremont Place, N. Brixton, S.W.	0	5	0
Barnard, J., 338, Oxford St., W.	1	1	0
Barnes, J. B., 1, Trevor Terrace, Knightsbridge, S.W.	0	10	6
Barron, Fred., 2, Bush Lane, E.C.	2	2	0
Bartlett, W., 1, Bretten Terrace, Chelsea, S.W.	0	10	6
Batchelor, C. J. H., 6, Nugent Terrace, N.W.	0	5	0
Bate, H., Thorne Road, South Lambeth, S.W.	0	10	6
Beddard, J., 46, Churton Street, Belgrave Road, S.W.	0	10	6
Bell, W. H., 96, Albany St., N.W.	0	10	6
Bentley, Prof., 17, Bloomsbury Sq.	1	1	0
Best, J., 11, Jonson's Place, Harrow Road, W.	0	10	6
Betty, S.C., 6, Park Street, Regent's Park, N.W.	0	10	6
Bigg, Thomas, Great Dover Street, Borough, S.E.	1	1	0
Billing, T., 143, New Bond St., W.	0	10	6
Binge, T., Stockbridge Terrace, Pimlico, S.W.	0	10	6
Bird, Robert, 74, High Street, Clapham, S.W.	0	10	6
Bird, W. L., 42, Castle Street East, Oxford Street	1	1	0
Bolton, T., 98, Queen's Road, Dalston, E.	0	5	0
Bourdas, Isaiah, 7, Pont St., S.W.	1	1	0
Bourdas, Isaiah, jun., 48, Belgrave Road, S.W.	1	1	0
Bourdas, John, 7, Pont St., S.W.	1	1	0
Bowden, E. and A., 13, Charles Street, S.W.	1	1	0
Bradley, J., Brondesbury Terrace, Kilburn, N.W.	1	1	0
Bromley, Richard M., 3, Beckenham Place, Denmark Hill, S.E.	0	10	6
Brooks, C., Southville, Wandsworth Road, S.W.	0	10	6
Brown, H. F., 40, Aldersgate St.	0	10	6
Buck, T., 552, Kingsland Road, E.	0	10	6
Buckle, C. F., 77, Gray's Inn Road	1	1	0
Bullen, T., 13, Hereford Road, Bayswater, W.	0	10	6
Burden, T., 6, Store Street, W.C.	0	10	6
Burgoyne, Burbidges and Co., 16, Coleman Street, E.C.	2	2	0
Butt, Edward N., 13, Curzon St., Mayfair, W.	1	1	0
Cannon, C., 85, Upper Street, Islington, N.	1	1	0
Chard, F. J., 39, Warwick Street, Pimlico, S.W.	0	10	6
Cheetham, W. H., 22, Commerce Place, North Brixton, S.W.	0	10	6
"Chemists' Ball," Committee of	21	0	0
Chubb, James C., 102, St. John Street, E.C.	1	1	0
Churchill, Messrs., 11, New Burlington Street, W.	1	1	0
Churchyard, Robert L., 112, Camden Road, N.W.	0	10	6
Clarke, Arthur H., 217, Edgware Road, W.	0	10	6
Cocksedge, Henry B., 20, Bucklersbury, E.C.	0	10	6
Coles, F., 248, King's Rd., S.W.	0	10	6
Coles, John W., Camberwell New Road, S.E.	0	10	6
Constance, E., 37, Leadenhall St.	0	10	6
Cooke, John, 126, Hoxton St., N.	0	10	6
Cooper, A., 18, Abingdon Terrace, Kensington, W.	1	1	0
Cooper, W. H., 5, Andover Terrace, Hornsey Road, N.	0	10	6
Corbyn and Co., 300, Holborn, W.C.	1	1	0
Cornelius, James, 73, Camden Rd.	0	10	6
Covell, W. M., 302, Mare Street, Hackney, E.	0	5	0
Cracknell, C., 217, Edgware Road	2	2	0
Croyden, Charles, 37, Wigmore St.	0	10	6
Cruse, J. C., 27, Canonbury Pl., N.	0	5	0
Curtis, F., 48, Baker Street, W.	1	1	0
Darby and Gosden, 140, Leadenhall Street, E.C.	2	2	0
D'Aubney, Thos., 82, Shepherdess Walk, N.	1	1	0
Davenport, J. T., 33, Great Russell Street, W.C.	2	2	0
Davies, William, 292, Gray's Inn Road, W. C.	0	10	6
Davy, Yates and Routledge, New Park Street, S.E.	2	2	0
Deane, Henry, Clapham, S.W.	1	1	0
Dinneford and Co., 172, New Bond Street, W.	2	2	0
Dismorr, Henry, 6, Store St., W.C.	0	10	6
Doubell, J., Archer Street, Notting Hill, W.	0	5	0
Dyson, W. B., 4, Gloucester Road, South Kensington, S.W.	0	10	6
E. B., Hackney Road	0	5	0
Eade, George, 72, Goswell Rd., E.C.	0	10	6
Elkington, E., 56, Grange Road, Bermondsey, S.E.	1	1	0
Ellis, George H., 4, Finsbury Pavement, E.C.	0	10	6
Elvey, Thomas, 8, Halkin St. West	1	1	0
Evans, H. S., 60, Bartholomew Close, E.C.	1	1	0
Evans, J. H., 60, Bartholomew Close, E.C.	1	1	0
Eve, C., 59, High Street, Hampstead, N.W.	0	10	6
Faulconer, R. S., 270, Walworth Road, S.E.	1	1	0
Fenn, John T., 83, Regent Street, Westminster, S.W.	0	5	0
Field, James John, 22, Upper Gifford Street, N.	1	1	0
Field, W., 83, Brompton Rd., S.W.	1	1	0
Fincham, Robert, 57, Baker St., W.	1	1	0
Fisher and Haselden, 18, Conduit Street, W.	1	1	0
Fitch, Robert O., South Hackney, E.	0	10	6
Foott, Richard R., Stockbridge Terrace, S.W.	0	10	6
Forrest, R., 20, Cork Street, Bond Street, W.	1	1	0
Fowler, Stanley, 36, Elgin Crescent, Notting Hill, W.	1	1	0
Fox, W., 109 and 111, Bethnal Green Road, E.	1	1	0
Francis, G. Baggett, 5, Coleman Street, E.C.	1	1	0
Froom, W. H., 75, Aldersgate St.	1	1	0
Gabriel and Troke, White Street, Moorfields, E.C.	2	2	0
Gadd, C., 1, Harleyford Road, Vauxhall, S.W.	0	10	6
Gadd, Henry, High Street, Kingsland, E.	1	1	0
Gadd, R., 1, Harleyford Road, Vauxhall, S.W.	0	10	6
Gale, H., 3, Millbrook Place, Camden Town	0	10	6
Gale, Samuel, 338, Oxford St., W.	1	1	0
Gaunt and Fuller, 221, Union Street, Southwark, S.E.	0	10	6
Gedge, W. S., 90, St. John St., E.C.	0	10	6
Glover, George, 19, Goodge St., W.	1	1	0
Goddard, G. E., 37, Chapel Street	1	1	0
Goodwin, John, Lower Clapton, E.	1	1	0
Goosey, William, Stepney, E.	0	10	6
Gorton, John George, 144, High Street, Whitechapel, E.	0	10	6
Granger, Edwin John, Upper Clapton, E.	1	1	0
Gristock, T., 42, South Street, Manchester Square, W.	1	1	0
Groves, H. F., 4, Turret Grove, Clapham, S.W.	2	2	0
Grundy, T., 37, Leadenhall St., E.C.	0	10	6
Hanbury, Daniel Bell, Clapham Common, S.W.	1	1	0
Hardy, Samuel Croft, 338, Oxford Street, W.	0	10	6
Henty, H. M., 19, High Street, St. John's Wood, N.W.	0	5	0
Herrings and Co., 40, Aldersgate Street, E.C.	2	2	0
Hickey, Evan L., 199, King's Road, Chelsea, S.W.	0	10	6
Hickley, Thomas P., 297, Edgware Road, W.	0	10	6
Hickman, W., Archer Street, Notting Hill, W.	0	10	6
Hill, Arthur B., Little Britain, E.C.	1	1	0
Hill, Arthur S., Little Britain, E.C.	1	1	0
Hills, T. Hyde, 338, Oxford St., W.	5	5	0
Hodgkinson, Charles, 127, Aldersgate Street, E.C.	0	10	6
Hodgkinson, Stead and Treacher, 127, Aldersgate Street, E.C.	2	2	0
Hooper, Bartlett, 43, King William Street, E.C.	1	1	0
Hooper, L., 43, King William Street, E.C.	0	10	6
Hopkin, W. K., 10, New Cavendish Street, W.	1	1	0
Hora, H. W., 58, Minories, E.	1	1	0
Horncastle, John, 17, Craven Rd., W.	0	10	6
Howden, Robert, 78, Gracechurch Street, E.C.	1	1	0
Howell, Maurice, 61, High Street, Peckham, S.E.	0	10	6
Hugill, John, 147, Cannon St., E.C.	1	1	0
Humpage, Benjamin, Turnham Green, W.	0	10	6
Hunt, Charles, 29, Chapel St., S.W.	0	10	6
Hunter, John, 22, High Street, Kensington, W.	0	5	0
Huskisson and Sons, Swinton St.	2	2	0
Hyslop, J., Cahill, 54, New Church Street, W.	0	10	6
Ive, W., 2, Stanhope Terrace, S. Kensington, S.W.	0	10	6
Jacks, Ebenezer, 161, Gower Street	0	10	6
Jackson, James B., 89, Bishopsgate Street Within, E.C.	1	1	0
Jackson, J., Southampton Row, W.C.	1	1	0
Jeynes, G. W., 62, Princess Street, Edgeware Road, W.	0	5	0
Johnson, Benjamin M., 70, Tottenham Court Road, W.	0	10	6
Johnson, J., 8, Brondesbury Terrace, Kilburn, N.W.	0	10	6
Jones, Frederick, 175, Kentish Town Road, N.W.	0	5	0
Jones, Frederick Wm., 11, Norton Folgate, E.	0	10	6
Jones, Wm., 8, Richmond Ter., W.	0	5	0
Jones, W. O., 34, Cambridge Ter., Cornwall Rd., Notting Hill, W.	0	5	0
Kemp, R., 205, Holloway Road, N.	0	10	6
Kendall, C. F., 126, Clapham Road	0	10	6
Kent, T., 226, Blackfriars Rd., S.E.	0	10	6
Kent, T. R., 226, Blackfriars Road	0	10	6
Kernot, George C., 3, Chrisp Street, Poplar, E.	0	10	6
King, Thomas W., 108, Crawford Street, W.	0	5	0
Knight, J., New Park Road, Brixton Hill, S.W.	0	10	6
Knott, S., 15, Norton Folgate, E.	0	5	0
Lacey, Samuel, 21, Vassall Road, North Brixton, S.W.	0	2	6
Large, John H., 65, New North Rd.	0	10	6
Lawrence, Frederick, 383, Kentish Town Road, N.W.	0	10	6
Lescher, Joseph S., 60, Bartholomew Close, E.C.	1	1	0
Lidwell, J. E., 130, High Street, Notting Hill, W.	0	10	6
Linford, John S., 146, Holborn Bars, E.C.	0	10	6
Lockyer, George, Deptford, S.E.	0	10	6
Long, H., 48, High Street, Notting Hill, W.	1	1	0
McCulloch, F., 13, Hart Street, Covent Garden, W.C.	1	1	0
MacGeorge, W., 346, Essex Rd., N.	1	1	0
Maitland, John, 10, Chester Place, Hyde Park, W.	1	1	0
Marshall, C. E., 67, Bedford Street, Mile End, E.	0	5	0

	£.	s.	d.
Marston, J. T., 105, London Wall	0	10	6
Matthews, W., 12, Wigmore St., W.	0	10	6
Maw, Son and Thompson, 11, Aldersgate Street, E.C.	2	2	0
May, John, Garden Wharf, Battersea	0	10	6
Medcalf, E., Brixton, S.W.	0	10	6
Meggeson, George	1	1	0
Merrell, J., 1, Queen's Terrace, Camden Road, N.W.	1	1	0
Middleton, F., 338, Oxford St., W.	1	1	0
Mitchell, John, 254, Upper Street, Islington, N.	0	10	6
Morgan, D., 25, Brecknock Rd., N.	0	10	6
Mould, S., 21, Moorgate St., E.C.	1	1	0
Mundy, Alfred Octavius, 11, Norton Folgate, E.	0	10	6
Muter, John, 289, Kennington Rd.	3	3	0
New, W. W., 238, Essex Road, N.	0	10	6
Newzam, H. S., 40, Theberton St., Islington, N.	0	10	6
Nicholson, F., 216, St. Paul's Road, Highbury, N.	1	1	0
Northway, John, 27, Great Tower Street, E.C.	1	1	0
Orpe, T. M., 329, Old Kent Rd., S.E.	0	10	6
Owen, John, 234, Upper Street, Islington, N.	1	1	0
Palmer, R., 35, Ovington Sq., S.W.	1	1	0
Parker, J. D., 40, Aldersgate St.	0	10	6
Parkinson and Son, Southampton Row, W.C.	1	1	0
Penrose, A. W., 5, Amwell St., E.C.	0	10	6
Pidduck, John, Bridge Terrace, Harrow Road, W.	0	10	6
Plummer, George, 185, High Street, Peckham, S.E.	1	1	0
Pratt, E., 8, Upper Berkeley St., W.	1	1	0
Preston and Sons, 88, Leadenhall Street, E.C.	2	2	0
Price, J. M., 3, Loughborough Place, Brixton Road, S.W.	0	10	6
Quiller, C. R., 148, Sloane St., S.W.	0	10	6
Quinlan, J., Barnsbury Road, N.	0	10	6
R. H., 2, Bush Lane, E.C.	0	5	0
Radermacher, C. J., 6, Ellington Street, Islington, N.	1	1	0
Richardson, G., 12, Norland Place, Notting Hill, W.	0	10	6
Ringrose, George, 123, St. George's Street, E.	0	10	6
Roach, Pope, 8, St. James's St., S.W.	1	1	0
Robbins, John, and Co., 372, Oxford Street, W.	1	1	0
Rose, A., 441, Edgware Road, W.	0	10	6
Rouse, Fred. J., Clapham, S.W.	0	10	6
Rowe, R., South Kensington, S.W.	0	10	6
Rowntree, T., 1, Westbourne Road, Islington, N.	0	10	6
Rowson, H., 2, Chichester St., W.	0	10	6
Sadler, W., 15, Norton Folgate, E.	0	10	6
Sandford, G. W., 47, Piccadilly, W.	1	1	0
Sangster, A., 66, High Street, St. John's Wood, N.W.	1	1	0
Schacht, William, 6, Finsbury Place South, E.C.	0	10	6
Selleck, E., Apothecaries' Hall, E.C.	0	10	6
Shephard, Thos. F., 37, All Saints' Road, W.	0	10	6
Sheppard, A., 51, Hollywood Road, West Brompton, S.W.	0	10	6
Simpson, H., 5, Hanover Place, Regent's Park, N.W.	0	10	6
Slipper, J., 87, Leather Lane, E.C.	0	10	6
Smallfield, J. S., 10, Little Queen Street, W.C.	0	10	6
Smith, W., 2, Alfred Terrace, South Hackney, E.	0	10	6
Smith, William F., 280, Walworth Road, S.E.	1	1	0
Sparrow, W. C. F., 2, Ranelagh Terrace, S.W.	1	1	0
Spurling, William, 8, Stanley Road, Hackney, E.	0	10	6
Starkie, R. S., 4, Strand, W.C.	1	1	0
Stathers, J., 43, Norland Road, Notting Hill, W.	0	10	6
Steel, F. W., 2, Morgan's Place, Liverpool Road, N.	0	10	6
Steer, Philip R., 411, Mare St., E.	0	10	6
Stevenson, William L., 165, Edgware Road, W.	0	10	6
Stickland, W. H., South Kensington, S.W.	0	10	6
Stocken, J., 33, Euston Sq., N.W.	0	5	0
Stoneham, P., 45, Craven Rd., W.	0	10	6
Strawson, G. F., 101, High Holborn, W.C.	0	10	6
Suart, Benjamin, 14, Bath St., E.C.	1	1	0
Taplin, W. Gilbert, 75, Hampstead Road, N.W.	1	1	0
Taylor and Co., 10, Little Queen Street, W.C.	1	1	0
Taylor, T., High St., Peckham, S.E.	0	10	6
Taylor, Matthew, 6, Rye Lane, Peckham, S.E.	0	10	6
Thomas, Henry, 7, Upper St. Martin's Lane, W.C.	0	10	0
Thompson, G. A., 17, Archer St., Notting Hill, W.	0	5	0
Thompson, Henry A., 22, Worship Street, E.C.	1	1	0
Thompson, John, 11, Aldersgate Street, E.C.	1	1	0
Thorn, J. J., 338, Oxford St., W.	0	5	0
Tipping, T. J. W., 12, High Street, Stoke Newington	0	10	6
Titley, T., 44, Charlotte Street, Fitzroy Square, W.	0	10	6
Townsend, Charles, 40, Aldersgate Street, E.C.	0	10	6
Treloar, T., 67, Ludgate Hill, E.C.	0	10	6
Trotman, A. C., 16, Cambridge Street, W.	0	10	6
Tuck, W. H., 630, Mile End Rd., E.	0	10	6
Tugwell, W. H., 3, Lewisham Road, Greenwich, S.E.	0	10	6
Turner, Charles E., 63, Great Russell Street, W.C.	0	10	6
Umney, C., 40, Aldersgate St., E.C.	0	10	6
Vizer, Edwin B., 63, Lupus Street, Pimlico, S.W.	1	1	0
W. T. C.	0	10	6
Wallis, J. T. W., 49, Berners St., W.	0	5	0
Warner, Carter and Co., Charterhouse Square, E.C.	1	1	0
Warner, C. H., 55, Fore St., E.C.	1	1	0
Wastie, F., 183, Lower Kennington Lane, S.E.	0	10	6
Waugh, A., 177, Regent Street, W.	1	1	0
Weston, Samuel J., 151, Westbourne Terrace, W.	1	1	0
Westrup, J. B., 76, Kensington Park Road, W.	0	10	6
Whincup, W., 404, Essex Rd., N.	0	10	6
Whitburn, Augustus R., 174, Regent Street, W.	0	10	6
Whittle, E. C. C., Townsend Rd., St. John's Wood, N.W.	0	5	0
Wickham, William, 509, New Cross Road, S.E.	0	10	6
Wigg, Henry John, 338, Oxford Street, W.	0	10	6
Wilkinson, T., Regent Circus, W.	1	1	0
Williams, John, 10, New Cavendish Street, W.	1	1	0
Williams, J. J., 13, Desborough Place, Harrow Road, W.	0	10	6
Williams, R., 2, Gresham Place, East Brixton, S.W.	0	10	6
Willows, Jesse, 101, High Holborn	1	1	0
Wilson, T., Upper Holloway, N.	0	10	6
Wise, Walter, 43, Duke Street, Manchester Square, W.	1	1	0
Wood, Edward, 49, Berners St., W.	0	10	6
Wooldridge, J., 290, Euston Road	0	10	6
Wootton, William, 10, Mount Row, Liverpool Road, N.	0	10	6
Wretts, J. R., 338, Oxford St., W.	0	5	0
Wylde, George, 53, King's Road, Chelsea, S.W.	0	10	6
Wyman, John, 122, Fore St., E.C.	1	1	0
Young, George, 12, Ebenezer Terrace, Millwall, E.	0	5	0

SUBSCRIPTIONS.—COUNTRY.

	£.	s.	d.
Abergavenny, Ackrill, George	0	10	6
Abingdon, Ballard, Walter	1	1	0
" Preston, A. P.	0	10	6
Alfreton, Robinson, J. S.	0	5	0
Alnwick, Newbigin, James L.	1	1	0
Ampthill, Allen, George	0	10	6
Arbroath, Milne, P.	1	1	0
Ashbourne, Bradley, Edwin S.	0	10	6
Ashford, Ingall, Joseph	1	1	0
Atherton, Warburton, Thomas	0	5	0
Bala, Jones, Thomas	0	10	6
Banbury, Ball, George Vincent	0	10	6
Banff, Bartlett, Ellis	0	10	0
Barking, Fitt, Francis Edward	0	10	6
Barnet (New), Young, Robert F.	0	10	6
Barnstaple, Goss, Samuel	0	5	0
Barton-on-Humber, Ingoldby, W.	0	2	6
Basingstoke, Woodman, George	0	5	0
Bath, Davis, Barnitt and Co.	0	10	6
" Pooley, John Carpenter	0	5	0
" Rolfe, William A.	0	5	0
" Tylee, John P.	0	10	6
Beckenham, Day, Thomas S.	0	10	6
Bedford, Anthony, John Lilly	0	10	6
" Taylor and Cuthbert	0	10	6
Beechworth, Australia, Bryant, J.	0	10	6
Bennington, Long, Bemrose, John	0	10	6
Berkeley, Bell, Edward C.	0	10	6
Berwick, Carr, William Graham	0	10	6
" Davidson, John	0	10	6
Beverley, Richardson, John	0	2	6
" Robinson, James Mowld	0	5	0
Bewdley, Newman, Robert	0	10	6
Bickley, Garle, John	1	1	0
Bideford, Hogg, Thomas	0	5	0
Birkenhead, Reece, John	0	5	0
Birmingham, Churchill, John	0	10	6
" Clayton, Francis C.	1	1	0
" Foster, Alfred H.	0	5	0
" Lucas, Joseph	0	10	6
" Mantell, Charles	0	10	6
" Musson, Telemach. G.	0	10	6
" Palmer, Charles F.	0	10	6
" Pegg, Herbert	0	10	6
" Perry, William H.	0	5	0
" Robinson, Eirdley	0	10	6
" Snape, Edward	0	5	0
" Southall, Son and Dymond	1	1	0
" Sumner, John	1	1	0
Bishop Stortford, Speechly, G.	0	10	6
Blackheath, Lavers and Son	1	1	0
Blandford, Groves, Wellington E.	0	10	6
Bodmin, Williams, Joel D.	1	1	0
Bognor, Long, Alfred T.	0	10	6
Boston, Allen, Thompson	0	5	0
" Marshall, Robert	0	5	0
Boyton, Nunn, Charles G.	1	1	0
Bradford (Yorks.), Blackburn, B.	1	1	0
" Faull, John	1	1	0
" Harrison and Parkinson	2	2	0
" Hick, Joseph	0	10	6
" Rogerson, Michael and Son	2	2	0
Brentwood, Guest, E. P.	0	5	0
Bridge, Thomas, James	0	5	0
Bridgnorth, Steward, William	0	10	6
Bridlington, Cooper, Mark W.	0	5	0
Bridport, Beach and Barnicott	1	1	0
" Beach, James	0	10	6
" Tucker, Charles	0	10	6
Brighton, Barton, Charles	0	10	6
" Barton, Henry	0	10	6
" Brew, Thomas A.	0	10	0
" Cornish, William	0	5	6
" Else, William	0	10	6
" Foster, Frederick	0	10	6
" Glaisyer, Thomas	0	10	6
" Gwatkin, James Thomas	0	10	6
" Haffenden, Thomas	0	5	0
" Kemp, John	0	10	6
" Noakes, Richard	0	10	6
" Robson, Thomas	0	10	6
" Samuel, Edward	0	10	6
" Savage, William Dawson	0	10	6
" Savage, William W.	0	10	6
" Schweitzer, Julius	1	1	0
" Smith, Walter Henry	0	10	6
" Smith, William	0	10	6
Bristol, Ackerman, Theophilus	1	1	0
" Butler, Samuel	0	10	6
" Hatch, Isaac and Co.	1	1	0
" Hodder, Henry	0	5	0
" Margetson, James	0	10	6
" Sircom, Richard	0	10	6
" Stoddart, William W.	0	10	6
Bromley (Kent), Baxter, Wm. W.	0	10	6
" Shillcock, J. B.	0	10	6
Brompton, New, King, T. S.	0	10	6
" King, W. S.	0	10	6
Broseley, Stevens, John	0	10	6
Bruton, Hill, Richard	0	5	0
Brynmawr, Jones, A. M.	0	10	0
Buckingham, Sirett, George	0	10	6
" Sirett, George B.	0	10	6
Burslem, Blackshaw, Thomas	0	10	6
" Guest, George C.	0	2	6
Bury St. Edmund's, Hardwicke, J.E.	0	10	

	£.	s.	d.
Cambridge, Deck, Arthur	0	10	6
Canterbury, Amos, Daniel	0	10	6
,, Gardner, Austen W.	0	5	0
,, Harvey, Sidney	0	10	6
,, Paine, William	0	10	6
Cardiff, Coleman, E. J.	0	10	6
,, Drane, R.	0	5	0
,, Inglis, W. G.	0	2	6
,, Joy, Francis W.	0	10	6
,, Williams, Thomas	0	10	6
,, Yorath, C.	0	10	6
Carlisle, Hallaway, John	0	5	0
,, Moss, William	0	5	0
,, Sawyer, James	0	5	0
,, Thompson, Andrew	0	5	0
Carnarvon, Jones, John	0	5	0
Chatham, Crofts, Holmes Cheney	0	10	6
,, French, Gabriel	0	10	6
,, Tribe, John	0	10	6
Chelmsford, Baker, Charles P.	0	10	6
,, Baker, Garrad	0	10	6
,, Seaton, George	1	1	0
,, Tomlinson, James	1	1	0
Cheltenham, Butcher, Thomas	2	2	0
,, Fletcher, Francis	0	10	6
,, Palmer, Faithful	0	10	6
,, Proctor and Forth	1	1	0
Chertsey, Boyce, George	0	5	0
Chester, Hodges, William	1	1	0
Chew Magna, Milton, Thomas	0	2	6
Chichester, Long, William E.	0	10	6
,, Pratt, John	0	10	6
Chipping Ongar, Chapman, R. J.	0	10	6
Cirencester, Smith, Charles S.	1	1	0
Cockermouth, Bowerbank, Joseph	1	1	0
Colchester, Chaplin, John L.	0	5	0
,, Cole, Frederick A.	0	5	0
,, Manthorp, Samuel	0	5	0
,, Prosser, Evan T.	0	5	0
,, Shenstone, James B.	0	5	0
Colsterworth, Wing, Samuel W.	0	10	6
Coningsby, Brown, Samuel	0	5	0
Cottingham, Lister, George	0	10	6
Coventry, Hinds, James	0	10	6
Crewkerne, Pearce, Joseph	0	5	0
Crickhowell, Christopher, William	0	5	0
Crook, Wilson, Isaac	0	10	0
,, Wilson, James	0	10	0
Croydon, Blake, Charles	0	10	6
,, Long, Henry	0	10	6
,, Stannard, Frederick J.	0	5	0
Deal, Green, John	0	10	0
Denbigh, Edwards, William	0	5	0
Devizes, Madge, James C.	0	10	6
Diss, Cupiss, Francis	0	10	6
,, Gostling, Thomas P.	0	5	0
,, Smith, Thomas W.	0	5	0
,, Thrower, Edward A.	0	10	6
Doncaster, Howorth, James	0	10	6
Dorking, Clark, W. W.	0	10	6
Dover, Bottle, Alexander	1	1	0
,, Forster, Robert	0	10	6
,, Forster, Robert Henry	0	5	0
,, Hambrook, John B.	0	5	0
Driffield, Great, Elgey, James	0	10	0
Dudley, Dennison, Matthew	0	5	0
,, Hollier, Elliott	0	10	6
Durham, Burdon, John	0	10	6
,, Rollin, John George	0	10	6
,, Sarsfield, William	0	10	6
,, Wortley, John	0	10	6
Ealing, Barry, Thomas	0	10	6
,, Hayles Brothers	1	1	0
Eastbourne, Hall, Samuel	0	10	6
Edinburgh, Aitken, James	0	5	0
,, Aitken, William	0	10	6
,, Baildon, H. C.	1	1	0
,, Brown, D. R.	1	1	0
,, Buchanan, James	1	1	0
,, Duncan, Flockhart and Co.	1	1	0
,, Leitch, William	0	10	6
,, Macfarlane, A. Y.	0	5	0
,, Macfarlan, J. F. and Co.	2	2	0
,, Mackay, John	1	1	0
,, Raimes, Blanshard and Co.	1	1	0
,, Robertson, James	0	10	0
Edmonton, Lower, Jefferson, T.	0	10	6
Eton, Bingham, William H.	0	10	6
,, Lewis and Son	1	1	0
Exeter, Bromfield, Charles	0	5	0
,, Cooper, George	0	10	6
,, Husband, Matthew	0	10	6
,, Napier, George L.	0	5	0
,, Palk, John	0	10	6
Exeter, Stone, John	0	5	0
Fairford, Manning, Henry	0	5	0
Falkirk, Murdoch, David	0	10	6
Fareham, Batchelor, Charles	0	5	0
,, Peat, Walter	0	10	6
Farnham, Crook, George	0	10	6
,, Walton, George C.	0	10	6
Flint, Jones, Michael	0	10	6
Florence, Groves, Henry	1	1	0
Fordingbridge, Haydon, Fredk. W.	0	5	0
Forest Hill, Furze, Mrs. H.	0	10	6
,, Simpson, T.	0	5	0
Fowey, Wellington, James	0	2	0
Gainsborough, Marshall, J. Ferris	0	10	6
Gateshead, Elliott, Robert	0	10	6
,, Garbutt, Cornelius D.	0	10	6
Glasgow, Currie, John, 311, Sauchiehall Street	0	5	0
,, Jaap, John	0	10	6
,, Kinninmont, Alexander	0	10	6
Gloucester, Berry, Edward	0	5	0
,, Stafford, William	0	5	0
Goole, Hasselby, Thomas John	0	5	0
Gosport, Hunter, John	0	5	0
,, Mumby, Charles	0	10	6
Grantham, Hall, Thomas	0	10	6
,, Newcome, John	1	1	0
Gravesend, Beaumont, William H.	1	1	0
,, Spencer, Charles	1	1	0
Greenwich, Brown, A. J.	0	10	6
Grimsby, Great, Cook, Robert	0	10	6
Guildford, Martin, Edward W.	0	10	6
,, Shepherd, Geo. Prentis	1	1	0
Guisborough, Graham, T. R.	0	10	0
Halstead, Evans, Daniel Ogilvie	0	10	6
Harleston, Muskett, James	0	10	6
,, Parker, Henry Walter	2	2	0
Harrogate, Coupland, Joseph	0	10	6
,, Greenwood, Charles	0	5	0
,, Greenwood, John	0	10	6
,, Taylor, Joseph H.	0	10	6
Harwich, Bevan, Charles F.	0	10	6
Hastings, Bell, James A.	0	10	6
,, Miller, Frederic	1	1	0
,, Rossiter, Frederic	0	10	6
Haverfordwest, Saunders, D. Price	0	10	6
Hawkhurst, Stainburn, Joseph	1	1	0
Hay, Davies, John L.	0	5	0
Heavitree, Brailey, Charles	0	5	0
Heckmondwike, Booth, John	1	1	0
,, "No Name"	0	2	6
Hedon, Soutter, Messrs.	0	10	6
Hertford, Lines, George	0	10	6
Heywood, Beckett, William	0	10	6
Hirwain, Sims, Joseph	0	10	6
Holbeach, Curtis, Thomas W.	0	10	6
Honiton, Turner, George	0	10	6
Horsham, Jull, Thomas	1	1	0
,, Williams, Philip	0	10	6
Horton, Great, Lister, S.	0	10	6
Howden, Saville, John	1	1	0
Huddersfield, Fryer, Henry	0	10	6
,, King, William	0	10	6
,, Higgins, Tom S.	0	10	6
Hull, Akester, Joseph C.	0	2	6
,, Allison Brothers	1	1	0
,, Anholm, August	0	10	6
,, Balk and Shepherdson	0	5	0
,, Barlow, George	0	5	0
,, Baynes, James	0	10	6
,, Bell, Charles B.	0	10	6
,, Briggs, George Jeremiah	0	5	0
,, Cottingham, Kirk	0	5	0
,, Des Forges, Joseph Henry	0	5	0
,, Dixon, Joseph	0	5	0
,, Dobson, John B.	0	5	0
,, Dyson, George	0	5	0
,, Earle, Francis	1	1	0
,, Escreet, James	0	5	0
,, Fisher, John R.	0	5	0
,, Gibson, Charles P.	0	10	6
,, Green, Alfred	0	5	0
,, Grindall, William	0	5	0
,, Grindell, John	0	10	6
,, Hall, Henry R. F.	0	5	0
,, Hammond, Charles T.	0	10	6
,, Hart, George William	0	5	0
,, Hollingsworth, James	0	5	0
,, Jubb, Edward	0	2	6
,, Kellington, Mark L.	0	2	0
,, Kirton, Joseph B.	0	10	6
,, Milner, John George	0	5	0
,, Myers, George	0	10	6
,, Preston, John	0	5	0
,, Smith, Anthony	0	10	6
,, Staning, William	0	5	0
Hunstanton, Twiss, W.	0	10	6
Ipswich, Cornell, William	1	1	0
Jedburgh, Rawdin, J.	0	5	0
Jersey, Millais, Thomas	1	1	0
Kaffraria, Daines, Thomas	0	10	6
Kendal, Severs and Bateson	1	1	0
Kidderminster, Bond, Charles	0	10	6
Kilmarnock, Borland, John	0	10	6
,, Rankin, William	1	1	0
Landport, Tryon, William G.	0	5	0
Langholm, Rome, Robert M.	0	5	0
Leamington, Barnett, John	0	10	6
,, Davis, Henry	0	10	6
,, Jones, Samuel Urwick	0	10	6
,, Leath and Woolcott	0	10	6
,, Pullin, William H.	0	10	6
Leatherhead, Hewlins, Edward	0	10	6
Leeds, Bilbrough, J. B.	0	10	6
,, Brooke, Thomas	0	10	6
,, Goodall, Backhouse and Co.	1	1	0
,, Harvey, Thomas	1	1	0
,, Hirst, James Andus	0	10	6
,, Jefferson, Peter	0	5	0
,, Metcalfe, Edmund Henry	0	10	6
,, Reynolds, Freshfield	0	10	6
,, Reynolds, Richard	1	1	0
,, Sagar, Henry	0	5	0
,, Smeeton, William	0	10	6
,, Taylor and Fletcher	1	1	0
,, Yewdall, Edwin	0	10	6
Lees, Marlor, Jabez	0	10	6
Leicester, Clarke, Walter B.	0	5	0
,, Cooper, Thomas	0	10	6
,, Harvey, William R.	0	5	0
,, Salisbury, William Bryan	0	10	6
Leith, Wilson, James	1	1	0
Leominster, Davis, D. Frederick	1	1	0
Lewes, Head, John	0	10	6
,, Martin, Thomas	0	10	6
,, Saxby, Henry	0	10	6
Lewisham, Clift and Crow	1	1	0
Lincoln, Tomlinson, Charles K.	0	10	6
Liverpool, Barber, George	0	10	6
,, Coupland, Henry	0	5	0
,, Fergusson, John	1	1	0
,, Hunt, Thomas	0	10	6
,, Jones, Owen Lewis	0	10	6
,, Maskery, Samuel	1	1	0
,, Parkinson, Richard	0	5	0
,, Pheysey, Richard	1	1	0
,, Tanner, A. E.	0	10	6
,, Utley, Alfred	0	5	0
Llandilo, Levi, R. G.	0	2	0
Llangollen, Jones, Humphrey	0	5	0
Looe, Hicks, James S.	0	10	6
Loughborough, Paget, John	0	5	0
Louth, Hurst, John	0	10	6
,, Simpson, Henry D.	0	10	6
Lowestoft, Edmonds, Benjamin M.	0	5	0
Ludlow, Cocking, George	0	5	0
Lydney, Smith, J.	0	10	0
Lye (Stourbridge), Jones, R. G.	0	5	0
Lymington, Allen, Adam U.	0	5	0
Macduff, Henry, Andrew	0	5	0
Maidstone, Rogers, William	0	10	6
Malvern, Great, Burrow, Messrs.	1	1	0
Malvern Link, Gwillim, John Cole	0	10	6
Malvern Wells, Wakefield, Cecil H.	1	1	0
Manchester, Benger, F. Baden	0	5	0
,, Brown, William Scott	1	1	0
,, Carter, William	0	10	6
,, Halliday, W. J.	0	10	6
,, Hampson, Robert	0	10	6
,, Jackson, Thomas	0	10	6
,, Johnstone, Charles A.	0	10	6
,, Leete, W. W.	0	10	6
,, Maunder, Robert	0	10	6
,, Mitchell, John	0	10	6
,, Mumbray, H. G.	0	10	6
,, Paine, Standen	0	5	0
,, Ransome, Thomas	0	10	0
,, Ritson, John	0	5	0
,, Terry, Thomas	0	5	0
,, Walsh, Edward	0	10	6
,, Wilkinson, George	0	10	6
,, Wilkinson, William	0	10	6
,, Woolley, James	2	2	0
,, Wright and Barnaby	1	1	0
Margate, Wootton, E. and Sons	0	10	6
Market Drayton, King, William G.	1	1	0
Maryport, Cockton, John	0	5	0
Melton Mowbray, Leadbetter, W. A.	0	5	0
Merthyr Tydfil, Thomas, Rees	0	5	0
Mexboro', Greaves, E.	0	10	6

	£.	s.	d.
Middlesboro', Hudson, John Wm.	0	10	6
,, Smith, C. Simpson	0	5	0
,, Taylor, H. H.	0	10	6
,, Taylor, W. J.	0	10	6
,, Taylor, W. R.	0	5	0
Middleton-on-Tees., Marsden, Mgt.	0	5	0
Montreal, Mercer, Nathan	0	10	6
Narberth, Jones, David	0	5	0
Needham Market, Harrington, A.	0	10	6
Nether Stowey, Ham, John	1	1	0
Netley, Borchert, Heinrich, T. G.	0	10	6
Newcastle-on-Tyne, Brady, H. B.	1	1	0
,, ,, Mann, R.	0	10	6
,, ,, Potts, Thomas	0	10	6
,, ,, Proctor, B. S.	1	1	0
Newcastle-under-Lyne, Cartwright, William	0	10	6
Newport (Mon.), Pearman, Henry	0	10	6
,, ,, Phillips, John	0	10	6
,, ,, Young, John	0	10	6
,, *(Salop)*, Picken, T. W.	0	10	6
Newton Abbot, Poulton, John	0	10	6
Newtown, Morgan, Richard	0	10	6
Northallerton, Warrior, William	0	10	6
Northampton, Barry, James	1	1	0
,, Mayger, William D.	0	10	6
Norwich, Arnold, Edward	0	5	0
,, Caley, Albert J.	0	10	6
,, Cooke, William	0	5	0
,, Sutton, Francis	0	10	6
,, Woodcock, Page D.	0	10	6
Norwood, Upper, Birch, Henry C.	1	1	0
Nottingham, Jenkins, Joseph	0	10	6
Oakham, Wellington, James Martin	0	10	6
Odiham, Hornsby, John H.	0	10	6
Oldbury, Briggs, George	0	10	6
Oldham, Bagshaw, William	0	10	6
,, Bates, Henry	0	10	6
,, Hargraves, Henry L.	0	10	6
,, Heathorn, Joshua	0	10	6
Ore (Hastings), Neve, Francis C.	0	10	6
Oswestry, Vaughan, David	0	10	6
Otley, Pratt, Richard Munton	0	10	6
Oxford, Hitchcock and Sons	1	1	0
,, Houghton, Thomas	0	10	6
,, Prior, George T.	0	10	6
Peterboro', Loveridge, Thornal P.	0	5	0
Petherton, S., Wellington, F. G. N.	0	5	0
Pillgwenlly, Morgan, William	0	5	0
Plymouth, Balkwill, Alfred Payne	0	10	6
,, Burdwood, James	0	5	0
,, Northcroft, Jonathan	0	5	0
,, Sloggett, Thomas C.	0	2	6
Pontypridd, Bassett, Charles	0	10	6
Portobello, Kemp, David	0	10	6
Portsmouth, Parsons, William	0	10	6
,, Pasmore, George	0	10	0
Preston, Hogarth, William	0	10	6
,, Oakey, Joseph Malpas	0	10	6
Putney, Farmer, John	0	5	0
,, Jeffcoat, —	0	5	0
,, Jones, Thomas	0	5	0
Ramsgate, Fisher, Charles, and Sons	2	2	0
,, Morton, Henry	0	5	0
Retford, Baker, William	0	10	6
Rhyl, Foulkes, W. H.	0	10	6
,, Jones, E. Powell	0	10	6
Richmond (Surrey), Hopwood and Son	1	1	0
,, ,, Clarke, T. M.	0	10	6
Richmond (Yorks.), Thompson, T.	0	10	6
Rochdale, Booth, James	1	1	0
,, Lord, Ellis	0	5	0
,, Taylor, Edward	0	5	0
,, Whitehead, John	0	5	0
Rochester, Barnaby, Henry	0	10	0
,, Harris, H. W.	0	10	6
Rock Ferry, Dutton, John	1	1	0
Romford, Lasham, J. W.	0	10	0
,, Pertwee, Edward	1	1	0
Rotherham, Booth, Nathaniel	0	10	6
Rothesay, Duncan, William	0	5	0
,, Macintosh, Archibald	0	5	0
Rothiemay-by-Huntly, Pirrie, C.	0	5	0
Rugby, Garratt, John C.	0	5	0
,, Garratt, Samuel	0	5	0
,, Lewis, Thomas C.	0	10	6
Ryde, Dixon, Henry	0	10	6
,, Gibbs, William	0	10	6
,, Taylor, Richard	0	10	6
,, Wavell, John	0	10	6
Rye, Smith, Alfred W.	0	10	6
,, Waters, William A.	0	10	6
Saffron Walden, Machon, Henry	0	10	6

	£.	s.	d.
St. Alban's, Martin, Henry G.	0	10	6
,, Roberts, Albinus	1	1	0
St. Asaph, Roberts, Peter	0	10	6
St. Austell, Geldart, John	0	5	0
St. Day, Corfield, Charles	0	10	6
,, Corfield, Thomas J. T.	0	10	6
St. Leonard's-on-Sea, Maggs, S. B.	1	1	0
Salford, Manfield, John W.	0	5	0
Salisbury, Atkins, Samuel Ralph	0	10	6
Saltash, Mathew, William Ham	0	4	0
Scarborough, Smart, John	0	10	0
,, Whitfield, John	1	1	0
Seacombe, Holt, Richard Wylde	0	5	0
Selby, Colton, Thomas	0	2	6
,, Cutting, Thomas J.	0	2	6
,, Glew, William	0	2	6
Shanklin, Lasham, John	0	10	0
Sheffield, Ellinor, George	0	10	6
,, Hudson, F.	0	10	6
,, Jennings, John E. H.	0	10	6
,, Maleham, Henry	0	10	6
,, Priestley, Henry	0	10	6
,, Radley, William V.	0	10	6
Shepherd's Bush, Bird, Augustus	2	2	0
,, Jones, William	0	5	0
Shefford, Baigent, William H.	0	10	6
Shields, South, Forrest, Robert	0	10	6
,, Mays, Robert J. J.	0	10	6
Shrewsbury, Blunt, Son and Co.	1	1	0
,, Cross, William Gowen	0	10	6
,, Cross, W. Gowen, jun.	0	10	6
,, Edwards, William	0	10	6
,, Salter, J. B.	0	10	6
Sidmouth, Chessall, Rowland	0	10	6
Sittingbourne, Gordelier, P. W. G.	1	1	0
,, Rook, Edward	0	10	6
Sleaford, Heald, Benjamin	0	10	6
Slough, Griffith, Richard	0	10	6
Southampton, Palk, Edward	1	1	0
,, Randall, William B.	1	1	0
Southport, Ashton, William	0	5	0
,, Garside, Thomas	0	10	6
,, Sykes, Thomas Hindle	0	10	6
,, Walker, William H.	0	10	6
Southsea, Cruse, Thomas H.	0	10	6
,, Hackman, Leonard L.	0	10	6
,, Rastrick and Son	0	10	6
Sowerby Bridge, Stott, William	0	10	6
Spalding, Asling, Brelsford	0	5	0
,, Swift, Francis	0	10	6
Spennymoor, Prudhoe, R.	0	10	6
Spilsby, Rainey, Edward	0	10	6
Stafford, Averill, Henry A.	1	1	0
,, Averill, John	1	1	0
Staines, Jones, Edward George	0	5	0
Steyning, Goodwyn, Charles S.	0	5	0
Stockport, Shaw, Alexander Henry	1	1	0
Stockton-on-Tees, Bainbridge, R. R.	0	2	6
,, Brayshay, Thos.	0	10	6
,, Brayshay, W. B.	1	1	0
,, Clark, William	0	2	6
,, Hodgson, Edw.	1	1	0
,, Hodgson, E., jun.	0	10	6
Stony Stratford, Cox, Mrs.	0	10	6
Stourbridge, Bland, John H.	0	10	6
,, Burgess, William	0	5	0
,, Hughes, Samuel	0	10	6
,, Loverock, Henry	0	5	0
,, Morris, Alfred Philip	0	10	6
,, Perks, Francis	0	10	6
,, Whitwell, George	0	5	0
Stowmarket, Simpson, T., and Son	0	5	0
,, Sutton, Chas. William	0	5	0
Stratford, Holford, Thomas C.	0	10	6
,, Howard and Sons	2	2	0
Stratford-upon-Avon, Wynne, E.P.	0	10	6
Streatham, Robinson, Charles	0	10	6
Strood, Picnot, Charles	1	1	0
Stroud, Coley, Samuel J.	0	10	6
Sunbury, Leare, James	0	5	0
Sunderland, Nicholson, John J.	0	10	6
Sutton Coldfield, Smith, William	0	10	6
Swansea, Finch, Albert H.	0	10	6
Sydenham, Harris, Daniel R.	0	10	6
,, Holloway, Thomas H.	0	10	6
,, Lang, William	1	1	0
,, Pocklington, James	0	10	6
,, J. M. W.	0	2	6
Taunton, Evans, J. J.	0	5	0
,, Fouracre, Robert	0	10	6
,, Gregory, George Henry	0	5	0
,, Hambly, Charles J.	0	10	6
,, Kirkman, Charles J.	0	5	0
,, Kirkpatrick, Samuel	0	5	0
,, Pearse, John	0	5	0
,, Prince, Henry	0	10	6

	£.	s.	d.
Taunton, Redman, Sidney	0	5	0
Tenterden, Willsher, S. H.	0	10	6
Thirsk, Thompson, John	0	10	6
Thornton-in-Craven, Wilson, Thos.	1	1	6
Tickhill, Crowther, Thomas	0	10	6
Tiverton, Norrish, Henry	0	10	6
Todmorden, Lord, Charles	1	1	0
Tonbridge, Millidge, T. E.	0	10	6
Torpoint, Down, Richard H.	0	10	6
Tottenham, Bently, William J.	0	10	6
Trimpley, Steward, Josiah	0	10	6
,, Steward, Theophilus	0	10	6
Troedyrhiw, Jones, Wm.	0	5	0
Tunbridge Wells, Delves, George	0	10	6
,, Gardener, Chas.	0	10	6
,, Howard, Richard	0	10	6
,, Sells, Robert Jas.	0	10	6
,, Sissmore, H. T.	0	10	6
Tweedmouth, McIntyre, P. S.	0	5	0
Twickenham, Bishop, Thomas	0	10	6
Uttoxeter, Johnson, John B.	0	10	6
Wakefield, Duffin, Thomas	0	10	6
,, Romans, Thomas W.	0	10	6
,, Taylor, John	0	10	6
Wallingford, Payne, S.	1	1	0
Walmer, Peake, Robert	0	10	6
Walsham-le-Willows, Wilson, T.	0	5	0
Waltham Abbey, Marshall, J. A.	0	10	6
Walton-on-Thames, Power, Edw.	0	10	6
Wandsworth, Bolton, H. N.	1	1	0
,, Nind, George	0	10	6
Wandsworth, New, Crosby, James	0	10	6
Warrington, Robinson, John T.	0	2	6
Watford, Chater, J., and Son	1	11	6
,, Oldfield, Henry	0	10	6
Weaverham, Manifold, John J.	0	10	6
Wellingborough, Thorne, John	0	10	6
Wellington, Langford, John B.	0	10	0
Welwyn, Lawrance, Edmund	0	11	0
Westbury, Taylor, Stephen	0	5	0
West Hartlepool, Cooper, S. H.	1	1	0
,, Davison, John	5	5	0
Weymouth, Groves, T. B.	0	10	6
Winchcombe, Howman, Philip	0	5	0
Winchester, Powell, Edward	1	1	0
Windsor, Boyce, John P.	0	10	6
,, Collins, H. G.	0	5	0
,, Crook, Edward	0	10	6
,, Grisbrook, Edward	0	10	6
,, Leigh, John	0	10	6
,, Russell, Charles J. L.	0	10	6
,, Weller, George	0	10	6
,, Wetherhead, E.	0	10	6
Woolwich, Parkes, John C.	0	10	6
,, Rastrick, John A.	0	10	6
Worcester, Twinberrow, John	1	1	0
,, Whitfield and Sons	1	1	0
,, Witherington, Thomas	1	1	0
Wrexham, Paine, Charles	0	10	6
Wyke, Drake, William	0	2	0
Wymondham, Skoulding, William	0	5	6
Yarm, Reed, George	0	10	6
Yarmouth, Great, Walpole, Wm.	0	10	6
Yeovil, Manning, Thomas D., jun.	1	1	0

DONATIONS.—LONDON.

	£.	s.	d.
Bourdas, Isaiah, 7, Pont St., S.W.	2	2	0
Coles, Charles, The Executors of	19	19	0
Good, Thomas, 47, Minories, E.	1	1	0
Mann, Edward, 7, Pall Mall East	10	10	0
Paul, Dr. B. H., 17, Bloomsbury Sq.	5	5	0
Rutter, Edmund Yates, 35, Moorgate Street, E.C.	2	2	0
Stooke, Arthur, 217, Edgware Road	5	5	0

COUNTRY.

	£.	s.	d.
Abingdon, Smith, William	1	1	0
Bromley, Saunders, Charles J. H.	5	5	0
Edinburgh, per Mr. John Mackay, balance of money collected in Edinburgh in connection with the British Pharmaceutical Conference Meeting	3	13	4
Glasgow, Finger, Daniel	2	2	0
,, Murdoch Brothers	0	10	6
Hendon, Goldfinch, George	5	5	0
Hull, Hudson, John	2	2	0
Oundle, Roper, Henry Edward	0	10	0
Point de Galle, Bisset, George MacRitchie	2	10	0
West Hartlepool, Davison, John	5	5	0

RELIEF GRANTED DURING THE YEAR 1871.

				£.	s.	d.
11 Annuitants, each receiving £30 per annum				330	0	0
One quarter's annuity, to Lady Day (*annuitant now deceased*)				7	10	0
Two months' payment to Christmas to two Annuitants, elected October, 1871				10	0	0
				347	10	0
Registered Chemist and Druggist at Leicester, age 73 (second grant)	£5	0	0			
Member, late residing in Sussex, age 61	12	0	0			
Registered Chemist and Druggist, at Sheffield, aged 64	10	0	0			
Widow of a late annuitant, age 63	10	0	0			
Orphan daughter of a late Member at Southampton (fourth grant)	10	0	0			
Widow of a late Member at Bromyard, age 50	20	0	0			
Widow of a late annuitant, age 63 (second grant)	10	0	0			
				77	0	0
				£424	10	0

List of Annuitants elected, and date of Election.

				Age when elected.
David Peart	elected	October,	1865	68
Charlotte Goldfinch (Widow)	"	"	"	60
William Jacobs Froom	"	"	1866	64
Thomas Novis	"	"	"	66
Elizabeth Jones (Widow)	"	"	1867	55
John Rogers	"	"	"	58
Richard Trumper (*died Jan.* 1871)	"	"	1868	61
James Wick	"	"	"	66
Mary Gilkes (Widow)	"	"	1869	55
Martha Jane Farrow (Widow)	"	"	"	62
Charles Thomas Anderson	"	"	1870	64
Hannah Greaves (Widow)	"	"	"	77
Sarah Wilson (Widow)	"	"	1871	63
John Watkins	"	"	"	67

Cheques or P. O. Orders may be made payable to ELIAS BREMRIDGE, Secretary, 17, Bloomsbury Square, London, W.C.

Provincial Transactions.

MIDLAND COUNTIES CHEMISTS' ASSOCIATION.

Second General Meeting; Mr. G. DYMOND, President, in the chair.

Mr. HENRY W. JONES read a paper to the Associates on "Volumetric Analysis." Time not allowing the lecturer to complete his experiments, the PRESIDENT proposed that Mr. Jones should attend another evening for this purpose; he will therefore read a second paper on the same subject.

Third General Meeting.—Mr. J. B. WILLIAMS read a paper on "The Attractions of the Study of Botany." After dwelling at some length on its fascinations, Mr. Williams entered somewhat minutely into the different systems of the various botanical authorities. In the course of the discussion which took place afterwards, it was suggested that if the Association could arrange for members or students attending the Botany Classes to visit the Botanical Gardens, it would be of great assistance to them.

The next paper will be read on Thursday, January 25th, in the rooms of the Association, 24, Quadrant, New Street, Birmingham.

Parliamentary and Law Proceedings.

POISONING OF TWO CHILDREN BY A "SLEEPING MIXTURE."

The *Huddersfield Examiner* reports the death of two children, from the improper administration of a "sleeping mixture," prepared by the children's mother. It states that the children, who were twins six weeks of age, appeared to be suffering from pains in the stomach that caused them to scream a great deal, and the mother was recommended by a neighbour to try a decoction of opium and aniseed. The neighbour obtained the ingredients and gave them to the mother, without any instructions as to the quantity to be prepared or taken. The mother, having made a decoction, gave about two teaspoonfuls of it to one of the children. Late in the evening the child became very ill, and about half-past nine it died, it is supposed from the effects of the decoction that had been administered to it. She had also given some of it to the other child, and next morning it became so very ill that Mr. Goodall, surgeon, of Lockwood, was called in, and prescribed for it. The child died about three o'clock on Monday morning, from the same cause as its twin sister. It is stated that the box containing the opium, which was given to the neighbour, had no label upon it, nor were there any directions as to its use. This will doubtless be matter for inquiry at the inquest which will have to be held.

Obituary.

DR. LE CANU.

We have received information of a loss to French pharmacy in the person of Dr. Louis-René Le Canu, who died in Paris on the 19th of December, at the age of seventy-one years. The deceased gentleman was a Member of the Academy of Medicine, Professor at the École Supérieure de Pharmacie of Paris, Member of the Hygienic Council for the Department of the Seine, etc. He was also a member of several learned societies, and an officer of the Legion of Honour and of some foreign orders.

The contributions to scientific literature by Dr. Le Canu have been very numerous. Among them may be mentioned several memoirs upon the chemical constitution of blood, urine, milk and fat; an 'Analytical Examination of Hermodactyls,' 'Report on the Vegetable Alkaloids,' 'The Adulterations of Flours,' 'An Examination of a Mineral imported from America, containing Borate of Soda and Borate of Lime,' 'A Chemical Examination of Castor Oil,' 'A Complete Course of Pharmacy,' etc. He was also the author of some papers in conjunction with Messrs. Blachet, Bussy, Planche, Serbat, and others.

CHARLES SIDEY, L.R.C.S. EDIN.

Edinburgh has lost an able practitioner and a public-spirited townsman in Mr. Charles Sidey, who died at his residence in Hanover Street on Wednesday, the 27th ult. Mr. Sidey began his professional career as a chemist and druggist in the vicinity of Holyrood. In this capacity he qualified himself for the diploma of the Royal College of Surgeons, which he took in 1817. Entering immediately thereafter on general practice, he rapidly acquired the confidence and support of a large *clientèle* of patients, and was especially esteemed for his sagacity and skill in treating the diseases of children. He was much respected by his brother practitioners, and enjoyed the personal friendship and professional intercourse of Abercrombie, Alison and Syme. The last-named gentleman in particular, during the illness that ultimately carried him off, consulted Mr. Sidey regularly as to the nature of his malady. For more than half a century Mr. Sidey continued to maintain the confidence he had so deservedly won from the community, and his hale and vigorous bearing seemed to give promise of many years of active life in store for him. But suddenly, on the morning of the 27th ult., he was seized with a spasm of the heart, became insensible, and never rallied. He was in his seventy-sixth year, and leaves, among several sons and daughters, Dr. James Sidey, well-known in Edinburgh, not only for professional proficiency, but for very considerable talent as a writer of humorous and satirical songs.

MR. JOHN LESSEY.

We regret to announce the death, on the 22nd of December, of Mr. John Lessey, pharmaceutical chemist, of Croom's Hill, Greenwich. The deceased gentleman had for many years been connected with the Pharmaceutical Society, having joined it in 1852 as one of the Founders.

MEETINGS FOR THE ENSUING WEEK.

TUESDAY, Jan. 9. ......*Royal Institution*, at 3 P.M.—"Ice, Water, Vapour and Air." By Professor Tyndall.
Photographic Society, at 8 P.M.

THURSDAY, Jan. 11. ......*Royal Society*, at 8.30 P.M.
London Institution, at 4 P.M.—"The Philosophy of Magic." By J. C. Brough.

FRIDAY ....*Quekett Club*, at 8 P.M.

SATURDAY......*Royal Botanic Society*, at 3.45 P.M.

BOOKS RECEIVED.

ON FLUID MEAT: a New Preparation of Meat, especially adapted to Weak Stomachs and for Invalids generally, with Remarks on Food. By STEPHEN DARBY, F.C.S., Pharmaceutist. London: Churchills.

YEAR-BOOK OF PHARMACY: comprising Abstracts of Papers relating to Pharmacy, Materia Medica and Chemistry contributed to British and Foreign Journals from July 1, 1870, to June 30, 1871. With the Transactions of the British Pharmaceutical Conference at the Eighth Annual Meeting held at Edinburgh, Aug. 1871. London: Churchills. 1871.

DE L'ACONITINE CRISTALLISÉE ET DES PRÉPARATIONS D'ACONIT: ÉTUDE CHIMIQUE ET PHARMACOLOGIQUE. Par H. DUQUESNEL, Pharmacien de 1re Classe, membre de la commission d'hygiène publique et de salubrité du Xe arrondissement. 38 pages. Paris: J. B. Baillière et Fils. 1872.

REPORT OF THE SANITARY COMMITTEE TO THE COMMISSIONERS OF SEWERS OF THE CITY OF LONDON ON SPURIOUS AND UNSOUND TEA AND THEIR PROCEEDINGS THEREON. London: Ordered to be printed by the Commissioners. 1871.

The following journals have been received:—The 'British Medical Journal,' Dec. 30; the 'Medical Times and Gazette,' Dec. 30; the 'Lancet,' Dec. 30; the 'Medical Press and Circular,' Jan. 3; 'Nature,' Dec. 30; the 'Chemical News,' Dec. 30; 'English Mechanic,' Dec. 29; 'Gardeners' Chronicle,' Dec. 30; the 'Grocer,' Dec. 30; the 'Journal of the Society of Arts,' Dec. 23; 'British Journal of Dental Science' for January; the 'Florist and Pomologist' for January.

COMMUNICATIONS, LETTERS, etc., have been received from Dr. De Vry, Mr. J. Mason, Mr. E. Rice, Mr. Pocklington, "Unitas," "Ferrum," "Gignosko."

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

SYRUP OF TOLU.

Sir,—Your correspondent Mr. Goodwin Mumbray has evidently misunderstood the purport of my paper upon syrup and resin of tolu, there being in it no question as to the method of preparing the syrup; it points to what takes place during the process, and the employment of the residual resin. I would not trespass upon your space, but I fear your correspondent's letter may in another way tend to mislead. He writes, "It will occur to any practical chemist and druggist that the ordinary syrup of balsam (formerly Syr. Tolutani, Ph. Lond.) is made by adding ℥j Tr. Tolu to 2 simple syrup." As far back as 1745–1788, and again in 1809, and I believe in every subsequent Ph. Lond., the mode of preparing the syrup was identical with the present; in the Dublin Pharmacopœia, 1850, the same process was adopted, the Edinburgh Pharmacopœia being then the only one, as far as Great Britain was concerned, which ordered the tincture in making the syrup. Upon the construction of the P.B., the London form was chosen for adoption. Undoubtedly some did follow, and possibly may now, the ready mode of preparing the syrup by means of the tincture, but it was not, and is not, the process of the Ph. Lond. or the P. B., neither so pleasant to the taste nor so sightly. Either your correspondent or the printer, most likely the latter, has made a mistake as to proportions;* for, when the tincture was used by the Edinburgh or Dublin Colleges, it was in the proportion of ℥j of tincture to a pound and a half or two pounds of syrup, and not ℥j Tr. Tolu to 2 simple syrup. The proper quantity of syrup is evidently omitted. The balsam, dissolved in spirit and minutely divided by the syrup, might yield an article which would not cause the same effect as the undissolved crystalline substance properly directed to be separated by filtration when cold.

I have never seen a clear bright syrup made with the tincture, but, following the directions of the P. B. process, and which I believe to be the best, no difficulty need be experienced by any one in producing a good-flavoured and bright syrup.

With respect to the compound tincture of benzoin, or Friar's balsam, the old folks, as mentioned, have faith in it, and for other maladies besides coughs; but they usually drop it on sugar, and take it in that form.

To your other correspondent, Mr. J. Knowles, I am indebted for reminding me of another purpose for which the residual resin may be used, viz. the preservation of lard and pomades; it may be seen at page 252, Vol. V., Second Series, PHARMACEUTICAL JOURNAL, that I mentioned the same thing in a paper upon ointments, read at an evening meeting at that time,—my attention having been drawn thereto in a work written by the late M. Moquin-Tandon. I then stated that, in the event of a scarcity of benzoin, the resin of tolu might answer the purpose, but that it has not the same fragrant odour; and that some lard which I had prepared with it as an experiment, after fifteen months' keeping was much changed, though still retaining some of the tolu odour.

A. F. HASELDEN.

18, *Conduit Street, January 1st*, 1872.

IN MEMORIAM.

"From information I received," I found myself, some three or four weeks ago, in the Grange Road, Bermondsey. A chemist and druggist (an old member of the Pharmaceutical Society) had passed away from this troublesome world by his own hand, and the fact had not been recorded. To the West-end chemist the Grange Road, Bermondsey, for all practical purposes, is an absolute myth—a something possibly heard of, but never seen. Who would dream of taking an omnibus from the Bank or the Royal Oak to the Grange Road, Ber-

* The mistake cannot be entirely attributed to either our correspondent or the printer; it had its origin in the illegibility of the "lb.," which might easily have been taken for something else, or overlooked altogether, which last occurrence actually took place.—ED. PHARM. JOURN.

mondsey? There, however, it is, as may be learnt from the maps, a somewhat imposing thoroughfare leading from nowhere to nowhere. Nevertheless a considerable amount of traffic passes along it from end to end. The shops are small and of the poorer class. Time was when the Grange Road, Bermondsey, was better in most respects than it is now. There could be no earthly reason why a chemist should not gain there a comfortable livelihood, and accordingly a chemist there was, and has been, until a week or two since, when the contents of that deadly one-ounce stoppered bottle so well known to the trade did its work, as it always will do, surely and but too well. The bottles and their contents remain, it is true, but the familiar presence of the owner is no longer a plain and simple fact.

Poor Elkington's shop is well situated for trade, and he was himself a good tradesman. One of the old school, his motto was "business," and, compelled almost by surrounding circumstances, he went in for those dreadful trade precepts (oh, what a shudder their remembrance creates!) which, in these enlightened pharmaceutical days, seem to belong to a past age. As a friend and acquaintance he is remembered with great regret by those who knew him best. His bearing was that of a gentleman, whilst his kindly and cheerful disposition rendered him a genial companion to all those who were one with him in sentiment and thought. So much the more is the psychological fact now to be recorded a simple mystery. All was apparently well at eleven o'clock on the Sunday night. Nothing unusual was, or could be, observed in his manner or conversation, and yet by some unaccountable perversity or paradox of human nature, he shortly afterwards went deliberately to his poison cupboard, took therefrom the bottle already referred to (acid. hydrocyan. dil.), ascended to his room, drank from it, and got quietly into bed. Here was he found by the housekeeper the next morning lifeless and cold. It was impossible to be mistaken. The fact was only too clear—he had been dead for some hours. So passed away poor Elkington from all earthly care into the quiet grave! Whate'er may betide now, certain it is he will never again be seen behind that neatly-kept and well-to-do counter in the Grange Road, Bermondsey.

Can we point a moral or adorn a story like this? At the inquest the jury returned a verdict of "temporary insanity." Why, then, was this man, for the time being, insane so to put it? There was no pecuniary embarrassment, no grievance or difficulty that would occupy a serious, not to say suicidal, thought in the minds of the majority of men. No scrap or document of any kind was left to tell the secret of the act. Down, deep down in the heart did the same lie unsuspected and unknown. There are men who will laugh at disappointments and glory in overcoming difficulties as they crop up before them; but this is not given to all. A temperament and condition of mind keenly and nervously organized is not the combination best suited to battle through life with its interdependent conditions of failure and success. Disappointments are heightened, losses are accounted ruin, pain cannot be borne, and despair is ever at hand to whisper, if need be, the last resource of a desperate will.

"Trifles light as air
Are to the jealous confirmation strong
As proofs of holy writ."

Thus are the heightened faculties of the mind ever ready to strengthen doubt and confirm suspicion—to cast aside hope and to lose all faith in the realities of a possible future. This, however, it must be said, is by no means incompatible with a cheerful demeanour whilst the path of life is strewn with flowers, and the cord runs smoothly over the wheel of time. We are so accustomed to the term "temporary insanity," that it does not at all alarm us. It is simply a generous interpretation of something wrong in the machinery of human life, mayhap of passing significance, yet all-sufficient for its fell purpose. Can we learn anything from it, this "temporary insanity," which we may apply with advantage to ourselves? Were we all philosophers, we might learn much; but the difficulty of contending against natural susceptibilities and transmitted or inherent weaknesses is terribly great. Nevertheless, could we but feel how much real truth there is in our commonplace humanity, we might well pause and consider. An able writer has given us an idea which, if not an abstract doctrine, is at least an intelligible precept. "Taking things easy is defensible in theory, and healthy and satisfactory in practice." That this mood falls short of the highest is not to be denied, and to "take things easy" with error and sin is shameful treachery to God. But life is not long enough to be for ever playing at "much ado about nothing." If "taking things easy" denies to us a place in the foremost ranks of the world, it "at least saves us from losing our wits at bugbears and scarecrows."

All honour to those gifted men who are the pioneers of our faith in that which is and shall be! But "judge how we will of the fact, the deepest thinkers on life have ended with being more impressed with the insignificance than the importance of its achievements, interests, and endeavours." Self-knowledge is the essence of all knowledge. We may not be easy-going people, but the opportunity is at least afforded us of learning wisdom from experience. If we cannot altogether control the insidious workings of original temperaments, we can, as far as may be, avoid the shoals which impinge upon them. The vast majority of mankind must follow the lead of those colossal minds which rule the world, and, leaving our destiny in their hands, to what comparative insignificance do we not reduce all that remains! If the "stings and arrows of outrageous fortune" cannot be borne, better, if such be possible, avoid them than seek a remedy in the deadly phial. Happily, in our interpretation of the mental phenomena leading to suicide, we are not unmindful of the aphorism:—

"To err is human, to forgive divine."

And when, unfortunately, a brother pharmaceutist, either in the east or the west, is brought to this, it is impossible to withhold a regretful sympathy that there should have existed a hidden cause for so sad and painful a story. The case of poor Elkington is still a mystery, and likely to remain so. Had he been able to overmaster the sudden grief which assailed him, he would doubtless have discovered its true meaning and learnt something of the uses of adversity. As it is, it remains only to strike his name from the register, and to record the fact of his death as an unfortunate episode to be recalled only with the very deepest regret. This alone can we do. "The rest is silence."

January 1st, 1872. W. WILLMOTT.

EARLY CLOSING.

Sir,—It gave me great pleasure to read Mr. Stables' letter on this subject. I would suggest, as a commencement, that after a certain time, say the usual hour that other trades suspend business, all customers should be charged 25 to 50 per cent. on all articles they may require (perhaps excepting physicians' prescriptions), which is only what a mechanic would do if you wished him to work overtime.

I have no cause for complaint myself, as my hours are short compared with many, 7.30 A.M. to 8 P.M., with occasional customers afterwards, principally for 1*d.* pills, castor oil, linseed meal, seidlitz powders, and occasionally a prescription; most, if not all, might have been obtained before closing, and no doubt would be if an extra price were charged.

The chemists in this town also close on Wednesday at 5 P.M. all the year round. Of course some one must remain in charge, but still it gives great facility, especially during the summer months, for a pleasant stroll, and in the winter months for study and friendly society.

I think I may truthfully say there is not a tradesman who would go back to the old hours again. The best way to prove how it works is to write and ask the chemists how they have found it work.

What has been done in this town may, and I hope will, be done in other provincial towns at no very distant date. We may then see our friends in London and other large towns follow our example. We ought to be able to make a comfortable competence without making slaves of ourselves, if we work with a will at the proper time.

In conclusion, I hope, with Mr. Stables and many others, that some of our leading men will take the matter into consideration. THOMAS BUCK.

Chelmsford, January 1st, 1872.

Bisulphite of Magnesia.—We have received a letter from "A Graduate of Cambridge" in reference to this subject, but since it treats almost entirely of a medicine the nature of which is not indicated by the name, we are unable to insert it.

J. S. H.—The fragments of the plant sent are insufficient for identification. A more complete specimen, together with the history of the plant, would be required for the purpose.

John Bradshaw (Congleton).—The thick consistence is preferred by many medical men. Probably your difficulty might be overcome by making the preparation brought for it.

THE PARIS SCHOOL OF PHARMACY.

BY WALTER HILLS.

In former papers on the "École de Pharmacie" in Paris, I have given short notices of the laboratory work and of the lectures; now I would say a few words respecting the examinations.

As is generally known, there are two grades of pharmaceutists in France, viz. "la première classe" and "la seconde classe." Members of the former only can establish themselves in *any* part of the country, while those of the latter must confine themselves to the special department or district they have chosen, and for which they have been inscribed; and legally, they have no right to establish themselves in either of the three cities of the faculties, Paris, Strasbourg,* and Montpellier. I say legally, for I believe that many of this class have, for some years past, kept open pharmacies in Paris, and although the Government has, to some extent, closed its eyes to the fact, still it may wake up at any moment, and inflict a fine for every day of disregard of the law.

To become a "pharmacien de première classe," it is necessary, before repairing to either of the cities of the faculties, to have served three years in an open pharmacy, and also to have passed the examination of the "Baccalauréat-ès-Sciences." After this, three years are required at one of the above schools; that is to say, that the student's name must be on the books for that period, and his numerous fees regularly paid, even if he does not make his appearance until the examination day. Thus no expenses are saved, although a man works up entirely in the country, or at his own home. During these three years, five "semestriel" and four finishing examinations must be passed; on the successful issue of each of which, as well as at the commencement of his studies, one or more inscriptions are given to the candidate, and twelve of these inscriptions are necessary before he is duly admitted to be a member of the first class. The "semestriel" examinations serve as a test to ascertain that the student has made the best use of his time during the session, and they treat of the subjects that have been especially brought before his notice during that term. The other four examinations, which are all passed towards the close of the three years, are as follows:—

I. Pharmacy, Chemistry, Physics, Toxicology.

II. Zoology, Materia Medica (specimens and history), Botany (recognition of plants, etc.), Mineralogy (recognition of specimens and history).

III. Synthesis. Ten chemical, and ten pharmaceutical preparations. The candidate describes the process he intends to employ in making these, and

IV. He has both to exhibit these preparations, which he has made in the interval in the laboratory, and also to describe them more fully than in the previous examination.

The fees for a candidate for the "première classe" are—

Inscriptions (12 à 30 fr.)	360 fr.
Travaux pratiques pendant les trois années, 100 fr. par année	300 ,,
Cinq examens semestriels (30 fr. par exam.)	150 ,,
Les deux premiers examens de fin d'études (80 fr. par exam.)	160 ,,
Le troisième examen de fin d'études	200 ,,
Trois certificats d'aptitude (40 fr. par certif.)	120 ,,
Diplôme	100 ,,
Total	1390 fr.

And now we come to the requirements for a "pharmacien de deuxième classe."

I. Six years' apprenticeship in a pharmacy.

II. "Examen de grammaire" (answering to our Preliminary).

III. "Inscription à 30 francs."

IV. A "semestriel" examination, and one year of laboratory work.

V. Finishing Examination.

The expenses are:—

Inscriptions de l'école supérieure de pharmacie (4 à 30 fr.)	120 fr.
Épreuves pratiques	120 ,,
Trois certificats d'aptitude (40 fr. par certificat)	120 ,,
Diplôme	100 ,,
Total	460 fr.

All of the examinations of which I have spoken are public, and consequently I was able to be present at a considerable number of them. The examination-room has somewhat the appearance of a small court of justice. At the upper end is the semicircular table for the professors, of whom there are usually three or four, the chairman wearing his hood and gown; in the centre is the raised seat for the candidate, and at the lower end are the seats for the public.

In the "herboriste" examinations, which are held during the summer months at the School of Pharmacy, and in which a great proportion of the candidates are women, the public end of the room is equally divided for the two sexes. The Professors usually retire for a minute or two's consultation after each examination, and on their return the chairman announces aloud the success or failure of the candidate; and if the former case, he adds the words, moderately well, well, or very well, according to the amount of satisfaction given.

The length of time given to each subject in an examination is ten minutes, which is regulated by a sand-glass passed in rotation to each examiner.

In conclusion, it will be seen that the time and expenses requisite for the acquirement of a diploma of the first class, are by no means unimportant; and it must be borne in mind, as stated above, that even if a man works up at his own home, he must be duly inscribed on the books and regularly pay his fees for the usual term of years, although he is not personally profiting by the instruction given at the lectures and in the laboratory. Thus I found that only a very small proportion of the students whose names were on the laboratory books, came to benefit by the instruction and advice of the distinguished manager, M. Personne.

As to the amount of knowledge required by the candidate in the examinations, I believe, from first to last, it is more extended than in our own in England, and this should not be forgotten at the present time, when there is such an outcry at the

* Of course, since the late war, Strasbourg has ceased to hold the position named.

difficulty of our "Preliminary examination," in consequence of so many of the candidates failing to acquit themselves to the satisfaction of the examiners in the elements of Grammar, Arithmetic and Latin.

THE FLUID EXTRACT OF CHESTNUT LEAVES.*

BY JOHN M. MAISCH.

In 1862,† Mr. G. C. Close called attention to the beneficial effects of the leaves of the chestnut-tree, *Castanea vesca*, L., var. *americana*, in whooping-cough. I have since learned that the leaves are popularly used and highly valued in various parts of this country as a remedy for this disease, and that in some sections of New Jersey and also of the Southern States peach leaves are employed for the same purpose. Of the latter, Dr. F. P. Porcher‡ remarks: "A tea of the leaves is a favourite domestic palliative in whooping-cough and in most pectoral affections."

The favourable effects of chestnut leaves in the disease mentioned have since been confirmed by the observations of several physicians; and from cases which have come under my notice, their use appears not only to frequently alleviate the severity of the attacks, but even to break the paroxysms, leaving merely a cough attended with mucous expectoration, which gradually yields to ordinary expectorants. Chestnut leaves, however, are not a specific against pertussis, though its effects are perhaps beneficial in a majority of cases. In 1868, during the prevalence of whooping-cough in this city, two of my children, being attacked with it, derived no benefit whatever from their use, nor had bromide of ammonium and hyoscyamus any good result; but the spasms were allayed by assafœtida, which was given in the form of syrup.

Dr. A. S. Gerhard, of Philadelphia, at whose request I have collected chestnut leaves since 1867, has used this remedy quite extensively, at first in the form of infusion, one-half to one ounce to the pint, which was freely administered; subsequently I prepared a syrup and a fluid extract, the latter preparation being greatly preferred by him on account of the small dose required, which is from a few drops to a teaspoonful, according to the age of the patient and the severity of the symptoms.

Obviously the time at which the leaves are collected must be of considerable influence upon whatever medicinal properties they may possess. I have collected them from the beginning of July, when the flowers were fully expanded, until the beginning of October; when gathered late in the fall, the green leaves only were selected. It had been my intention to use the leaves from the different months separately, with the view of having their relative efficacy tested; but the demand becoming unexpectedly large, the various collections had finally to be used indiscriminately. However, as far as the observations could be made, they appeared to be rather in favour of the fall collections made in September and early in October.

Chestnut leaves contain considerable tannin; their taste is not unpleasant, merely mildly astringent, without any decided bitterness. The remedy is therefore readily taken by children, whether in the form of sweetened infusion, syrup or fluid extract containing sugar. In preparing the fluid extract, the use of diluted alcohol as the exhausting menstruum was not attended with as satisfactory results as that of water, which was therefore employed. A purely saccharine fluid extract was of too thick a consistence, in consequence of the large amount of extractive matter dissolved by the water. After several experiments, a small quantity of glycerine was employed and the sugar correspondingly reduced, when a more attractive preparation of the consistency of a dense syrup was obtained.

One difficulty in the management of chestnut leaves in the preparation of fluid extract is their bulkiness and flexibility; dried in the air, they cannot with any degree of facility be reduced to a powder, either in the mortar or hand-mill, so that their exhaustion cannot be effected by percolation. After cutting and bruising them, they are covered with hot water in an enamelled kettle, and digested over-night, when they are expressed; the digestion and expression are repeated twice with fresh portions of water, and the three infusions, each one mixed with glycerine or a portion of the sugar, evaporated to a small bulk when they are mixed, and the evaporation continued until the proper measure is obtained; it is then set aside for several days and decanted from the small quantity of sediment.

The proportions used are as follows:—Chestnut leaves, dried, cut and bruised, 16 troy ounces; glycerine, 5 troy ounces (f℥iv); sugar, 8 troy ounces; hot water a sufficient quantity: the fluid extract to measure 16 fluid ounces.

* Read at the Pharmaceutical Meeting of the Philadelphia College of Pharmacy, November 21. Reprinted from the *American Journal of Pharmacy*.

† Proceedings Amer. Pharm. Assoc., p. 236. *Amer. Journ. Pharm.* 1863, p. 66.

‡ 'Resources of the Southern Fields and Forests,' p. 198.

VESICATING INSECTS.

BY M. C. COOKE, M.A.

(*Continued from page* 522.)

Potato Blister-fly, *Lytta vittata*, Oliv.; brown; elytra black, with the margin and a longitudinal band yellow.—Oliv. Ent. iii. t. 1. f. 3; Durand, Journ. Phil. Coll. Pharm. ii. p. 274. f. 4; Wood and Bache, Disp. U.S. (1867), p. 205; Warner, Amer. Journ. Pharm. xxviii. p. 195; Leidy, Amer. Journ. Med. Sc. (Jan. 1860), p. 60; Harris, Injurious Insects (1862), p. 136; Packard's Guide, p. 479. f. 452. *Lytta vittata*, Fab. Syst. p. 260; Pall. Ins. Sib. t. E. f. 33; Brandt and Ratzb. ii. t. xviii. f. 12. *Epicauta vittata*, Dej.

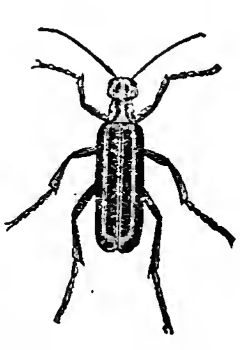


Fig. 12.—*Lytta vittata.*

Native of North America.

The potato-fly is rather smaller than *Cantharis vesicatoria*, which it resembles in shape. Its length is about six lines. The head is light red, with dark spots upon the top. The feelers are black. The elytra, or wing-cases, are black, with a longitudinal stripe in the centre and with a yellow margin. The thorax is also black, with three yellow lines, and the abdomen and legs, which have the same colour, are covered with cinereous down. It inhabits chiefly the potato plant, and appears about the end of July or beginning of August, in some seasons very abundantly. It is found on the plant in the morning and evening, but during the heat of the day it descends into the soil. The insects are collected by shaking them from the plant into hot water, and are afterwards carefully dried in the sun. They are natives of the Middle and Southern States.

This species of *Cantharis* was first described by Fabricius in the year 1871, and was introduced to the notice of the profession by Dr. Isaac Chapman, of Bucks County, Pennsylvania, who found it equal, if not superior, to the Spanish fly as a vesicatory. The testimony of Dr. Chapman has been corroborated by that of many other practitioners, some of whom have even gone so far as to assert that the potato-fly is not attended with the inconvenience of producing strangury. But this statement has been ascertained to be incorrect; and, as the vesicating property of all these insects probably depends on the same proximate principle, their operation may be considered as identical in other respects. If the potato-fly has been found more speedy in its effects than the *Cantharis* of Spain, the result is perhaps owing to the greater freshness of the former. It may be applied to the same purposes, treated in the same manner and given in the same dose as the foreign insect.

Professor Procter obtained cantharidin from this species; and Mr. W. R. Warner has shown that the proportion of this ingredient is but slightly less than in Spanish flies, the former yielding 1·99, the latter 2·03 parts in 500. Professor Leidy, of the University of Pennsylvania, ascertained by experiment that the vesicating property of this insect resides in the blood, the eggs and a peculiar fatty matter of certain accessory glands of the generative apparatus.

Occasionally potato vines are very much infested by two or three kinds of *Cantharides*, swarms of which attack and destroy the leaves during midsummer. One of these kinds has thereby obtained the name of the potato-fly. It is the *Cantharis vittata*, or striped *Cantharis*. It is of a dull tawny yellow, or light yellowish-red colour above, with two black spots on the head and two black stripes on the thorax and on each of the wing-covers. The under side of the body, the legs and the antennæ are black, and covered with a greyish down. Its length is from five to six-tenths of an inch. In this and the three following species the thorax is very much narrowed before, and the wing-covers are long and narrow, and cover the whole of the back. The striped *Cantharis* is comparatively rare in New England, but in the Middle and Western States it often appears in great numbers, and does much mischief in potato fields and gardens, eating up, not only the leaves of the potato, but those of many other vegetables. It is one of the insects to which the production of the potato-rot has been ascribed.

Brassy Blister-fly, *Lytta ænea*, Say; greenish-blue or brassy, hairy; elytra glabrous, brassy or purplish; feet rufous; knees and trochanters black. —Say's 'Entomology,' iii. p. 168. *Lymexylon æneum*, Melsheimer's 'Catalogue.' *Cantharis nigricornis*, Lec. Journ. Acad. Nat. Sc. Phil. ser. 2. i. p. 90.

Body bluish-green or dark brassy, opaque. Head punctured, hairy. Eyes oval, not emarginate, fuscous. Antennæ black, longer than the thorax, joints subturbinate, terminal one largest near the middle, acute at tip. Labrum prominent, punctured, divided by a profound sinus into two divaricated lobes. Palpi blackish. Thorax punctured, narrowed before, not wider near the middle than at base, hairy. Scutel hairy. Elytra glabrous, somewhat rugose, with two obsolete elevated lines. Feet rufous. Knees and trochanters black. Length rather more than half an inch.—Inhabits Pennsylvania.

Polished Blister-fly, *Lytta polita*, Say; head and thorax glabrous, brassy, green, polished; elytra pale olivaceous; feet rufous, trochanters and four anterior tibiæ bluish.—Say's 'Entomology,' iii. p. 169.

Body above glabrous, punctured, beneath hairy. Head brassy, polished, with distant punctures. Eyes large, oval, entire, prominent. Antennæ black, rather long. Joints oblong-conic, terminal one largest beyond the middle, abruptly narrowed so as to resemble a twelfth joint. Tip acute. Labrum blue, bilobate, lobes divaricating. Palpi black, not remarkably dilated at tip. Thorax glabrous, brassy, polished, punctured each side, distinctly wider before the middle. Scutel hairy. Elytra pale olivaceous, tinged with brassy, slightly rugose, two slightly elevated obsolete lines. Feet rufous. Knees and two anterior pairs of tibia blue. Tarsi fuscous. Length three-fifths of an inch.—Inhabits Georgia.

Brick-red Blister-fly, *Lytta afzeliana*, Fabr.; testaceous; head and thorax with black points; elytra with an oblong spot and a black sinuated line.—Fabr. Sys. El. ii. p. 78. *Cantharis sinuata*, Oliv. Ent. iii. 46. t. 2. f. 14. *Pyrota afzeliana*, Dejean.

About the size of *L. vesicatoria*. Antennæ black. Head inflexed brick-red, punctate with black. Thorax narrower than the head, brick-red, punctate with black. Elytra brick-red, with an oblong black spot at the base and a black waved line. Body varied with dingy red and black. Feet black. Base of the femora reddish.—Native of the southern states of North America.

(*To be continued.*)

CHEMICAL EXAMINATION OF CHAMOMILE FLOWERS.*

BY M. CAMBOULISES.

In this paper the author publishes the results of an investigation, undertaken by him, into the nature of the principles contained in the flowers of the *Anthemis nobilis*. One hundred grams of the flowers of the double-flowered variety were exhausted in a displacement apparatus by sulphuric ether, sp. gr. 0·724, and free from alcohol. The tincture so obtained, when evaporated in a water-bath, yielded 6·344 grams of ethereal extract. This was treated with boiling distilled water, which took up 0·738 gram of soluble matter, leaving an insoluble residue that weighed 5·606 grams, and consisted of a substance analogous to wax, together with a small quantity of chlorophyll. The aqueous solution of the ethereal extract, perfectly clear at first, became a

* *Journal de Pharmacie et de Chimie*, 4th ser. vol. xiv. p. 337.

little cloudy upon cooling; the turbidity increased gradually, and eventually a yellow substance was deposited, which, under the microscope, presented the appearance of small granulations. This yellow substance dissolved completely in alcohol, and gave the following reactions:—With perchloride of iron a bottle-green precipitate; with neutral acetate of lead a yellow precipitate; with ammonia a yellow precipitate. A portion of the alcoholic solution evaporated to dryness yielded a residue which, seen under the microscope, had the form of small granulations. This substance was impure quercitrin. The clear portion of the aqueous solution of the ethereal extract treated with ammoniacal sulphate of magnesia gave a brownish-yellow precipitate, composed principally of impure phosphate of ammonia and magnesia. The aqueous solution was then evaporated to dryness, and taken up by sulphuric ether. Upon spontaneous evaporation taking place, a residue was left which, under the microscope, presented the appearance of beautiful prismatic needles, possessed of great bitterness and strongly reddening litmus paper. Its solution gave no precipitate with perchloride of iron; with neutral acetate of lead, a very slight precipitate after some time; and with chloride of calcium, chloride of barium and nitrate of silver, no precipitate. Submitted to the action of heat, these crystals were decomposed without volatilization.

It appears from these facts that the flowers of *Anthemis nobilis* contain a particular acid, which is probably identical with that found by M. Pattone in the flowers of the common chamomile (*Anthemis arvensis*). The author was unable to carry his examination of this acid further, in consequence of the very small quantities obtained.

The following process may be adopted for isolating this acid:—Treat dried chamomile flowers in a displacement apparatus with ether free from alcohol, evaporate the tincture in a water-bath to the consistence of an extract; treat with boiling distilled water, filter warm, let it stand for twenty-four hours, filter afresh to separate the insoluble part, evaporate the filtrate to dryness, redissolve the residue in ether, and leave it to evaporate spontaneously.

After having exhausted the flowers with ether, the author treated them with rectified spirit. The alcoholic extract so obtained was without bitterness, and consisted principally of a yellow substance that, examined under the microscope, was seen to contain yellow globules of a rich oil.

The flowers of *Anthemis nobilis*, treated with distilled water, yielded a notable quantity of glucose. The amount of sugar indicated by analysis varied according as the estimation was made by means of Fehling's liquid, or by fermentation with beer yeast; the quantity indicated by Fehling's liquor being 23·498 per cent. of the weight of the flowers, while fermentation only indicated 14·890 per cent. It is probable, therefore, that the flowers contain, besides glucose, another substance that reduces the Fehling liquor. Professor Filhol* has previously shown that the quantity of sugar present in flowers varies from 12 to 23 per cent.

The author also analysed the inorganic matters contained in the flowers of *Anthemis nobilis*. He submitted 100 grams of the flowers to incineration in a platinum crucible, which yielded a residue weighing 6 grams. This residue, treated with distilled water, gave 2·852 grams of insoluble, and 3·175 of soluble matter.

The soluble matter was estimated as follows:—

Sulphate of potash . . .	0·8103 gram.
Chloride of potassium . .	1·1629 ,,
Carbonate of potash . . .	1·1907 ,,
Alkaline phosphate . . .	0·0111 ,,
	3·1750

The insoluble matters were estimated as follows:—

Silica	0·3967 gram.
Phosphate of lime	1·6894 ,,
Phosphate of magnesia . .	0·1593 ,,
Carbonate of lime	0·5798 ,,
	2·8252

When the author had arrived at this stage of the investigation he became acquainted with a memoir by M. Pattone, giving the results of his examination of the flowers of *Anthemis arvensis*,† and announcing the presence of an alkaloid and an organic acid in that plant. He therefore adopted the process of that operator in attempting to isolate a similar alkaloid from the flowers of *Anthemis nobilis*. Three kilograms of the dried flowers were submitted to distillation to obtain an aqueous extract. This was exhausted with boiling rectified spirit; the residue was then treated with boiling distilled water, the aqueous liquor filtered while warm, and left to cool. It deposited an abundant precipitate of phosphates, which were separated by filtration, and to the filtrate solution of ammonia was added, drop by drop, until an alkaline reaction was obtained; it was then set aside for twenty-four hours to obtain the precipitation of the alkaloid announced by M. Pattone. At the end of that time a gelatinous precipitate was formed enclosing some shining crystals, which, upon examination, were found to be crystals of phosphate of ammonia and magnesia. The gelatinous precipitate, which, according to M. Pattone, should contain the alkaloid, was treated with acetic acid; but the author failed to detect its presence by any of the usual tests for alkaloids. Treated with alcohol, the precipitate gave a solution with an alkaline reaction, and a similar result followed the use of ether. Dried and incinerated to destroy organic matter a residue was left, consisting almost entirely of phosphates of lime and magnesia.

It appears, therefore, to be satisfactorily established, that the flowers of *Anthemis nobilis* contain an organic acid exactly similar to the anthemic acid isolated by M. Pattone from the flowers of *A. arvensis*; but M. Camboulises was unable, although he followed scrupulously the process given by M. Pattone, to obtain any evidence of the presence of a corresponding alkaloid.

* "Note relative à la Matière Sucrée des Fleurs, par M. Filhol." (*Mém. de l'Acad. des Sciences de Toulouse*, 5th ser. vol. v. p. 445.)

† "Sur la Présence d'un Alcaloïde et d'un Acide Organique dans la Camomille vulgaire (*Anthemis arvensis*)," par M. Pattone (*Journ. de Pharm. et de Chimie*, 3rd ser. vol. xxxv. p. 198).

NOTE ON FUCUSOL.*

BY JOHN STENHOUSE, LL.D., F.R.S.

In a paper which I communicated to the Royal Society of London in 1850† "On the Oils produced by the Action of Sulphuric Acid upon various Classes of Vegetables," after describing the sources, method of preparation, and characteristic properties of furfurol, and its educts, I described another isomeric substance closely resembling furfurol, both in its physical and chemical properties, and which I named fucusol from the source whence it had been obtained, namely, *Fucus nodosus*, *F. vesiculosus* and *F. serratus*, etc.

The nature of the substance which yielded furfurol was involved in considerable obscurity until the publication of Gutzkow's paper "On the Furfurol-yielding Substance in Bran,"‡ which he found to be present in it to the amount of 15 to 20 per cent., and which, when boiled with dilute sulphuric acid, was converted into a brownish sweet syrup. This is the substance from which furfurol is obtained by distillation with sulphuric acid or hydrochloric acid.

Fucusol.

I have found that when seaweeds were boiled with very dilute sulphuric acid, containing about 3 per cent. of acid, that a substance corresponding to that described by Gutzkow was obtained, which, when distilled with sulphuric or hydrochloric acid, yielded fucusol. In my paper of the year 1850 I have described the difference in the physical properties of furfurol and fucusol, and also the difference between the products obtained by the action of ammonia upon them and the bases derived from these. I have again repeated the examination of these substances with great care, and find my former statements to be correct. In addition to these, I have recently prepared the aniline compound analogous to furfur-aniline.§ *Fucusaniline* hydrochlorate crystallizes in needles of a magnificent purple colour, and closely resembles the corresponding furfurol compound.

As is well known,|| when furfurol is boiled with water and silver oxide, metallic silver is deposited and silver pyromucate formed, which remains in solution. In a similar manner I found that when fucusol was digested at 100° C. for five or six hours with an excesss of recently precipitated silver oxide and a considerable quantity of water, its odour gradually disappeared, and at the completion of the reaction a silver-salt was found in solution, whilst metallic silver was deposited, partly in a granular state and partly as a mirror, on the bottom of the flask. Sufficient hydrochloric acid was then added to the hot filtered solution to precipitate the silver. After the removal of the argentic chloride it was carefully evaporated at a temperature below 100°; and the brown semi-crystalline mass thus obtained boiled with light petroleum oil, which dissolved the acid and left the colouring matter. One or two crystallizations from boiling water rendered it quite pure.

Analysis.—0·188 grm. substance gave 0·370 grm. carbonic anhydride and 0·080 grm. water.

		Theory.	Found.
C_5	60	53·56	53·68
H_4	4	3·57	4·25
O_3	48	42·87	—
	112	100·00	

From this analysis, it will be seen that this acid, which I propose to call β *pyromucic acid*, is isomeric with ordinary pyromucic acid, from which, however, it slightly differs in its physical properties. The melting-point of pure β pyromucic acid is 130°, being nearly the same as that of the acid obtained from furfurol, which I found to be 133°, and which Schwanert* gives as 134·3°. The β pyromucic acid from fucusol crystallizes from its aqueous solution in small rhomboidal plates, whilst the acid which I had prepared from furfurol crystallized in flat needles.

Silver β pyromucate.—This compound was prepared from the pure β acid by boiling it for a short time with silver oxide and a sufficient quantity of water, filtering, and setting aside to crystallize. A single recrystallization from boiling water, in which it is only moderately soluble, rendered it quite pure. On cooling the hot aqueous solution, the silver β pyromucate is obtained in long flat needles, whilst the corresponding salt of the ordinary acid forms small crystalline scales; 0·505 grm. of silver-salt gave 0·330 grm. argentic chloride, which corresponds to 49·18 per cent. of metallic silver. The formula $C_5H_3AgO_3$ requires 49·32 per cent.

From this silver determination it will be seen that this compound is isomeric with the ordinary silver α pyromucate, $C_5H_3AgO_3$.—*Chemical News.*

* A paper read before the Royal Society.
† Phil. Trans. 1850, p. 467.
‡ Zeitsch. Chem. 1870, p. 360.
§ Proc. Roy. Soc. vol. xviii. p. 537.
|| Ann. Chem. Pharm. vol. cxvi. p. 259.

* Ann. Chem. Pharm. vol. cxvi. p. 257.

THE CONSERVATION OF FORESTS AND THE PRODUCTION OF POTASH.†

In the course of a lecture upon the importance of adopting a proper system of forest-culture in the colony of Victoria, by Baron Ferdinand von Mueller, Ph.D., F.R.S., the Government Botanist for Victoria, and Director of the Botanic Gardens of Melbourne, he thus points out the influence such a course would have upon the supply of potash, and gives some very interesting particulars concerning its production. He says:—

Among the undeveloped wood resources we must not pass that referring to potash, particularly as this alkali can be obtained without sacrifice of any valuable timber, and from localities not accessible to the wood trade.

For the preparation of potash the wood, bark, branches, and foliage are burnt in pits sunk 3 or 4 feet in the ground; the incineration is continued till the pit is almost filled with ashes. Young branches and leaves are usually much richer in potash than the stem wood, hence they should not be rejected. The ashes thus obtained are placed in tubs or casks on straw, over a false bottom. Cold water in moderate quantities is poured over the ash, and the first strong potash liquid removed for evaporation in flat iron vessels, while the weaker fluid is used for the lixiviation of fresh ashes.

While the evaporation proceeds, fresh portions of strong liquid are added until the concentrated boiling fluid assumes a rather thick consistence. At last, with mild heat and final constant stirring, the whole is evaporated to dryness. This dry mass represents crude potash, more or less impure, according to the nature of the wood employed. A final heating in rough furnaces is needed, to expel sulphur combinations, water and empyreumatic substances; also, to decompose colouring principles. Thus pearlash is obtained.

Pure carbonate of potash in crude potash varies from 40 to 80 per cent. Experiments, as far as they were instituted in my laboratory, have given the following approximate results with respect to the contents of potash in some of our most common trees. The wood of our she-oaks (*Casuarina suberosa* and *C. quadrivalvis*), as well as that of the black or silver Wattle (*Acacia decurrens*), is somewhat richer than wood of the British oak, but far richer than the ordinary pine-woods.

The stems of the Victorian blue-gum tree (*Eucalyptus globulus*), and the so-called swamp tea-tree (*Melaleuca ericifolia*), yield about as much potash as European beech. The foliage of the blue gum-tree proved particularly rich in this alkali; and as it is heavy and easily collected at

† *Gardeners' Chronicle* (1872), p. 11.

the sawmills, it might be turned there to auxiliary profitable account, and, indeed, in many other spots of the ranges.

A ton of the fresh leaves and branchlets yielded in two analyses $4\frac{3}{4}$ lb. of pure potash, equal to about double the quantity of the average kinds of pearlash. The three species of Eucalypts spontaneously occurring close around Melbourne—the red gum-tree (*Eucalyptus rostrata*), the manna gum-tree (*E. viminalis*), the box gum-tree (*E. melliodora*), produced nearly 3 lb. of pure potash, or about 5lb. of pearlash, from a ton of fresh leaves and branches; while a ton of the wood of the red gum-tree in a dried state gave nearly 2 lb. weight of pure carbonate of potash, whereas the wood of the blue gum-tree proved still richer. A ton of the dry wood of the erect she-oak (*Casuarina suberosa*) furnished the large quantity of $6\frac{1}{2}$ lb. of pure potash. This result is about equal to that obtainable from the European lime-tree or linden-tree, which again is one of the richest of all European trees in this respect.

I wish it to be distinctly understood that I do not advocate an indiscriminate sacrifice of our forest trees for any solitary one of its products, such as the potash; because by any such procedure we would still more accelerate the reduction of our woods. On the contrary, good timber, fit for splitting or for the sawmill, ought to be far too precious for potash or tar preparation. But branchwood, bark, roots, crooked stems, and even foliage, might well be utilized for this industry, wherever the place is too remote to dispose of this material for fuel. The recommendation carries with it still more weight, if we remember how on many places the close growth of suckers or seedlings has to be thinned to allow of space for the new and unimpaired upgrowth of actual timber; whereas, moreover, now the remnants at places where trees have been felled, often block by impenetrable barricades the accessible lines of traffic through the forests, and are frequently the cause of the extensive conflagrations of the woods, by placing so much combustible, dry and mostly oily material within the easy reach of the current of flames. Should, unfortunately, the fiery element have anywhere swept through the forest, it may then prove advantageous to collect the fresh ashes before they are soaked by rain, with the object of extracting from them large quantities of potash. The whole process of potash preparation being one of the simplest kind, and involving only a very trifling expense in casks and boiling-pans, can be carried out anywhere as a by-work, the profit thus being not reduced by skilled or heavy labour or by costly plant. The demand for potash must always be considerable, as it is required for the factories of nitre (particularly from soda saltpetre), one of the three principal ingredients of gunpowder and blasting-powder; it is needed also for glass, alum, various kinds of soaps, dyes and many chemicals.*

Potash, although universally distributed, is best obtained in the manner indicated. I may remark, however, though deviating from my subject, that it is one of the most potent constituents in all manures, being especially needed in the soil for all kinds of root crops, for vines and maize; nor can most other plants live without it altogether, although the quantity required may be small; but I must add that, for manuring, potash by itself would be far too valuable.

Almost every kind of forage affords potash salts, these being among the necessaries for the support of herbivorous animals. Their undue diminution in food is the cause of various diseases both in the animal and vegetable world; or predisposes, by abnormal chemic components of the organisms, to disease.

The muscles of the human structure require a comparatively large proportion of carbonate of potash; it is also absolutely required in blood, predominating in the red corpuscles. Plants grown in soil of rocks containing much felspar—such as granite, gneiss, syenite, some porphyries, diorite—are always particularly productive in potash, potassium entering largely into felspathic compounds. The latter mineral yields in most cases from 12 to 15 per cent. of potash, which, if changed to carbonate, would become augmented by nearly one-half more. It is fixed chiefly to silicic acid in felspar, and thus only tardily set free through disintegration, partly by the chemic action of air, water and various salts, partly through the mechanic force of vegetation.* The importation of potash into Victoria during 1870 was only 170 tons, but with the increase of chemical factories we shall require much more.

It has justly been argued, that the chemical analysis affords a very unsafe guide to the artisan, as regards the quantity of potash obtainable from any kind of tree or other plant, inasmuch as necessarily the percentage must fluctuate according to the nature of the soil, this again depending on geologic structure and the quality and quantity of decaying foliage on any particular spot. It should, however, not be quite forgotten, that most plants have a predilection for that soil which contains, in regions otherwise favourable to them, also due proportions of such mineral particles as are essentially necessary for the normal nutrition of the peculiar species; for, otherwise, in the wild combat for space it would succumb or give place before the more legitimate occupant of such soil. Hence, at a glance, even from long distances, we may recognize in many of our forest regions an almost abrupt line of demarcation between the gregarious trees, where one geologic formation meets or replaces the other. Thus, trees richer in potash, or oils, or any other product, may often be traced with ease over their geologic area.

* Flint-glass contains about a fifth pure pearlash; crown-glass, the best of window-glass, rather more than a quarter. Some potash-nitre is wanted also in either case.

* The proverb of chemistry—"*Corpora non agunt, nisi fluida*"—is here also applicable.

METHODS FOR PREPARING PURE CARBOLATE OF POTASH.

BY M. RAMEL.

Carbolate of potash may be prepared by mixing together alcoholic solutions containing 94 parts of carbolic acid and 56 parts of caustic potash, and evaporating. Upon cooling a crystalline mass, composed of small, very thin, transparent, micaceous plates, is deposited. Dried over sulphuric acid the product consists of carbolate of potash in a very pure salt.

This salt may also be prepared by fusing together 37·4 parts of caustic potash and 62·6 parts of carbolic acid, the caustic potash being added gradually.

In whatever way prepared, carbolate of potash absorbs humidity from the air, turning first yellow and afterwards brown. It is very soluble in water and alcohol, less so in ether. It contains no water of crystallization, but it retains the water of composition of its respective constituents, which cannot be separated without decomposition of the state.

The author states that this compound is being increasingly used in French medicine, and that as a disinfectant it advantageously replaces carbolic acid itself.—*Bull. Soc. Chim.*

THE ARTIFICIAL PRODUCTION OF DULCITE.†

BY M. G. BOUCHARDAT.

The relations which exist between the saccharine substances obtained by the action of dilute acids upon cane-sugar and the hexatomic alcohol mannite are well known. All these bodies yield similar products by oxidation and particularly saccharic acid. M. Linnemann has, within the last few years, established these relations

† Comptes Rendus, vol. lxxiii. p. 199.

in a definite manner in the production of mannite from inverted cane-sugar by hydrogenation, a result that has been verified by others:—

$$C_{12}H_{12}O_{12} + H_2 = C_{12}H_{14}O_{12},$$
$$\text{or } C_6H_{12}O_6 + H_2 = C_6H_{14}O_6.$$

Relations of the same kind appear to exist between inverted sugar of milk (galactose) and a hexatomic alcohol yielding like that body mucic acid among its products of oxidation, viz. dulcite, or an isomeride of dulcite. These relations were first indicated by M. Berthelot,* and in the present paper M. Bouchardat gives the results of some experiments verifying this fact.

An aqueous solution of inverted sugar of milk was kept in contact with 2·5 per cent. sodium amalgam for two or three days, the amalgam being added bit by bit, and the liquid neutralized from time to time by dilute sulphuric acid. The action being terminated, the solution was exactly neutralized and the greater part of the sulphate of soda removed from it, first, by crystallization, then by the addition of double its volume of concentrated alcohol. It was then filtered and evaporated to a syrupy consistence. After some time small crystalline mamelons were formed, which were removed and drained on filter paper; the liquor left to itself, deposited a fresh lot of crystals. These were easily purified by recrystallization from water.

This substance consisted of small pure crystals, gritty between the teeth, with a scarcely sweet taste, not fermenting in contact with beer-yeast. It melted at 187° C., pure dulcite fusing at 188·5° C. It was very slightly soluble in strong alcohol; water at 20° C. dissolved 4·1 per cent., while pure dulcite is dissolved in the proportion of 3·6 or 3·7 per cent., the difference arising probably from some slight impurity. The solution had no appreciable action upon polarized light, a cold saturated solution causing no deviation in a column of 200 millimetres. It did not turn brown by boiling with potash, nor did it reduce an alkaline solution of copper salt; treated with nitric acid, diluted by four times its volume of water, it yielded crystals of mucic acid. Elementary analysis gave the centesimal proportions of dulcite and mannite:—

	1st time.	2nd time.	Calculated.
C	39·10	39·3	39·5
H . . .	7·85	7·9	7·7

This body would thus appear to be identical with dulcite, $C_{12}H_{14}O_{12}$ or $C_6H_{14}O_{12}$, the natural principle first obtained from the manna of Madagascar and afterwards in the juice of *Melampyrum nemorosum.*

PHYSIOLOGICAL ACTION OF TOBACCO WHEN USED AS A NARCOTIC, WITH ESPECIAL REFERENCE TO THE CONSTITUENTS OF TOBACCO SMOKE.

BY H. VOHL AND H. EULENBERG.†

The authors first give a short account of the introduction of tobacco and a summary of its chemical history, from which they conclude that the action of tobacco, when used as a narcotic, has been erroneously attributed to the nicotine it contains. This conclusion they confirm by analyses and experiments of their own.

The amount of nicotine in snuff they found to be only from ·0392 to ·062 per cent.; in the strongest tobacco for chewing there was only a mere trace of nicotine, and in other specimens of the same kind there was none at all, so that nothing like nicotine-poisoning can result from the use of these sorts.

They then analysed the smoke of strong tobacco containing 4 per cent. of nicotine, burning part of it in a pipe and part of it as cigars. The smoke was drawn by an aspirator first through potash-solution to collect acids, and then through dilute sulphuric acid to collect bases. Besides this, the gases given off when cigars were smoked were collected and examined. These consisted of oxygen, nitrogen, carbonic oxide and marsh-gas.

The potash-solution soon became brown, acquired an almost unbearable odour of tobacco-juice, and an oily substance collected on the surface which became of a consistence like butter when cold. This oily substance was removed, washed with water and dilute sulphuric acid, and distilled. It began to boil at 200°, but the boiling-point was not constant, and gradually rose. The distillate was at first fluid and oily, but when the temperature rose to 300°, the substance which then passed over thickened on cooling to a laminated mass, which, after being several times recrystallized from ether, formed pearly-white scales, melting between 94° and 95°, and having a higher boiling-point than mercury. In these characters, as well as in their percentage composition, they agree with the carbohydrate ($C_{19}H_{18}$) discovered by Knauss, and examined by Fehling and Fritsche. The oily distillate, after repeated treatment with potash and sulphuric acid, was colourless, neutral, burned with a smoky flame, and had a specific gravity of 0·8 to 0·87. From its percentage-composition (92 and 93 C, and 8 or 7 per cent. H) it seems to be a mixture of different hydrocarbons belonging to the benzene series or a series analogous to it. None of the nitro-compounds obtained by treating it with nitric acid had any definite character, and when they were deoxidized, no trace of aniline was found, showing that benzene was absent. After separating the oily substance, the potash-solution was distilled, and the distillate added to the sulphuric acid through which the smoke had already been passed. On saturating the residue with excess of dilute sulphuric acid, keeping it well cooled, a large amount of gas was given off which consisted of carbon dioxide, hydrogen cyanide and hydrogen sulphide. The two latter gases were also detected directly in the potash-solution. When it had been used for absorption during a considerable time, the reaction of cyanogen disappeared, and that of sulphocyanogen took its place. This may be the reason of a recent statement that tobacco-smoke contains no cyanogen.

The acid potash-solution was distilled, and acetic, formic, propionic, butyric, valerianic, and carbolic acids and creasote were discovered in the distillate; caproic, caprylic and succinic acids were doubtfully present.

The sulphuric acid which had served to absorb the bases had become dark brown and thick, and a dark-brown resin had separated. The liquid was filtered, and, after addition of the distillate from the potash, partially evaporated, cooled, and saturated with caustic potash, whereupon ammoniacal vapours escaped, and a brown oil, with an odour of tobacco-juice, collected on the surface. The liquid was distilled and saturated with caustic potash redistilled, and the most volatile bases were collected in a Horsford's nitrogen-apparatus containing dilute hydrochloric acid. These were found to be ammonium chloride and traces of ethylamine. The distillate was neutralized with dilute sulphuric acid, filtered, evaporated, and treated with strong potash, the bases taken up by ether, and the ethereal solution distilled. The distillate contained only ammonia. The oily residue was dried by caustic potash and submitted to fractional distillation. The resulting bodies were further separated by repeated distillation and crystallization of their platinum-salts, and at last the whole series of picoline or pyridine bases, analogous to the aniline bases, were obtained.

The identity of the following bases was determined by the boiling-point, percentage-composition, and the composition of the platinum double salt:—Pyridine, C_5H_5N, boiling-point 115°–116°. Picoline, C_6H_7N, boiling-point 134°–135° C. Lutidine, C_7H_9N, boiling-

* Traité de Chimie, fondée sur la Synthèse, vol. ii. pp. 165, 207.

† Arch. Pharm. [2] cxlvii. 130–166, from the *Journal of the Chemical Society.*

point 155°. Collidine, $C_8H_{11}N$, boiling-point 171·5°, is isomeric with xylidine, and is identified by the authors with the aldehydin of Ador and Baeyer by its composition and characters. Parvoline, $C_9H_{13}N$, boiling-point 187°–188°, isomeric with cumidine. Coridine, $C_{10}H_{15}N$, boiling-point 211°. Rubidine, $C_{11}H_{17}N$, boiling-point 230°, and, probably, Viridine, $C_{12}H_{19}N$, boiling-point 251°, were obtained in too small quantities to determine their percentage-composition, and were identified by their boiling-points and platinum salts. Nicotine was carefully looked for, but no trace of it was found, and the authors thus fully confirm the observations made by Zeise in 1843, that it does not exist in tobacco-smoke. They find that it can be easily separated from the pyridine bases, as it forms with zinc chloride a double salt difficultly soluble in alcohol, which the pyridine bases do not. The formula of this salt is $C_{10}H_{14}N\,2\,HCl\,Zn\,Cl_2 + 8\,H_2O$. The fact that stronger tobacco can be smoked in cigars than in a pipe is explained by the greater proportion of volatile bases present in the smoke of a pipe, and especially by the large quantity of very volatile and stupefying pyridine, while in a cigar little pyridine and much collidine is formed.

The authors think that the disagreeable symptoms which are felt by persons beginning to smoke, and the chronic affections which occur in those who smoke to excess, as well as the cases of poisoning from swallowing tobacco-juice, are due, not to nicotine, but to the pyridine and picoline bases. The idea that they were due to nicotine originated in the fact that picoline bases having a high boiling-point, such as parvoline, resemble that alkaloid greatly both in smell and in physiological action.

The authors did not test the physiological action of each base separately, but only that of a mixture of those bases which volatilize under 160°, and of those between 160° and 250°.

Both of these produced, like nicotine, contraction of the pupil, difficulty of breathing, general convulsions, and death. On *post-mortem* examination the respiratory passages and lungs were found congested. They act more quickly when taken internally than when injected subcutaneously, but they do not act so quickly as nicotine.

Plants which contain no narcotic are not unfrequently used for smoking, instead of tobacco. The authors tested the action of the pyridine bases produced from dandelion, willow-wood, stramonium, and of pure picoline from boghead coal. These had an action very much resembling, though weaker than, that of the bases from tobacco; but with the exception of those from willow-wood, they produced no contraction of the pupil. The vapour of picoline was also tested and found to be poisonous, producing great irritation of the respiratory passages, slight convulsions, and death.

The authors are acquainted with a person who can swallow the juice from a tobacco-pipe without being affected by it, but they consider that this exception does not impair the rule that picoline bases have a powerful action on the organism. They also think that the action of opium, when smoked, is not due to the alkaloids it naturally contains, and that the difference of its action from that of tobacco is simply due to a difference in the bases which are produced when the two substances are smoked.

CHROMIC ACID AS AN ANTISEPTIC, DISINFECTANT, ETC.,

More Especially as Compared with Carbolic Acid.*

BY JOHN DOUGALL, M.D. GLAS.

(*Continued from page 546.*)

Power in preventing animalcules.—As a preventive of germ life, chromic acid surpasses sixty-six other chemical bodies consisting of irritant, narcotic, and narcotico-irritant poisons, including all the known antiseptics and disinfectants, except two or three substances, with which it has not yet been compared. In this respect it greatly excels carbolic acid, the average preventive strength of which, in three aqueous solutions of hay, urine, beef-juice, and egg albumen, is only 1 to 400, while that of chromic acid is 1 to 3300.*

Effects on animals.—The results of various experiments on rabbits, etc. show that chromic acid, in concentrated solutions, is a pure and powerful corrosive of animal textures, effecting speedy and complete local disorganization. So actively does it destroy the vascular tunics, gelatinizing their fluid contents, that absorption is rendered impossible; these, by the merest contact with the acid, being converted into consolidated emboli, which choke the capillary passages and preclude further ingress. This view is confirmed by, or may be inferred from, the fact of the poison not being found in the blood or urine. If equal portions of muscular tissue and chromic acid be left in contact for about one hour, the whole is converted into a mass like burnt sugar, which is freely soluble in water, rendering it yellowish-brown.

Chrome sores.—Through the kindness of Messrs. White, of Shawfield, near Rutherglen, the largest makers of bichromate of potassium in this country, I had an opportunity lately of examining some of the "chrome sores" on the bodies of several workmen. These occur chiefly on the hands and exposed parts, and are said to arise from the salt coming in contact with a denuded cuticular surface. The first symptom is pain, succeeded by redness; and latterly the affected part assumes a papular or furunculoid form. After the lapse of some days, a cylindrical slough or core exudes from the centre of the swelling, leaving a deep pit with nearly vertical walls, the bottom of which generally extends through the cutis vera, and not unfrequently into or through some of the muscles. The sores are long of healing, doubtless from loss of structure, the salt acting like its acid, though with less intensity.

Chromic acid in this form has been said to have a strong propensity for the destruction of cartilage, inasmuch as the nasal alæ and septum, and even the larynx, of workmen employed in the manufacture of bichrome are frequently greatly corroded by it. The ulceration has been considered similar to that of tertiary syphilis, and bichloride of mercury recommended as an antidote, and, withal, this absurdity has been promulgated by a standard work on chemistry.† From experiments made with the acid on portions of the trachea of a cow, the reverse is proved to be the case. Indeed, chromic acid might rather be said to have a specific action on gelatine or muscle, because breaches of surface are here the rule, whereas ulceration of cartilage is the exception. The cause of the nasal and laryngeal affection is clearly the same as that of the other sores—a cuticular hiatus; and while there seems an additional reason why the nasal walls should be attacked more than other parts, still that is fully counterbalanced by the material of which they are composed resisting the action of the acid more; hence it is seldomer affected.

During respiration in an atmosphere contaminated with floating particles of the chromic salt, these are constantly brought in contact with the anterior nares, etc.; and, dissolving in the nasal secretion, set up irritation, which, if prolonged, results in abrasion of the mucous membrane. What follows is plain: each inspiration deposits a variable quantity of the salt upon the affected part, resulting in ulceration.

As a test for strychnia.—Chromic acid elicits the coloured reaction in a solution containing $\frac{1}{100000}$ of strychnia. The *modus operandi* is to put two or three

* Reprinted from the *Lancet*, vol. ii. (1871) p. 912.

* 'On the Relative Powers of Various Substances in Preventing Animalcules." Churchills.

† In Meadows's 'Prescribers' Companion' (page 152) potassæ bichromas is said to have been recommended as an antisyphilitic.

minims of the strychnia fluid on a white non-porous surface, then and a few needles of chromic acid, which instantly dissolve, imparting to the liquid their characteristic tint. One or two drops of *concentrated sulphuric acid* are now added, and the play of colour is at once evolved. With stronger solutions the result is very distinct, and in any case unfailing. In applying this test the above method must be strictly adhered to; because if sulphuric acid be added to the strychnia solution before the chromic acid, the latter will not dissolve, and the result is negative. Chromic acid does not give the coloured reaction with dilute sulphuric acid.

It is well known that bichromate of potassium, so commonly used for this test, does not always succeed. I have seen it fail in the hands of two professors—one a celebrated toxicologist—when attempting to show it to their class, and am not aware that any explanation of the cause of this frequent miscarriage has been given, though it seems to me as follows:—It is obvious from the fact of chromic acid giving the coloured test at all that to it alone the reaction is due when bichrome is used; that neither the potash in the latter, nor the sulphate of potash resulting from the addition of sulphuric acid, are indispensable agents in developing the reaction. Furthermore, as strong sulphuric acid is necessary both when using bichrome and chromic acid *per se*, it is evident that, when added to the first, the result is the formation of sulphate of potassium, water, and free chromic acid: indeed, this is exactly the method by which the latter is prepared, as shown in the following equation:—

$$K_2O\ 2\ CrO_3 + H_2SO_4 = K_2SO_4 + H_2O\ 2\ CrO_3.$$

The chromic acid, being thus liberated, oxidizes the strychnia, and the coloured reaction is afterwards developed by the strong sulphuric acid. But it may happen that the sulphuric acid, which might have proved strong enough for isolated chromic acid, is rendered too weak for bichrome in consequence of being partially neutralized by the base of the latter, and further diluted by the water, which, as seen in the formula, is generated by the hydrogen of the sulphuric acid combining with the oxygen of the potash, and this, I believe, is the most frequent cause of non-success of the test. With isolated chromic acid failure is of course impossible from such a source; and when used as described, the reaction is not only constant, but greatly more delicate. Another cause of lapsus with the bichrome, also applying in part to chromic acid, is seen in the following table of results:—

Bichrome added to solution of strychnia, then sulphuric acid added = much colour.
Sulphuric acid added to solution of strychnia, then bichrome added = considerable colour.
Sulphuric acid added to bichrome, then solution of strychnia added = almost no colour.
Chromic acid added to solution of strychnia, then sulphuric acid added = much colour.
Sulphuric acid added to solution of strychnia, then chromic acid added = a little colour.
Sulphuric acid added to chromic acid, then solution of strychnia added = almost no colour.

These results are just what might have been expected. It will be seen, as with chromic acid, that when sulphuric acid is added to bichrome, or *vice versâ*, succeeded by strychnia, the reaction is almost *nil*. Doubtless, from the loose and empirical manner in which this test is usually applied, its failure is frequently due to the above cause; and, indeed, from notes in my possession, I find this very method recommended.

Antidote.—In poisoning with chromic acid the best antidote is beef-tea, raw egg, milk, or any albuminous or gelatinous substance. A very handy and efficient antidote is a solution of ordinary painters' size.

Therapeutical properties.—I am not aware what effect on the system prolonged minute doses of chromic acid (which may be absorbed) would produce, though, from its strong coagulating properties, a general viscidity of the blood might be anticipated, whatever further consequences should arise. In the absence of such knowledge, it seems to me that it might be used with a fair prospect of success in the following cases, for some of which it is already recommended in works on materia medica;—As a hæmostatic; as a caustic to cancerous tissues, chancres, condylomata, hospital gangrene, phagedænic ulcers, bites of rabid animals, poisoned wounds, warts, hæmorrhoids, etc.; as a wash to allay fetid discharges; as a gargle in diphtheria: as an injection in ozæna, uterine catarrh. leucorrhœa and gonorrhœa; to disinfect cholera and fever stools, for which it is admirably adapted; as a preventive of suppuration, putrefaction, etc. In every case it must be used dissolved in water; and, except where a strong caustic effect is desired, in medical or surgical cases, the solution should not be stronger than half a grain to the ounce, and be succeeded immediately after gargling or injection by the application of pure water. I have used chromic acid to a limited extent in the five latter affections above specified with a fair measure of success; in gonorrhœa and ozæna the results are especially gratifying. Finally, I have no doubt that its remarkable antiseptic, disinfectant, and coagulating powers will suggest many applications in medicine, surgery and hygiene not above enumerated.

Glasgow, December, 1871.

THE CHINESE WHITE WAX INSECT.

In his recently-published volume, 'Travels of a Pioneer of Commerce in Pig-Tail and Petticoats, on an Overland Journey from China towards India' (Murray, 1871), Mr. T. T. Cooper gives the following account of this insect, a species of coccus:—Chemists have long known the so-called "vegetable wax," "Chinese wax" or "pela," also called "vegetable insect wax" or "vegetable spermaceti," but we have had no definite knowledge before of its history or mode of production. It was generally stated to be produced on certain trees by the puncture of a species of coccus. But Mr. Cooper supplies us with the first definite statement we have seen of what proves to be an extensive industry. Unfortunately, he does not appear to have secured specimens of the insects producing it, nor does he give us more definite information of the plant on which they feed than that it resembles our privet. Mr. Cooper describes the cultivation of wax as a source of great wealth to the province of S'zchuan, where it ranks in importance second only to that of silk. The eggs of the insect which produces the wax are imported annually from the districts of Hochin or Hoking and Why-li-tzou in Yunnan, where the culture of the eggs forms a special occupation, by merchants who deal in nothing else but pa-la-tan, "white wax eggs." The "wax-trees" are all uniformly cut down to a height of about eight feet, without a single branch, the stumps being as thick as a man's thigh. The clusters of eggs, about the size of a pea, enclosed in balls of the young leaves, are suspended to the shoots by strings, about the middle of March. By the end of the month the larvæ make their appearance, feed on the branches and leaves, and soon attain the size of a small caterpillar, or rather a wingless house-fly, covered with white down, with a delicate plume-like appendage, curving from the tail over the back. They are so numerous that the branches of the trees are whitened by them, and appear as if covered with feathery snow. The grub proceeds in July to take a chrysalis form, burying itself in a white wax secretion, just as a silk-worm wraps itself in its cocoon of silk. All the branches of the tree are thus completely coated with wax, an inch thick, and in the beginning of August are lopped off close to the trunk and cut into small lengths which are tied up in bundles and taken to the boiling-houses, where they are placed without further preparation in large caldrons of water, and boiled until every particle of the waxy sub.

stance rises to the surface; the wax is skimmed off and run into moulds, in which shape it is exported to all parts of the Empire. It would seem that the wax-growers find that it does not pay them to reserve any of the insects for their reproductive state, and hence the necessity of importing the eggs from Yunnan.

To this account, Professor Silliman adds the following notes in the 'American Naturalist' for November, 1871:—This insect wax is a definite compound somewhat resembling spermaceti in appearance, but not in composition, being a cerotic ether, known as cerotate of ceryl, of the formula $C_{59}H_{118}O_2$. It is crystalline, and of a dazzling whiteness like spermaceti, but more brittle and of a more fibrous texture. It does not completely saponify by boiling in potash water, but is completely decomposed when melted with potash, yielding cerotate of potassium and hydrate of ceryl. It is consumed in China for candles and also as a medicine. It melts at about 118° F. It does not appear clearly from Mr. Cooper's statements whether this wax is secreted by the insect, or is not rather an exudation from the stems of the trees punctured by the insect. Mr. Cooper plainly favours the former supposition; but other writers of more pretensions to science entertain an opposite view. The plant on which the Chinese coccus lives is stated to be *Ligustrum lucidum*. There are several sorts of vegetable wax, well known to chemists and new to commerce, and we find it stated by the Rev. Justin Doolittle, in his 'Social Life of the Chinese,' that the "vegetable tallow" of China is obtained from the seeds or kernels of the so-called "tallow tree." But he also states that the tallow is hardened by a very hard white wax brought from the western or north-western provinces of China, which is the very wax described by Mr. Cooper. The "tallow" is not a wax in chemical constitution, and is the product of a shrub known as *Stillingia sebifera*. The American myrtle-wax (bayberry tallow) is a solid fat, melting at about 118° F., and contains a large quantity of palmitic and a small quantity of myristic acid. From its high melting-point and general physical and chemical properties, we might infer that the white wax of China was the product of the coccus rather than of the plant on which it feeds, seeing the properties alluded to are more like those of beeswax than of vegetable wax known as such.

Professor Westwood, in his 'Modern Classification of Insects,' vol. ii. p. 449, says that "The *Coccus ceriferus*, Fabr., described by Anderson in his letters from Madras, and by Pearson in the Phil. Trans. 1794, is employed in the production of a white wax, the body of the females being enveloped in a thick and solid coat of wax;" and the editor of the 'American Naturalist,' the well-known entomologist, Mr. A. S. Packard, jun., adds, "It is now known that this wax, as well as that of the honey-bee, is secreted by numerous minute excretory sacs or follicles lodged just beneath the skin of the abdomen."

COMPARATIVE VALUE OF CHLORAL HYDRATE AS A HYPNOTIC.

Dr. J. Hawkes, the assistant resident physician at the Hanwell Asylum, furnishes to the *Lancet* of January 6th some particulars of his experience of the results which have followed the employment of chloral hydrate compared with those obtained by drugs which it has in a measure superseded. He evidently considers it to be a therapeutic agent that requires to be administered with great caution. Although in some cases a draught containing half a drachm given at bedtime, or a dose of mixture containing from twenty-five grains to half a drachm given three times a day, has allayed the chronic restlessness and excitement, in other cases, of paralysis accompanying mania in rather elderly persons, with feeble circulation and impaired nutrition, he has been compelled to suspend its administration from a decided conviction that it was hurtful, and that any amount of insensibility produced by it was purchased at too dear a rate, being followed by gradual failure of strength and a corresponding advance of the paralytic symptoms. The sedatives relied on by Dr. Hawkes when chloral hydrate is contra-indicated are—liquor opii sedativus, combined with tinctura hyoscyami, in the proportion of twenty-five to thirty minims of the former to a drachm and a half of the latter, tinctura hyoscyami alone, or in combination with tinctura digitalis. In one case of delirium tremens thirty minims of liquor opii sedativus with tinctura hyoscyami procured some hours' sleep, after thirty grains of chloral hydrate had entirely failed. Dr. Hawkes concludes by saying that chloral hydrate is by no means a safe or constant remedy, and that he scarcely thinks the public, who so largely consume it, can be sufficiently aware of its insidious and dangerous qualities.

[Although these observations are mainly of medical interest, the subject is of such importance that it has been thought advisable to give this brief abstract, as a supplement to the information already published concerning chloral hydrate.—ED. PHARM. JOURN.]

THE WELL WATERS AT WEST NEWTON.

The following results of a series of analyses of water from wells at West Newton have been published in the *British Medical Journal* for January 6. They show a universal pollution by infiltrating sewage from cesspools and similar receptacles, indicated not only by the large amount of total solid contents and chlorides, but also by the excessive proportion of organic nitrogen, amounting from three to eight times the maximum quantity found in water of good quality:—

	Total solid contents. Grains per gallon.	Organic and volatile.	Fixed.	Free ammonia. Parts in 100,000.	Organic nitrogen. Parts in 100,000.
Rectory stable pump	68·6	11·2	57·4	·023	·023
Rectory cistern	92·4	11·9	80·5	·003	·020
Dye	88·2	13·3	74·9	·009	·063
Boughen	30·1	5·6	24·5	·006	·036
Melton	48·3	4·9	43·4	·002	·027
Smith	93·8	14·7	79·1	·003	·034
Maximum quantities in good water	—	—	—	·002	·008

If it be true that typhoid fever and similar diseases are caused by the habitual use of such waters for domestic purposes, the prevalence of these diseases in the neighbourhood of Sandringham and West Newton would seem to be easily accounted for.

DINNER TO EMPLOYÉS.

On Saturday, the 6th instant, one of those festivals which do so much to preserve good feeling between employers and employed was held at the Bridge House Hotel, London Bridge, where, upon the invitation of Messrs. Wright, Sellers and Layman, their employés met those gentlemen at dinner. About thirty-six sat down, and a very pleasant evening was spent. The chair was occupied by Mr. W. V. Wright, the senior partner in the firm.

Poisonous Effects of Belladonna applied Externally.—In the *Revue Médicale de Toulouse* M. Giscaro records two cases in which persons had suffered from the poisonous effects of belladonna, applied externally. In one case, where a small patch of belladonna, the size of a two-franc piece, had been applied to the temple for a neuralgic pain, the patient eight hours afterwards showed decided symptoms of atropia poisoning, which lasted two hours. In the other case, where an excessive quantity of ointment had been used for a uterine affection, similar symptoms came on in one hour, but quickly disappeared with the removal of the dressing.

The Pharmaceutical Journal.

SATURDAY, JANUARY 13, 1872.

Communications for this Journal, and books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*
Instructions from Members and Associates respecting the transmission of the Journal should be sent to ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*
Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

SHIPS' MEDICINE CHESTS.

REPORTS have recently been circulating among the shipping community to the effect that bad or adulterated drugs are frequently supplied to the medicine chests of our merchant ships. This is an important question, inasmuch as more than 27,000 ocean-going ships leave the ports of the United Kingdom every year, so that the subject is a matter of special interest to many of our readers, particularly those who reside in the ports of London, Liverpool and Glasgow. It is well known that the Marine Department of the Board of Trade authorize a list of medicines and medical stores, which was, we believe, first used when the Merchant Shipping Act of 1854 came into operation. This list was entirely revised and much simplified in 1867 under the terms of the DUKE OF RICHMOND's Act. All drugs likely to be harmful in the hands of a non-professional person were eliminated from the scale; simplicity was studied in the sort of medicines chosen, and a Medical Guide, written strictly up to the scale of medicines ordered, was compiled by Mr. HARRY LEACH for the use of ship captains, and authorized by the Board of Trade to be carried with the chest in all merchant ships trading to any place out of the United Kingdom.

The revised scale (as well as the book of instructions) is, of course, capable of further improvement; but the general verdict as regards both has been very favourable. The subject to which, however, we desire specially to refer, viz. the adulteration of the drugs supplied to merchant ships, has formed the text of a leading article which lately appeared in the columns of the *Shipping Gazette*, the "JUPITER" of journals among the mercantile marine community. The statements made as to adulteration are very vague, and, indeed, appear to be mere rumour. It is possible, however, that some of our readers may be able and willing to enlighten us on the matter; and it need hardly be said that we shall prefer to receive facts rather than opinions. Meanwhile, it is proposed that all medicines and medical stores sent to sea for the use of ships' crews shall be examined officially and supplied from bonded warehouses, in accordance with arragements now in force as to the supplies of lime and lemon juice. The Board of Trade may, indeed, under the terms of the last Merchant Shipping Act, appoint inspectors to examine all medicines shipped; but this section has been, up to the present time, practically a dead letter.

The new Merchant Shipping Code (which may or may not become law during the next ten years) proposes that all medicines etc. shipped shall be brought under the Adulteration of Food and Drinks Act. Whether either or neither of these plans be adopted, it is eminently the duty of chemists in maritime towns to contemplate this question in all its bearings. We know that there are some in their ranks who particularly desire official interference and supervision. But the necessity for such interference must be plainly stated, and still more plainly proved. Analytical, as well as other skilled evidence of an overwhelming kind was in 1867 brought to show that the so-called lime juice sent to sea was in many cases a filthy or an inert compound, and then, but not till then, the Government stepped in, and genuine antiscorbutic is now ensured to the sailor. If direct legislation as to medicine and medical stores be required, we believe that an equally direct remedy is not far to seek. But the facts must be conclusive, and the evidence very strong, before systematic inspectional supervision can be fairly considered necessary.

THE CHEMISTS' BALL.

THIS pleasant *réunion* of chemists and their friends is announced to take place on Wednesday next, the 17th instant, at WILLIS's Rooms, King Street, St. James's. The list of stewards is, as usual, very influential, and comprises a goodly number of provincial pharmacists. Mr. T. D. WATSON, the indefatigable honorary Secretary of former years, is, we regret to learn, prevented by domestic affliction from filling this office on the present occasion. The Committee have, however, succeeded in enlisting the services of Professor ATTFIELD as chairman, Mr. R. BETSON WARRICK (of Messrs. WARRICK BROTHERS) as Secretary, and Mr. THOMAS BILLING, the graceful M.C. of previous years, occupies the post of Treasurer. We may safely predict that the Ball of 1872 will be as successful and as enjoyable as any that have preceded it.

To prevent disappointment, immediate application for the remaining tickets should be made to either of the following gentlemen:—Mr. RICHARD BREMRIDGE, 17, Bloomsbury Square, W.C.; Mr. THOMAS BILLING, Hon. Treasurer, 143, New Bond Street, W.; Mr. R. BETSON WARRICK, Hon. Secretary, 2, Verulam Buildings, Gray's Inn, W.C.

THE LEGAL RELATIONS BETWEEN SURGEONS, APOTHECARIES AND PHARMACEUTISTS.

THE following remarks on the relations between surgeons, apothecaries and pharmaceutists as defined by law, are taken from an "Abstract of the Principal Laws affecting the Medical Profession," by R. G. GLENN, Esq., LL.B., Barrister-at-Law, which is prefixed to the Medical Directory for 1872 recently issued by Messrs. J. and A. CHURCHILL.

"A penalty of £20 may be inflicted, for every such offence, upon any person acting or practising as an apothecary in England or Wales, without the licence of the [Apothecaries'] Society, and a penalty of £5 for every such offence, upon any person acting as assistant to an apothecary to compound and dispense medicines, without having obtained the certificate of the Society. The Society can, therefore, afford no protection against practice by bone-setters, and that class of persons, but it can supply an efficient safeguard against irregular practice by chemists and druggists, for it has been held that a chemist who not only sells but also applies and administers medicines, in the ordinary course of attending patients, practises as an apothecary, and is not exempt from the penalty."

"A medical man keeping an open surgery for the sale or compounding of poisons, must not engage an unqualified assistant who is not registered under the Pharmacy Acts. No person may, under a penalty of £5, act as assistant to an apothecary in compounding and dispensing medicines without first passing an examination and obtaining a certificate from the Apothecaries' Company."

"A medical practitioner, not being a legally qualified apothecary, is prohibited from selling or keeping an open surgery for retailing, dispensing, or compounding poisons, under a penalty of £5, unless he was either registered before August 11th, 1869, or has been registered since that date, after passing an examination in pharmacy in order to obtain his diploma for such registration. A legally qualified medical practitioner may dispense to his patients medicines containing poison, but such medicine should be labelled with his name and address, and the ingredients thereof, and the name of the person to whom it is sent should be entered in a book to be kept by him for the purpose. A medical man who keeps an open surgery, must conform to the same regulations as to the sale and compounding of poisons as are imposed upon chemists and druggists, under a penalty of £5 for the first, and £10 for each subsequent offence."

MEDICAL HONOURS.

THE discussion of the question as to the honours that the medical men in attendance on the PRINCE OF WALES should receive from the nation, which was perhaps somewhat prematurely started by the *Lancet* a fortnight since, has developed into a general consideration of the kind and degree of honours most suited for the recognition of great eminence and distinguished services in the profession of medicine. In the article referred to an opinion was expressed that a more liberal creation of medical baronets from time to time would stimulate the exertions of scientific men, and that when, as in the case of one of the gentlemen in question, a baronetcy has already been conferred, some means should be found for conferring further honour. The *Times*, considering that there was here a hint for the creation of medical peerages, objected in a leading article that medical talent is a great speciality, and much less likely to descend with the blood than legislative, military, or even legal talent. It is more than probable that the son of a physician will not be a great physician, if a physician at all, while it may be the merest chance that he will have an estate to support the title. The *Times* considers that to be the temper of the age as well as its plain requirements, and that, while accepting the hereditary principle, it does not wish to see it further developed. The *British Medical Journal* adopts the same view, and makes the following remarks on the subject:—

"It has always been felt in our profession that hereditary honours carry with them elements of possible embarrassment. They imply the possession of a large estate, and the necessity of a stringent settlement of a large part of that estate; and, honourable as is the distinction of a baronetcy, it has been declined, or its acceptance postponed, more than once, even by living men —among others, by Sir Henry Holland and Sir Thomas Watson. Sir James Clark was a Knight of the Bath as well as Baronet; but this is not an order which usually recognises or implies the existence of peaceful scientific distinction. The dignity of Privy Councillor and the title of Right Honourable have many times been employed to recognize civil services to the State and a high order of ability. It is not hereditary, and it does not pledge posterity. It will not supersede the propriety of conferring baronetcies in suitable cases, but it may offer a desirable addition or alternative. It implies that its possessor is a person who enjoys the confidence of the sovereign, and is fitted to be called into counsel on proper occasions. Of course the title is mainly honorary; but it is one of the most honourable, and, as we think, one of the most appropriate which a medical man could receive."

INFRINGEMENT OF THE PHARMACY ACT.

IT will be seen by a report at p. 575, that the unsatisfactory result following a recent prosecution at Croydon for a breach of the Pharmacy Act, in the sale of poison insufficiently labelled,* has been followed by fresh proceedings against the defendant for selling poison without being on the Register. On this occasion the Pharmaceutical Society has been the plaintiff, and a decision has been obtained much more in accordance with the spirit of the Act and with the public welfare.

SIR ROBERT CHRISTISON, BART.

THIS distinguished pharmaceutist and physician will be entertained at a public dinner, in Edinburgh, on the 23rd proximo. The occasion is that of the fiftieth anniversary of his induction as a Professor in the University. Lord Justice General INGLIS will preside, and the list of croupiers and stewards, including many names well-known in the departments of medicine, surgery, and pharmacy, gives promise of a success quite commensurate with the high merits of the NESTOR of the Edinburgh School. Representatives of nearly every university in the United Kingdom have signified their intention of assisting on the occasion; while the demand for tickets, on the part of the general public, is already so great that all who are desirous of being present should lose no time in applying to the Honorary Secretary, Mr. J. HOPE FINLAY, W.S., 52, Frederick Street, Edinburgh.

* See *ante*, p. 417.

Proceedings of Scientific Societies.

SOCIETY OF ARTS.

DYES AND DYE-STUFFS OTHER THAN ANILINE.*

BY DR. CRACE-CALVERT, F.R.S.

LECTURE IV.

Quercitron, Fustic, Persian Berries, Weld, Aloes, Turmeric, Annatto, Ilixanthine, Lakao, Tannin matters, Gall-nuts, Sumach, Divi-divi, Myrobalans, Catechu.

(*Continued from page* 538.)

We shall now pass to the study of another colouring matter, called *old fustic*. The tree which supplies it is called *Morus tinctoria*, and grows in the Brazils, Mexico, and in Jamaica, Cuba and other islands of the West Indies. It arrives in this country in logs of various sizes. Dyers prefer those which are dense, are not worm-eaten, and which are of a fine orange-yellow tint in the inside.

In this case again my master, M. Chevreul, was the first to isolate the two colouring matters which the wood contained. To the first of these Wagner gave the name of *morintannic acid*, and to the second that of *moric acid*. To extract these, rasped fustic is boiled twice with water, and the solution concentrated to the state of a syrup, when after a few days a crystalline deposit takes place, which is separated, washed rapidly with cold water and pressed. To separate the two colour-giving principles, the pressed mass is treated with boiling water, which leaves the moric acid as an insoluble mass, while the morintannic acid is dissolved. The moric acid is treated with weak hydrochloric acid, to remove some lime salts; it is then dissolved in alcohol, from which it crystallizes in the form of yellow needles. To obtain the morintannic acid which was dissolved, the solution is concentrated, when the colouring matter crystallizes out, and only requires recrystallizing once or twice from acidulated water to give it almost pure. It forms yellow crystals, soluble in alcohol, which have the formula $C_{13}H_{10}O_6$. It gives a greenish-black precipitate, with sulphate of protoxide of iron, and, with salts of lead, a yellow precipitate soluble in acetic acid. It is decomposed by concentrated alkalies, and when boiled with zinc and sulphuric acid, the solution assumes a very bright red colour, due to the transformation of morintannic acid into two most interesting substances, *phloroglucine* and *machromine*.

Moric acid, though insoluble in water, is freely soluble in alcohol and ether, but is insoluble in bisulphuret of carbon. It is soluble in alkalies, to which it gives a yellow colour, and from this solution it is reprecipitated by the addition of an acid. Perchloride of iron communicates to its alcoholic solution an olive-green shade. It gives yellow precipitates with salts of zinc, tin, lead and alumina, and a dark green precipitate with copper. It has the formula $C_{12}H_8O_5$.

Old fustic is especially employed for dyeing wools in yellow or olive-green shades. They are mordanted with a salt of alumina for yellow, or with a salt of iron for green. By the employment of salts of copper and other mordants a variety of shades can be obtained. It is much used by dyers, but only to a limited extent by calico-printers.

Young fustic belongs to the same genus as sumach, of which I shall speak further on, and its botanical name is *Rhus Cotinus*. It grows in the West Indies, and in France and the southern parts of Europe. It is found in commerce in the form of small logs and crooked branches. Young fustic contains a tannin matter and three colour-giving principles, a red, a brown and a yellow. The yellow colouring matter, when isolated and crystallized, bears the name of *fustine*. It is soluble in water, alcohol and ether. Alkalies communicate to it a fine orange hue. It rapidly oxidizes when exposed to the atmosphere, assuming an orange colour. A decoction of the wood is affected by the alkalies and air in the same manner as fustine. It gives a bright orange precipitate with lime and baryta waters, and a similar coloured precipitate with chloride of tin. Persulphate of iron yields with it an olive-green precipitate. Young fustic dyes wool mordanted with salts of alumina a fine orange colour, but it is easily affected by light; its chief employment is in conjunction with cochineal, to the red colour of which it imparts a brilliant orange hue. It is much used in Turkey and the Tyrol by tanners, to impart to their leather an orange-yellow colour.

Persian berries, which are extensively employed by woollen and mixed fabric dyers, calico-printers, paper-stainers and leather-dressers, are the berries or fruit of a genus of plants called *Nerprun*, which grows freely in France, Spain, Turkey, Persia, etc. Generally speaking, the berries are gathered before they are quite ripe, which is the reason why the berries, which are the size of a small pea, have a yellowish-green shrivelled appearance. The berries only give good results when recently gathered; after one or two years they lose a great deal of their value, not yielding to the dyers such brilliant hues. The yellower they are, the less price they command in the market. They bear among the dealers the names of the countries from which they are imported; thus there are Avignon berries, Spanish berries, Turkish berries and Persian berries. The latter are the best, and are obtained from the *Rhamnus amygdalinus*. Among dyers and calico-printers all the varieties are called Persian berries.

The yellow decoction of the berries assumes an orange-yellow tint with alkalies, which is not changed on the addition of an acid. Lime-water gives it a greenish hue, persulphate of iron a greenish-yellow. Chloride of tin gives a greenish-yellow coloration, and a slight precipitate.

Sir Robert Kane succeeded, some years ago, by treating the berries with ether, in extracting a substance, crystallizing in fine golden-yellow crystals, to which he gave the name *chrysorhamnine*, and assigned to it the formula $C_{23}H_{11}O_{11}$. He found that when a solution of this compound was boiled in the air or in presence of an oxidizing agent, it became converted into a substance which he named *xanthorhamnine*, to which he gave the formula $C_{23}H_{12}O_{14}$.

Since then, several eminent chemists have examined into the nature of these colouring matters, among whom may be mentioned Bolley, and especially Lefort and Schützenberger.

From their researches the following facts may be gathered. Lefort, in 1866, succeeded in isolating two colouring matters from the berries, which he named *rhamnagine* and *rhamnine*. Rhamnagine is soluble in water, and may be obtained under the form of crystals, while rhamnine is an insoluble yellow amorphous powder. In researches published in 1869, he found that rhamnagine was identical in composition with rhamnine, and that only a molecular change took place in the transformation of rhamnagine into rhamnine, such as we are all aware starch undergoes on conversion into dextrine. He supported this view by analyses, showing that both these substances had the same formula, namely, $C_{24}H_{32}O_{14}$. The researches of Schützenberger further proved that, under the influence of weak sulphuric acid, rhamnagine is decomposed into a peculiar sugar and a substance to which he gave the name *rhamnatine*, thus showing that rhamnagine is a glucoside. The following formulæ show the decomposition which takes place:—

$$\underset{\text{Rhamnagine.}}{C_{24}H_{32}O_{14}} + \underset{\text{Water.}}{3H_2O} = \underset{\text{Rhamnatine.}}{C_{12}H_{10}O_5} + \underset{\text{Sugar.}}{2(C_6H_{14}O_6)}.$$

From these results it would appear that the real colour-giving principle is rhamnagine, and that rham-

* Cantor Lecture, delivered Tuesday, Feb. 28. Reprinted from the *Journal of the Society of Arts*.

nine and rhamnatine, which are insoluble in water, are only products of decomposition.

Decoction of Persian berries is principally used in print works for producing bright yellows and greens, on prepared tin cloth, in steam styles. To obtain yellows, the extract is mixed either with a little red mordant (sulpho-acetate of alumina) or with a little muriate of tin. The mixture is thickened, printed on, and the fabric steamed. To produce greens, the decoction of berries is mixed with prussiate of tin, the mixture is thickened and printed on the fabric, which is then steamed, when the yellow of the berries and the Prussian blue which is formed unite to produce green on the fabric. The decoction of berries is very apt to enter into fermentative decomposition, and thereby become ropy; this may be prevented by the addition of a little carbolic acid.

A very fine brilliant yellow lake is produced from a decoction of Persian berries, the manufacture of which was kept secret for a long period by the Dutch. It consists in adding pure carbonate of lime to the decoction, when the lime salt falls, carrying with it the colouring matter of the decoction. The yellow lake thus produced is moulded into small lumps, which are dried in the shade.

There is a variety of mignonette which used to be cultivated in England and France, called weld, its botanical name being *Reseda luteola*. This plant yields a most valuable yellow dye when fixed on wool by means of alum, not only because the colour is exceedingly brilliant, but because it is very solid, resisting light, heat and acids. Alkalies only communicate to it a slight orange tint. Its colouring matter was extracted by M. Chevreul many years ago, and he gave it the name of *luteoline*. He obtained it in yellow transparent crystals. By the action of oxidizing agents, such as bichromate of potash, it assumes a magnificent yellow tint, identical to that produced with it in cotton fabrics.

M. Moldenhauer has since studied luteoline, to which he assigned the formula $C_{20}H_{14}O_8$. It is slightly soluble in water, but very soluble in alcohol. It dissolves without decomposition in strong sulphuric acid, and yields, even when greatly diluted with water, a fine green colour with perchloride of iron. Schützenberger, who has lately studied this body, states that when mixed with water and heated to a temperature of 480° F. in sealed glass tubes, it decomposes into what he considers pure luteoline and resin. The luteoline is found in crystals adhering to the sides of the tube, while the resin collects at the bottom. He states also, that if a decoction of the berries is boiled with weak sulphuric acid, a new yellow colouring matter is produced, which possesses a high dyeing power as well as a pure yellow hue.

The introduction of quercitron and flavine is the principal reason why weld has nearly disappeared from the market.

Aloes is imported into Europe from Bombay, Barbadoes, Jamaica and the Cape of Good Hope in the form of resinous masses, varying considerably in size. It is the dried sap or juice of several varieties of aloes, of the family of *Asphodels*.

Dr. Stenhouse, who has examined this substance, has succeeded in isolating two compounds; one, which crystallizes in yellow prismatic needles, is soluble in cold water and alkalies, the solution having an orange tint. It has an intensely bitter taste. He has given it the name *aloïne*, and assigns to it the formula $C_{17}H_{18}O_7$.

The second compound, which may be considered as the resin of aloes, has received the name of aloëtine. Dr. Schunck has produced from aloes a yellow dye, called *chrysammic acid*, which will probably be yet extensively used. It is prepared by heating in a water-bath eight parts of nitric acid with one of aloes; when the violence of the action has ceased a second part of aloes is added. The application of heat is continued until hyponitric fumes cease to be given off. The mass is then poured slowly into a large bulk of water. The chrysammic acid falls in flakes to the bottom of the vessel. These are washed with water until they assume a fine purple colour. The formula of this acid is $C_7H_22(NO_2)O_2$. It forms small golden-yellow scales, soluble in alcohol and ether. Although but sparingly soluble in water, it communicates to it a magnificent purple tint, and its dyeing power is considerable. Mr. Saac has made a great number of dyeing experiments with chrysammic acid, and has produced with it a variety of shades. He believes that one day they will become commercial.

Turmeric is the root or underground stem of the *Curcuma tinctoria*, a plant which grows abundantly in the East Indies. It is imported principally from Bombay, Java, Batavia and Barbadoes. That from Bombay is the most valuable. It is ground and sold to the dyers in the state of a fine powder of a remarkably brilliant orange hue, and of a strong odour. Vogel and Pelletier succeeded in extracting from it a colouring matter, to which they gave the name of *curcumine*. M. Lepage has, however, given the best process for its extraction. The ground roots are treated with bisulphuret of carbon, which dissolves a volatile oil and resinous matters. The root is then dried and acted on by a weak alkaline solution, which dissolves the curcumine. To liberate it, the alkaline solution is neutralized with an acid, when the curcumine falls as a precipitate. This is collected, dried, and dissolved in ether, from which it separates under the form of small, brown scales, which yield on trituration, a brilliant, yellow powder.

Turmeric is seldom used as a dye, owing to its colour being so easily affected by alkalies, a fact well known to chemists, as they often employ it to ascertain the presence of a trace of free alkali or boracic acid in solutions. It is used in India to flavour rice, and by the natives to colour their skin.

Annatto is the pulpy part of the seeds of the *Bixa Orellana*, which grows in South America. It is imported into this country from Mexico, Brazil, the Antilles, and especially from Cayenne, in masses covered with leaves, and varying in weight from 5 to 20 pounds. It is also imported in casks, weighing 4 or 5 cwt., as a homogeneous paste of the consistency of butter, and often having a repulsive odour of urine, which, it is stated, is added by those who store it, to keep it moist and to impart to it a richer hue.

At Cayenne, when the fruit of the Bixia is ripe, it is gathered, coarsely crushed, and thrown into water, where it remains for several weeks. By this means the pulpy matter is separated from the kernel. It is next strained through a coarse cloth, and the colouring-matter gradually subsides. It is then collected, and the excess of water evaporated, until it assumes a pasty state, when it is exposed to the atmosphere in the shade until sufficiently dry to be shipped. The powder so prepared, and especially at Cayenne, is comparatively inferior, owing to the mass fermenting and producing matters which prove injurious in the drying process. The following analysis may be taken as the average composition of such qualities of annatto:—

Water	72·25
Leaves	3·85
Starch, mucilage, woody fibre	18·30
Colouring matter	5·60
	100·00

Some thirty years ago a M. du Montel introduced at Cayenne some marked improvements in the manufacture of annatto. He suppressed the crushing of the seeds, separated the colouring matter by water, and prevented the fermentation by the addition of some chemical fluid. By this means he obtained annatto in a minute state of division, and having a very beautiful red colour, which is imported into this country in the form of small tablets, which are much used for colouring cheese.

An alkaline solution of annatto gives an orange precipitate with acids, alum or sulphate of protoxide of iron, a yellowish-brown precipitate with salts of copper, and a lemon-coloured precipitate with chloride of tin.

The colouring-matters of annatto have been studied by MM. Chevreul, Kerndt and Bolley. It contains two colouring-matters, one a yellow, which is soluble in water and alcohol but insoluble in ether, and which gives a yellow colour to cloth mordanted with alum. It has received the name *orelline*, and its formula is $C_{12}H_{22}O$. According to Kerndt's statement, however, it is only a product of the decomposition of the second colouring-matter, the real colour-giving principle of annatto being *bixine*, $C_5H_6O_2$. Bolley proposes the following method to obtain bixine:—The best quality of annatto from Cayenne, after having been washed and dried, is boiled with concentrated alcohol; the alcoholic solution is evaporated to dryness, and placed to digest with ether, which dissolves a part of the residue, leaving a bright red powder, insoluble in water but soluble in soap and alkalies, to which it imparts an orange tint, and yields a dark blue colour with sulphuric acid.

The use of annatto in print and dye-works is rather limited, its chief employment being to modify the shades of other dyes, such as certain tints of yellow produced by fustic or quercitron. It is also used to give a bottom to cotton before it is dyed with safflower or cochineal. In the production of oranges in steam styles annatto is now entirely superseded by *aurine*, a colour derived from carbolic acid. It is still often used in dyeing a low class of cotton yarns. The yarn is dipped in an alkaline solution of annatto, and then passed through a weak solution of oil of vitriol, which precipitates the bixine in the fibre. It is then only necessary to wash the cotton to complete the operation. If an orange-yellow tint is required, the cotton is previously mordanted with tin.

(*To be continued.*)

Parliamentary and Law Proceedings.

Croydon County Court.—*Monday, January 8th*, 1872.

Pharmaceutical Society of Great Britain *v.* Harrington.

Mr. Flux appeared for the plaintiffs, and stated that the action was brought to enforce a salutary Act of Parliament regulating the sale of poisons, and that the penalty did not pass to the plaintiffs, but would be dealt with as one of her Majesty's Secretaries of State might direct, so that in the institution of the proceedings there was no other motive than in the interests of the public to compel the defendant to comply with the law by causing himself to be registered, if he were, in fact, entitled to be so, or by desisting from the sale of poisons.

The Judge pointed out that, according to his opinion, the particulars of demand should have stated that the defendant was not a duly registered person.

Mr. Flux explained that the particulars were framed in accordance with those in former similar actions, as to which no objection had been taken, but expressed his readiness to comply with the suggestions of the Court to have the particulars amended. They were amended accordingly.

Mr. George Hayward, of Croydon, proved that on the 7th November last he caused the witness Stent to purchase at the defendant's shop one pennyworth of oxalic acid, also that he examined and tested the contents of the packet purchased, and found them to consist of oxalic acid; that he had produced the packet to the magistrates on a summons which charged the defendant with having sold oxalic acid improperly labelled; that the packet had been retained by the magistrates' clerk; and that the defendant had admitted that he had sold oxalic acid and had been convicted.

The Judge suggested that the proceedings before the magistrates should be produced, and the magistrates' clerk examined.

Mr. Flux assured his Honour that he had caused inquiry to be made of the magistrates' clerk, and been informed that there were no records whatever of the conviction, and that any person who was present in Court and heard the conviction could give as good evidence as himself of the fact of it, wherefore he had abstained from troubling the magistrates' clerk to attend as a witness.

His Honour stated that under the circumstances he would take the evidence of the witness in the box.

George Stent was then called, and proved the purchase of the oxalic acid at the defendant's shop; that the shop was an open one, like chemists and druggists' shops usually are; that he had handed the oxalic acid to Mr. Hayward, and that it was labelled with the word "poison," and nothing more.

Defendant contended that he was a duly qualified chemist and druggist, although not registered within the meaning of clause 2, and was not liable to a penalty; also that his conviction before the magistrates for the offence of selling the packet exonerated him from further penalties, and he produced certificates according to the Pharmacy Act, signed by himself as a duly qualified medical practitioner.

Mr. Flux replied, that if the defendant were in fact entitled to be registered, his proper course was to secure registration by presenting his certificates to the Registrar appointed under the statute, and paying the proper fees, and read to his Honour the various clauses in the Act of Parliament bearing upon the case, and showing that a penalty had been incurred.

The Judge expressed his opinion that the plaintiffs were clearly entitled to recover the penalty, and suggested that the justice of the case might be met by the defendant being ordered to pay the costs of the day, and the case standing over until a future Court, in order to afford the defendant an opportunity of presenting his certificates, and paying the fees; and that if the defendant pursued that course, the plaintiffs might allow the proceedings to drop.

Mr. Flux said that he had no doubt that the course suggested by his Honour would be willingly acquiesced in by those who instructed him.

An order was made accordingly.

Reviews.

Travels of a Pioneer of Commerce in Pigtail and Petticoats: or, an Overland Journey from China towards India. By T. T. Cooper. London: J. Murray. 1871.

The object placed before him by Mr. Cooper in his travels, was to establish a route between Calcutta and Shanghai, through Assam and Eastern Thibet, and thus open out to English commerce and enterprise a hitherto almost unknown region. In this he has not yet been entirely successful. In the present volume Mr. Cooper narrates his adventures in his attempt to accomplish the journey, starting from Hankow on the Yang-tse-kiang, in which he penetrated as far as the great river Lant-sang-kiang, which flows southwards from the mountains of Eastern Thibet, but was then compelled to return. Two years later, the same enterprising traveller set out from Calcutta up the valley of the Bramapootra, but was again driven back from the borders of Thibet. Whether the route will be of great commercial importance, should it ever be opened, is still quite in uncertainty.

The Thibetans are large consumers of tea, which at present they get entirely from China; and Mr. Cooper thinks that the transfer of this trade to our Indian planters in Assam, depends mainly on the policy adopted by our Government. The Bramapootra appears to offer a natural and most admirable means of communication between the two countries.

The narrative of Mr. Cooper's expedition is not devoid of exciting adventure, frequently among half-savage tribes who had never before seen a European; not the least alarming incident being his experience of being forcibly married, *nolens volens*, to a young damsel who persisted in following him many days; and, when at last he sent her home to her friends, the conditions were hardly improved by the arrival of her mother, who, according to the custom of the country, had, with the consent of her husband, come to supply her daughter's place.

The border-land between China and Thibet is a very important watershed, the source not only of great rivers like the Yang-tse-kiang and the Bramapootra flowing to the east and west, but of others also, flowing southwards, as the Irrawaddy and the Lant-sang-kiang; the mountain-ranges rising to a considerable elevation, and intersected by deep and picturesque gorges. The inhabitants are Thibetan, rather than Chinese, in their habits, though a large portion of Eastern Thibet was, some years ago, annexed to the Celestial Empire.

Mr. Cooper's volume would have had greater value in a scientific point of view, had he possessed a more accurate knowledge of the natural productions of the countries he visited; these are seldom described in a manner that conveys much information to the botanist or the zoologist, though many of his observations are interesting as being those of an observant and intelligent traveller. In the province of S'z-chuan, he passed through the country which produces the greater part of the Chinese white wax of commerce,—the wax being an exudation resulting from the attacks of a certain insect on the leaves of a certain tree; but, though the process of its manufacture is described with considerable minuteness, we are unable to identify, from Mr. Cooper's account, either the insect or the tree.*

The following is a description of the manufacture of the "brick-tea" of Thibet, which is spoken of as giving "employment to thousands engaged in the manufacture and portage of tea from Ya-tsow to Ta-tzian-loo:—The tree from which this peculiar kind of tea is manufactured grows chiefly along the banks of the Ya-ho, and, unlike that which produces the tea exported to Europe, is a tall tree, often 15 feet high, with a large and coarse leaf. The first quality is gathered in June and July, or shortly after the commencement of the summer rains in the end of May, when the leaf is about an inch long. When gathered, it is spread in the sun till slightly withered, and then rolled with the hand till moist from the exudation of the sap. In this state it is rolled into balls about the size of a large teacup, and laid up till it ferments. It is then ready for the wooden brick-moulds, which are made with the ends movable and fastened by pegs. The moulds, when filled, are dried over charcoal fires until the tea is baked into a tough solid mass. When taken from the moulds, the bricks are ready for delivery to the merchants of Ya-tzow" (p. 172).

At the frontier town of Atenze, Mr. Cooper found in the drug-shops an article known as the "grass-caterpillar," to which is attributed the virtue of reproducing youthful vigour. "The body is yellowish, like the Australian edible grub, and resembles a common caterpillar, about $1\frac{1}{4}$ inch long, but with a seeming trunk, $1\frac{1}{2}$ inch in length, exactly like a stem of dried grass;" this "trunk" being, in reality, a parasitic fungus (*Sphæria sinensis*), which grows from the caterpillar's head.

The volume is illustrated with some well-executed woodcuts and a map.

* See page 569.

Commentar zur oesterreichischen Pharmacopoe. By Dr. J. C. Schneider and Dr. A. Vogl.

Third Notice.

Our third notice opens with the fifth Order of the classification, viz. "Folia," and we give a short outline of the general introduction to this part, as it will afford a just idea of the scientific treatment visible throughout the book.

Folia.

It is not difficult to recognize and to distinguish these remedies, but their characteristics must be carefully collated and tested. Frequently, and especially when only fragments of leaves are at disposal, the microscope becomes indispensable, as alone affording an insight into the organization of the leaf or the distribution of certain substances.

The external fibre of the leaf on both sides is formed by the epidermis; on the under side of the leaf it generally consists of sinuated, tubular cells, and it contains more stomata; on the upper surface the epidermic cells are mostly larger, less sinuated, often merely polygonally tubular, stomata being quite absent, as in many leathery leaves. The epidermis often carries different appendices, as hair, glands, etc.; sometimes single cells are enlarged, and enclose a large crystal of oxalate of lime. As a rule, the epidermal cells enclose colourless, seldom coloured, cell-sap; sometimes other substances, as resins, essential oils, starch, etc. In leathery leaves they are, especially towards the outer side, thickened and covered with a stout cuticle.

Between the two fibres of epidermis lies a tissue consisting chiefly of cells filled with chlorophyll, in which are imbedded the ramifications of the fasciculi. This mesophyll is composed in most leaves of two layers: the upper one is formed by one or more strata of vertical, short, cylindrical cells, and between this and the epidermis are sometimes interposed single or manifold layers of cells filled with colourless cell-sap, rich in mucus (folia bucco); the lower layer of the mesophyll generally forms a spongy or spheroidal parenchyma.

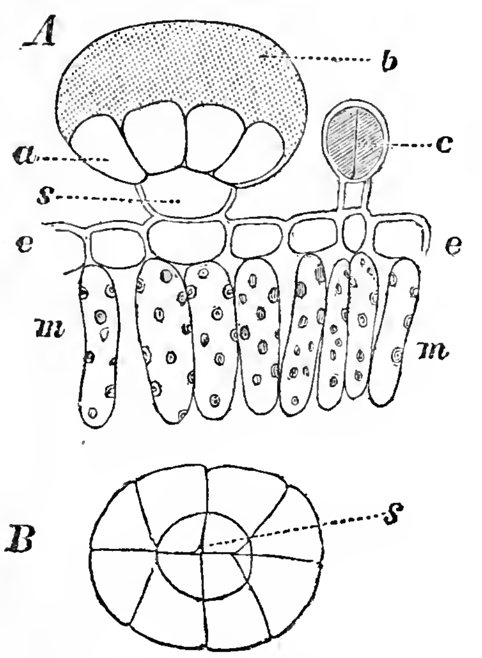
Single cells of this tissue often enclose, besides chlorophyll, crystalline deposits of oxalate of lime, either in separate crystals (*Hyoscyamus*) or in glands (*Thea*) or in powder (*Belladonna*). In many instances the mesophyll contains cavities filled with essential oils (*Ruta, Barosma*) or separate large oil-cells (*Laurus*). Such leaves appear in transmitted light as translucently dotted. Amorphous tannin is in the cells of most leaves microchemically recognizable; the coarser nerves generally project at the lower surface, whereas the transmitted light makes those delicate ramifications visible which do not stand out from the parenchyma. The direct elongations and ramifications of the fasciculi vasorum, running up from the stalk of the leaf, are called primary nerves, the branches springing from the same secondary, tertiary, quaternary nerves, in such manner that secondary nerves are all those branches from the primary nerves which are equally strong, tertiary similar branches from the secondary nerves, and so on.

Dicotyledonous leaves may be classified as having two forms of *nervation*. There is either a single primary nerve, direct continuation of the fasciculus of the stalks up to the point of the leaf, and dividing the whole surface into two lateral halves, or the stalk on entering the leaf splits up into several primary nerves diverging towards the edge, radiated nervation (*Adiantum, Malva, Tussilago, Aconitum*), or converging in circles towards the point, pointed nervation (*Arnica, Coca, Saponaria, Erythræa*). In the last two cases the central primary nerve is generally stronger, and is called the median nerve, whereas the other weaker nerves are called lateral nerves.

Sometimes the leaves are distinguished as mononervous or polynervous from the number of primary nerves.

The secondary nerves may likewise be further classified; they or their branches continue to the edge, more or less in a straight line, without intertwining (*Scolopendrium, Datura, Achillea, Conium*), or they extend in a circle towards the edge, without touching it, and combine into a fine network.

One of the several subdivisions of leaves contains the aromatic leaves of the Labiates. It includes the non-perennial leaves of labiates, remarkable for their aromatic smells, owing to essential oils; these oils of various composition are exclusively, or at least chiefly contained in excessively developed hair or glands, dispersed sometimes on both sides of the leaf, sometimes only on the under side, frequently sunk into the epidermis between the ordinary hair of the leaves. They generally occur in two distinct forms, differing not only in shape and size, but also in structure and other behaviour; we may call them large and small glands. The small glands (*c*) form a short hair of one to three cells, the end cell of which is expanded in globular or ellipsoid shape, and is either single or encloses two adjoining secondary cells; the large cells A, B, on a short stalk (*s*), contain in the perfect state in one primary cell eight secondary cells (*a*), with extremely delicate walls. These last generate the essential oil, which, exuding at a later period, collects above them, and lifts up the membrane of the primary cell in the shape of a globe (*b*); this membrane is cuticular, whereas that of the secondary cells shows the reaction of cellulose. At a later period the oil appears to leave the envelope, at least the whole gland system is often wrapped up in an oil-drop, and the surrounding hair is saturated with oil.



Part of a Section from a Leaf of Melissa officinalis.

A. Large gland; (*a*) secondary cells; (*b*) space filled with essential oil; (*s*) stalk-cell; (*c*) small gland.

B. Large gland, seen from above.

The structure of these organs is best laid bare by exhausting segments of leaves with alcohol and ether, and placing them in a drop of solution of chloride of zinc and iodide of potassium. The two forms of glands are connected by their development. In the small glands one surface-cell, by repeated division in a horizontal direction, results in the stalks containing several cells, after which the end cell expands globularly, and generally divides into two secondary cells by the formation of a vertical diaphragm. In the large glands horizontal division produces two cells, one above the other, the lower of which becomes the stalk-cell, and the upper one, by repeated vertical partition, composes the gland body. Examination of young leaves clearly shows the different stages of development.

We should wish to give many more instances of the scientific treatment of the different subjects, and our only difficulty consists in the selection of some article more valuable than the rest. We will take one on a well-known drug,—*rhubarb;* which, will bear out our assertion that the author has a singular facility in combining scientific observations with practical remarks.

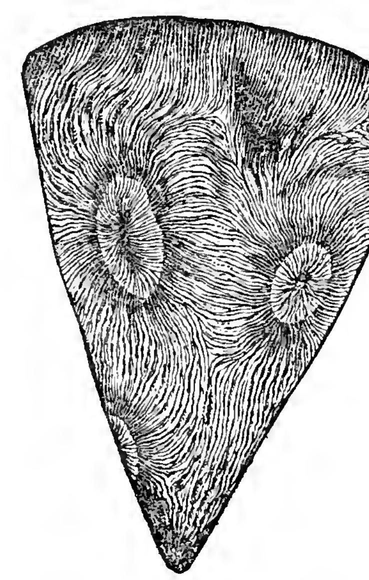
Until the latter part of the past century Russia was the only country which supplied the European market with rhubarb, and since 1728 exclusively *viâ* Kiachta, a Siberian frontier town, south-east of Lake Baikal. The trade in this drug was a monopoly of the Russian Government, in consequence of a treaty between Russia and China. All cargoes of rhubarb had to be deposited in a special warehouse, rhubarb-brake, and underwent a strict examination by experts; every piece was tested by boring into it or breaking it, and nothing but the very best quality was retained, the rest being burnt. The selected pieces were finally prepared by decortication, drying, etc., and were packed most carefully in boxes, which were enveloped in cloth, covered with pitch, and finally wrapped up in hides. Once a year, in winter, cargoes of 400 cwt. each were sent *viâ* Lake Baikal and Irkutsk to Moscow, where it was sold to the pharmacists to the Crown, or to other wholesale houses.

After Canton and Macao had been opened to the foreigners, the rhubarb trade took a southern direction, and a new sort appeared in the market, under the name of Chinese or Canton rhubarb, as distinguished from the Russian or Moscow rhubarb. The opening of other Chinese seaports influenced the Russian trade so seriously, that in 1863 the *brake* at Kiachta was closed altogether, and there is now only one kind of Asian rhubarb.

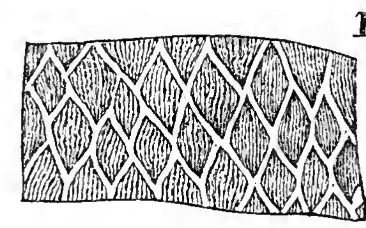
The exterior of the drug, free from powder, shows white or yellowish veins or fibrous tracings, the interstices being filled up by a white mass with fine longitudinal lines of an orange-red or yellow or brownish-red colour (Fig. B).

The section of a cylindrical piece, not too much decorticated, shows an outer bordering of a dark brown, dense, bright layer (cambium layer), about 1 mm. thick; then comes a zone (radiate layer), about 1 cm. thick, of alternately broader white and narrower yellow or red radial stripes, the last of which run out into the cambium layer.

A



B



Considerable hardness and density sets off this zone from the next, which is loose, pulpy and powdery, about half the thickness of the previous one, and recognized by yellow and red spots; a simple circle of peculiar small systems of streaks separates the last zone from the central pithy mass, which is of a similar character.

Larger pieces of the top of the root, which are well decorticated, do not show these regular sequels of distinct layers; the cambium does not show at all, the radiate layer is generally only indicated, and it is mostly followed by united veins of different size (fig. A), which run deep into the interior, or frequently also to the outside.

According to the decortication the pieces consist either entirely of the woody substance, a proper pith being absent, or they show part of the inner bark; this, corresponding to the *liber*, consists of extended amylaceous parenchyma cells and crystal fibres, and of cribriform tubes.

The white primary mass belongs to the texture of the ligneous bundles; the yellow, red, or reddish-brown stripes, rays, lines and spots are pithy rays, in two or four rows or round cells with thin membranes; the ligneous bundles consist of amylaceous parenchymatic elements with crystal cells, each of which encloses oxalate of lime.

The peculiar, and for Asiatic rhubarb characteristic, formation of the radiate layers (Wigaud's) is of great interest; every single one is a complete system, representing the construction of a dicotyledonous axis, consisting of phloëm, xylem and cambium; the last is often visible to the naked eye as a dark ring; strange to say, the parts of the phloëm, viz. the liber and the cortical rays, are inside the cambium, while the parts of the wood, viz. ligneous and pithy rays, are outside; this is a distinguishing mark from the drug cultivated in Europe.

The cells of the pithy rays and of the ligneous parenchyma carry the active and colouring principles, and the last also starch; the first show under oil a lumpy bright yellow or orange-red mass, sometimes divided into several angular or round fractures, in the adjoining cells of the ligneous parenchyma a yellow bag encloses the starch.

Solution of iron colours the yellow lumps and bags first green, afterwards deep blue; in water they break up with yellow colour into molecular grains; glycerine dissolves them with yellow colour. Alcohol produces in the cells of the pithy rays enclosed in a light yellow bag reddish-brown bubbles, which gradually dissolve to a yellow solution, especially on addition of water; solution of iron then produces a blackish-blue precipitate of a fine grainy or flocculent nature; ether dissolves part of it with yellow colour, potash with splendid blood-red colour.

The purgative constituent of rhubarb is, according to Von Schroff, chrysophanic acid ($C_{20}H_8O_6$), a yellow, crystalline substance without taste or smell, soluble in alcohol and ether with yellow colour, and producing with alkalies a solution of a splendid dark red colour.

The root contains also three resinous substances, a full investigation of which is still wanting; these are erythroretine, phaecretine and assoretine. Alkalies dissolve the first with purple colour, the second with reddish-brown colour, and the third with dark brown colour; the first is soluble in alcohol and ether, the last is insoluble in ether. Warren de la Rue and H. Mueller separated also emodine, a red crystalline resin, soluble in benzole.

All these substances form, together with tannin, the sole contents of the cells of the radiate layers and part of the contents of the adjoining ligneous parenchyma.

Starch is present in globular, mostly in regular forms, of about 0·012 to 0·016 mm. diameter.

Besides the above substances, sugar, pectine, wax, fat and traces of an essential oil have been found in the root; the ash amounts to 13·87 per cent., 7·33 per cent. of which is oxalate of lime; the remainder, carbonates of potash and lime, and alumina and magnesia.

It is doubtful whether the Rhaponticum of the ancient Greeks and Romans is our *Rheum rhaponticum*, also whether rhubarb was at all known to them.

European rhubarb is sometimes substituted, but may be easily distinguished as stated above. Last century experiments were made in different countries to cultivate rhubarb, several varieties were planted, as *R. rhaponticum*, *R. palmatum*, *R. undulatum*, *R. compactum* and others; almost every one was for a time considered to be the genuine rhubarb plant, and hopes were raised to become independent of the expensive Russian drug. But the products differ mostly in outer appearance, but more so in the absence of the pithy veins.

They are brought into the market decorticated, often rubbed with genuine rhubarb powder, and sometimes even with holes bored into the pieces. The surface is generally more yellowish-brown or reddish-white, with extended strings of vesicles instead of rhomboic meshes.

The section of European rhubarb shows the white or whitish-red primary mass, interrupted by red or reddish-brown rays, starting from the circumference towards the centre, without the least indication of a mark layer, and hence, without separation of the remaining part into a central mass and a zone surrounding the mark layer.

This regular structure is also visible on breaking a piece; even the centre of the largest pieces never show the marbled appearance, due to the irregularity of the rays and the presence of many spots; this difference is highly characteristic; the structure of European rhubarb is, as a rule, looser, soft, uniformly white or yellow, with many red or red-brown specks. Smell and taste are similar to those of genuine rhubarb, but weaker, the same active principles being present, but in much smaller quantity; starch is more predominant in the single structural elements of the European root, but the form of its grain and that of the oxalate of lime are the same as those of the Chinese rhubarb.

Most reluctantly do we close this book, which more than confirms the well-known advanced position of Dr. Vogl as an original investigator and microscopist; he is the first to show strict characteristics of vegetable drugs, drawn from the structural conditions as shown under the microscope. We have already pointed out that the book really is much more than a commentary to part of the Pharmacopœia, inasmuch as it treats with great completeness nearly as many non-officinal as officinal drugs, and it may in fact be considered one of the best books ever written on pharmacognosy.

The second or chemical part of this volume, written by Dr. Schneider, will form the subject of our next communication.

Obituary.

PROFESSOR BLYTH.

Dr. Blyth, the distinguished chemist and lecturer, has just died. Born in Jamaica, in 1814, he was, in early life, a student of the University of Glasgow, and spent, subsequently, several years in France and Germany, acquiring scientific knowledge under the most eminent foreign lecturers. In 1845, on his return home, he was associated with Dr. Hofmann in the establishment of the Royal College of Chemistry, and in 1847 was appointed Professor of Chemistry at the Royal College of Cirencester. On the death of Mr. Gregory, Professor Blyth was chosen by Baron Liebig as editor of his works in England, and finally settled in Ireland.

MEETINGS FOR THE ENSUING WEEK.

MONDAY.........*Medical Society*, at 8 P.M.
Jan. 15. *London Institution*, at 4 P.M.—"Elementary Chemistry." By Professor Odling.

TUESDAY ......*Royal Institution*, at 3 P.M.—"On the Nervous and Circulating Systems." By Dr. Rutherford.
Jan. 16.

WEDNESDAY ...*Society of Arts*, at 8 P.M.
Jan. 17. *London Institution*, at 7 P.M.—Conversazione.

THURSDAY......*Royal Society*, at 8.30 P.M.
Jan. 18. *Royal Institution*, at 3 P.M.—"The Chemistry of Alkalies and Alkali Manufacture." By Professor Odling.
Linnean Society, at 8 P.M.
Chemical Society, at 8 P.M.

FRIDAY ....*Royal Institution*, at 9 P.M.—"On the New Metal Indium." By Professor Odling.
Jan. 19.

SATURDAY......*Royal Institution*, at 3 P.M.—"The Theatre in Shakspeare's Time." By W. B. Donne.
Jan. 30.

The following journals have been received:—The 'British Medical Journal,' Jan. 6; the 'Medical Times and Gazette,' Jan. 6; the 'Lancet,' Jan. 6; the 'Medical Press and Circular,' Jan. 10; 'Nature,' Jan. 6; the 'Chemical News,' Jan. 6; 'English Mechanic,' Jan. 5; 'Gardeners' Chronicle,' Jan. 6; the 'Grocer,' Jan. 6; the 'Journal of the Society of Arts,' Dec. 30; the 'Practitioner' for January; the 'Doctor' for January; the 'Food Journal' for January.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Observations in Practical Pharmacy.

Sir,—May I be allowed space in your valuable Journal to make a few remarks on a paper read at a meeting of the Liverpool Chemists' Association, by Mr. Charles Symes, on "Observations in Practical Pharmacy," and printed in the Pharmaceutical Journal for December 30th, 1871. I shall pass by his instructions respecting the manufacture of pessaries and suppositories, and proceed to notice the formula for a six-ounce mixture, containing:—

Tinct. Guaiaci ℥ss
Pot. Bicarb. ʒij
Sp. Ether. Nit. ʒiij
Aquæ ad ℥vj. M.

It is there stated that, "Mix these ingredients in whatever order you please, the resin will deposit in lumps," etc.

I would respectfully suggest that what is impossible to one individual, may be, and often is, performed with ease by another, and the above is a case in point. There is not the slightest necessity for medical men to substitute powdered guaiacum for the tincture in the above or any other formula.

The mixture can be made in less than two minutes, without the resin coming out in lumps, and without a particle of it adhering to the bottle, by proceeding in the following manner:—1st, fit a cork to the bottle intended to hold the mixture; 2nd, weigh the potass. bicarb. and put it into the bottle; 3rd, add to it ℥v of distilled water; 4th, measure the tincture and spirit together; 5th, pour these into the bottle, taking care that it falls clearly into the water, etc. (this is important for ensuring a fine division of the resin); 6th, immediately cork and shake for a second or two; 7th, fill up with distilled water. When first made, the mixture has a dirty drab appearance, changing in two or three hours to a bright green. The precipitated resin is so finely divided, that after standing seven hours, it measured ℥iij, and at the end of three days, occupied a bulk of ℥ij. The supernatant liquid is a clear brownish-yellow colour; there is not the slightest adhesion of resin to the gla s, and the precipitated resin is at once diffused through the liquid by agitation.

The Dispensary, Grantham, G. Welborn.
January 8th, 1872.

Early Closing.

Sir,—I have noticed with much interest the varied suggestions as to early closing and an increased charge made for all articles supplied before or after the usual business hours. Now, I live in a town where there are four chemists, and for the last twenty years have, at various times, attempted (though unsuccessfully) to abridge the long hours of labour and to close when some relaxation might be practicable. The tradespeople, in the winter, close at seven; and, some time since, we all signed a paper agreeing to close at five one day in the week. Blessed relief from toil! Alas, "like Dead Sea fruits, which tempt the eye, but turn to ashes on the lip," our window-shutters are put up, but the door-shutters down, and as a country druggist does not object to a little poaching on other trades, our friends who have neglected to get in time any little article of grocery, can have most of their wants supplied by the same professional gentleman who mixes oils, colours, tea, spices, pickles, and what Mrs. Malaprop calls articles of "bigotry and virtue," with "prescriptions accurately dispensed." I have in vain suggested we were wanting in good faith to our brethren; proposed we should decline selling all non-medicinal articles; advocated an increased charge for everything supplied before or after certain hours. "Rem recte si possis, sed modo quocumque rem," is the practical reply. One stands out, with him I am on a friendly footing; but on this one point we are two, and, like wretched victims under Juggernaut, we immolate ourselves before the autocrat of prolonged and unnecessary labour. Now, Sir, that we are striving to emerge from the ranks of the ordinary trader, when we dazzle the public with the blazon of "Pharmaceutical Chemist," as prominently as paint and gold-leaf can make it; when we add to our labels the prefix of Mr., is it not a little incompatible with our "dignity," when our less aspiring neighbours are closed, to be catch-pennies, and to spend fifteen hours a day money-grubbing, when they think twelve sufficient? I have no doubt my neighbour would agree with me that, in the winter months, after eight P.M., the profit on the few coppers which are taken will barely pay for the gas. This is now an age when long hours are becoming obsolete, and may be consigned with the rack, thumb-screws and other tortures of past generations, to oblivion. I dislike combinations, but do think if the assistants themselves firmly and respectfully remonstrated with their employers, when their hours of attendance were unnecessary, a remedy mutually beneficial would soon be adopted. While we continue to keep our shops open, the public will put off their purchases, knowing they can be waited on. The late O'Connell was fond of one quotation, "Hereditary bondsmen, know ye not who would be free, themselves must strike the blow?" The word is as applicable to the assistants as it was to the people to whom it was spoken.

George Seaton.

Chelmsford, January 8th, 1872.

Sir,—Having read Mr. Stables' letter on early closing, in your last issue, I strongly approve of his opinion, that the subject should not be allowed to drop, but should now be taken up by the assistants as a body.

I had thought that the benefits of early closing had been recognized everywhere, and by all, although by some certain false difficulties have been raised as a bar to its adoption, but from the remarks made by a member of an English association at a late meeting, it would appear that in that benighted land there are still some who in their error conceive its fruits to be not good but evil. The assistants and apprentices of that district must indeed be sad specimens of humanity, if it is necessary to keep them prisoners to the pestle and mortar, in order to prevent them squandering and frittering away their time. If they cannot be trusted to employ in a right manner their own time, I would not say much for the way in which they use their masters. But degraded so far I cannot believe them to be, and altogether, I think this is one of the most unreasonable objections to early closing I ever heard of. Agitations on this subject have been got up at various times, and in divers places, and although in some places they have been crowned with success, in the majority, I am sorry to say, the evil still exists as rampant as ever.

What is the cause of these failures? Seemingly it is the want of unanimity amongst masters. It is the experience of nearly all such cases, that whilst the majority of masters are in favour of early closing, there are one or two who by raising objections, succeed in deterring the others from its adoption. But should unanimity be necessary? I consider that such objections should not prevent early closing, but that where the majority are in favour of it, it should at once be adopted, and it would be found that the others would soon follow suit, for their own sakes.

Were assistants but to unite in their demands, and press them as they should be pressed, we would ere long have early closing an accomplished reality, and not a visionary ideal. Let there be an association formed, having branches in all towns where early closing is not already in force; let there be a nominal subscription to pay expenses, and let a protest and demands be published, and a united and simultaneous effort made throughout the kingdom, and I am sure such an effort would at once be successful. To London, as the centre of all pharmaceutical progress and reform, I would look for the formation of such an association; and, not as a sufferer, but as one who feels the benefit of early closing, and would like to see all enjoying the same, I call upon the assistants there to form this association (there would be no difficulty in obtaining some influential gentlemen as active promoters), and I can assure them they may depend on the enthusiastic support in every way of their provincial brethren. Surely, if at any time early closing was a necessity, it is now, when examinations, calculated to raise the status of the trade in every way, are compulsory; examinations for which, careful study is required, study which, with the present shameful hours of labour, it is almost impossible to attempt.

If masters could only see their own interests aright, this subject would not require to be thus pressed on them. With shorter hours assistants would give a more cheerful and better rendering of their duties, and masters would find themselves in possession of a better class of assistants, mentally and physically.

I trust that these remarks may be of use, if but to draw forward more opinion on the subject, and apologize for trespassing on so much of your valuable space.

UNITAS.

Belfast, January 2nd, 1872.

Sir,—I observe in the PHARMACEUTICAL JOURNAL of last week, a few remarks by Mr. T. B. Stead, at the Leeds Chemists' Association, regarding the early closing movement, insinuating that if the short-hour movement was adopted, a squandering of time would be the result. This is an argument so shallow and narrow-minded that it ought to be resented. Surely druggists' assistants do not need to be kept down with such an iron hand.

Assistants who would squander their time if they closed at 8 P.M., squander it, and have more opportunities of so doing at present, under the despotic reign of long hours. What was Scotland prior to Forbes M'Kenzie's Act and the general eight o'clock movement in other trades? It was then that time was squandered. Even at the present time in the class of trades as druggists, where the long hours are kept up, what can a young man do at night? Energy is not left him for study and no time for healthy recreation, so he drops into a beer-shop and there spends his evening, rising in the morning with an aching head.

A word on the Sunday trade as far as Glasgow is concerned, would the young men squander their time on that day? If they did, it could not be worse squandered than at present in the retailing of hair-oil, liquors and Seidlitz powders. That such should be required from a class of men claiming a standing in society is disgraceful.

If the assistants in the several large cities would form themselves into associations, they could show the public that they will not serve it for so many hours as they have hitherto done. Such an Association has been formed in Glasgow, and met with fair success. In conclusion, I would recommend Mr. T. B. Stead to study the opening address of Mr. E. C. C. Stanford, F.C.S., given at the Glasgow Chemists and Druggists' Association, published in the Journal some short time since.

Glasgow, January 2nd, 1872. GIGNOSKO.

Sir,—Some twenty years ago I had a conscientious belief in the value of physic, and in consequence felt it to be no other than my duty to be prepared to supply a penny's worth of castor oil or an eighteenpenny mixture at all hours, night or day, Sunday included, till business became a veritable curse. Increased personal experience and more extended observation have materially altered my views, and I am now firmly convinced that if physic and physicians and all connected therewith (surgery excepted), were cast into the sea and heard of no more, the world would be a decided gainer thereby. I now, therefore, in a somewhat mechanical way, pursue my calling from 8.30 A.M. till 8 P.M. for six days of the week, and refuse to be bothered at all other times and seasons, and need scarcely add that my entire household is the happier for the change, and business, I am glad to say, none the worse. If my brother chemists would have the courage "to go and do likewise," there would be fewer cases similar to poor Elkington's, mentioned last week in so kind and feeling a manner by Mr. Wilmott.

AN OLD CHEMIST.

THE BENEVOLENT FUND.

Sir,—At p. 558 of last week's Journal I was interested to see the list of annuitants; and it would perhaps have been well if the residences had been given, to compare the proportion of London and the country.

In looking over the life annuities granted by Government, it appears to me that our Benevolent Fund might be benefited by allowing a limited number of our members, elected annually by seniority of age and of membership, to purchase a small annuity, say of £10, at the same rate as given in the British Postal Guide, thus:—

A man aged sixty can purchase an annuity of £10 for £105. 11*s*. 8*d*.; aged sixty-five for £88. 18*s*. 4*d*., and so on.

If the Council of our Society could lawfully do this, the annuitant might be made life member by way of bonus; that is to say, over and above what the Post-Office gives.

If this hint is worth entertaining, you can insert this in the Journal or submit it to the Council, as you think proper.

Chilcompton, Bath, JOSEPH LEAY.
Tuesday, January 9th, 1872.

Sir,—I have read your editorial remarks with regard to the "Benevolent Fund," and have, since doing so, added up the donations given by about 660 individuals, and I find that the total amounts to about £527; from this deduct £77 given in temporary relief, and there is a balance left available for capital account of £450. The interest on £12,000 Consols would amount to £360, and be sufficient to meet the £347. 10*s*. paid to the annuitants during the past year.

I find from the Register that we have 12,000 registered chemists, and I should like to see our Benevolent Fund established on a broad basis. Suppose each of the 12,000 chemists were to give one shilling per annum, there would be a sum of £600 each year available for the Fund. At the present time I believe there are 660 persons contributing,—only about one-twentieth part of the whole body of chemists. I have looked over the list of towns where chemists contribute, and find that York, with 36 chemists and 3 wholesale druggists, contributes nothing; Manchester, with 200 or more chemists, has only 20 contributors; Liverpool, with 200 or more, has only 10 contributors; our little city, "Ripon," with 6 chemists, "contributes nothing;" and so on all through the kingdom. Surely, Mr. Editor, it is possible to remedy this state of affairs! I have lived in Lancashire, and seen splendid churches built out of funds provided from weekly subscriptions of twopence from each member of a poor congregation.

Would it not be well to send a circular to each local secretary, and request him to collect at least a shilling from each chemist in his neighbourhood? Of course, where a chemist is local secretary in such places as Manchester, Liverpool, Birmingham, Newcastle and other large towns, I would empower him to employ a trustworthy agent to collect the subscriptions, and allow a small percentage.

I am convinced the foregoing project is feasible, and, if properly carried out, would put our Benevolent Fund on a solid basis, and provide assistance for any of our members who, by sickness or misfortune, may in future be brought to destitution.

I would also suggest that at the end of the year, when the list of subscriptions is published, the figures should be added, and the total amount shown.

If my suggestions should be of any service, and at all instrumental in augmenting the funds of our excellent institution, I shall be much pleased.

North Street, Ripon, THOMAS STEVENSON.
Jan. 10th, 1872.

John Bradshaw (Congleton).—The thick consistence is preferred by many medical men. Probably your difficulty might be overcome by making the preparation in the phial brought for it.

T. A.—We know of no better book for the purpose than the one you possess.

"*Ecosse.*"—We do not exactly understand what you mean by the deodorization of alcohol.

W. J. Dale.—The provisions of the Act were only intended to apply to substances that are of a poisonous nature. Yellow prussiate of potash is not a poison, and is, therefore, not subject to them; the red prussiate of potash is a poison, and must, for that reason, be dealt with accordingly.

O. P. Q. (Halifax).—The effect you speak of was probably due to the liberation of acid from the nitrate. See an article on the subject by Professor Redwood, PHARM. JOURN. 1st Series, Vol. VI. p. 419.

"*A Student of the Society.*"—We do not know of one.

"*A Duly Registered Assistant*" has not sent his name and address.

ERRATUM.—List of subscriptions to the Benevolent Fund, *for* "Muter, John, 289, Kennington Road," *read* Muter, Dr. John, 231, Kennington Road.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. H. Pocklington, Dr. De Vry, Mr. R. G. Mumbray, Mr. F. B. Benger, Mr. L. Hooper, Mr. T. Beesley, jun., L. S. R., C. C., "Ferrum," "Ebur," C. C.

THE PRUSSIAN MEDICINAL EDICT OF SEPTEMBER 27th, 1725, AND THE REVISED APOTHECARIES REGULATION OF OCTOBER 11th, 1801.

A new law regulating the position of the pharmacists, their assistants and apprentices, is to take effect in Germany from the 1st inst., and it may, therefore, be not out of place to look into the expired laws of Prussia, dating from 1725 and 1801 respectively, as they give a curious insight into times gone by.

The oldest law, that of 1725, opens with a sort of preface, a "whereas," in which his Majesty King Frederick William makes it known to everybody that he has learnt with especial displeasure that, notwithstanding his previous salutary edicts and mandates in "medicinalibus," there still remain in medicine, chirurgery and pharmacy manifold obnoxious irregularities and dangerous abuses; that there are people of different trades, professions and handicrafts, who, to the greatest danger of his subjects, arrogate internal and external cures, who even compound medicaments and sell the same to patients, whereby many people lose their health and welfare, and even their lives.

The law then gives the constitution of the "Collegium medicum;" the Court Marshal and Minister of War, "He von Printzen," who is appointed the chief and director, being ordered, whenever necessary, to assist the Council with his advice.

The regulations themselves begin with the "medici."

The medici shall, above all, live together in peace and harmony, fulfil their duty to the patient honestly and conscientiously, as they may have to answer for it before God and everybody, be careful in ordering medicines, inquire well into the patient's condition, not divulge any secret diseases to anybody, not ask excessive remuneration, especially of poor people, but practise herein all possible modesty, and altogether take such interest in the conservation and restoration of their neighbour's health, as may be expected from a true and honourable "medicus." The medici, in consideration of the noble creature intrusted to their care, shall also lead a respectable, honest and sober life, not envy each other's fortune, much less try by underhand means to abuse each other, and in case two or more of them are called to one patient, they shall not secretly or individually prescribe, but confer in all modesty on the patient's illness, and endeavour to cure him by reasonable "concilia" and prescriptions.

The qualifications of the medical man, who was not allowed to practise surgery, are as follows:—He must produce his *dissertatio inauguralis* and other *testimonia publica;* he must then pass his *cursus anatomicus* in six *lectionibus* during the winter months, and elaborate a *casus medico-practicus;* after which, if he is successful, he must swear the *juramentum medicorum.*

He is then allowed to practise medicine; but he is expressly prohibited from undertaking external chirurgical cases, or to dispense, so as not to interfere with the pharmacist. The last stringent rule has one amusing exception, which clearly is the beginning of the patent medicine mania. In case a medical man has discovered a certain *arcanum* or *remedium specificum*, which in certain diseases, expressly to be named, acts superior to all known *usualia medicamenta officinalia*, he is allowed, after a fair trial by other trustworthy medical men and by the medical council, to sell the same at a moderate price in pharmacies, and to prescribe it for his patients; but *one* medical man is, under no circumstances, allowed to have more than two of these *laudabilia medicamenta.*

The already existing scale of fees for medicus, chirurgeon and pharmacist remains in force, so that every one may know how much to ask and to charge for his manifold care and trouble, and that the patients may have no cause for complaint; but this scale shall not prevent people of rank or fortune from acknowledging, with more discretion or liberality, the zeal, industry and care of the medical man or chirurgeon; it is only drawn up for those of limited means.

We now come to the surgeons—the chirurgi.

The surgeon, before being admitted to practise, must produce a correct indenture of apprenticeship and other good certificates, by which he proves that he has served at least seven years as an apprentice, also his time as an army-surgeon; he then must attend a *cursus operationum* and pass an examination.

A good illustration of the passion of Frederick the Great for everything French is given by a quotation from a previous law of 1714, according to which twenty German and six French chirurgeons were allowed to practise in the royal residences.

The surgeons have to lead a sober, quiet, and modest life, pleasant to the Lord, so that they may be well qualified to serve their neighbours with their art and science, be it at daytime or at night; they shall especially endeavour to attend such patients, as may consult them, with inexhaustible zeal and care; they shall also, in times of plague and epidemics, which may the Lord avert, visit the hospitals.

The surgeons must abstain from all internal cures and preparing or dispensing of medicaments. Experience has too often shown that in *lue venerea*, or other diseases, gross mistakes have been made *cum medicamentis mercurialibus internis* or *per inunctionem mercurialem*, which the patients have to pay with their lives; therefore the chirurgeons shall not undertake such-like cures without the assistance of a medicus, as they often have done without necessity and for the sake of mere gain.

The next subject is of more special interest to the readers of this Journal, viz. the position of the "apotheker" 150 years ago.

The edict states that the country's welfare, the patients' life and health, and the honour and reputation of the medicus depend partly upon the diligence, science and fidelity of the apothecaries; they shall, therefore, be bound by all points of the edict. Before being allowed to open a business, they shall produce their indenture of apprenticeship, and other papers to prove that they have served at least seven years as assistants, or journeymen as they were then called; they must *publico* elaborate the *processus pharmaceutico-chymicus*, and pass an oral examination.

The number of pharmacies at Berlin was considered too high, and it was ordered to gradually reduce the same to twelve, namely nine German and three French, and not more.

As to the duties of the apothecaries, they must above all lead a pious, sober and modest life; act honestly, peaceably and kindly towards everybody, and not be envious of each other; in their vocation they shall always be trustworthy and diligent, collect all *simplicia*, of good quality, unadulterated and at the right season, keep the same well and in proper vessels. For the "*composita*" they shall take good, select pieces, prepare all *medicamenta et chymica* according to the *dispensatorium*, and keep the same well; they shall charge all medicaments ordered by prescription according to the tariff, not more nor less, under a fine of twenty-five thalers for every single contravention, nor shall they ever take one ingredient instead of another.

Venena, or poisonous or dangerous drugs, shall be kept under lock, and not too near to other medicines; special balances, mortars, sieves, etc., shall be kept for them; and no poison shall be sold to unknown or suspicious persons without a certificate from a medical man. No internal medicines are to be dispensed unless prescribed by authorized physicians, with the exception of those prescribed by experienced foreign physicians which do not contain anything suspicious or doubtful.

So-called *arcana*, unless approved of by the Medical Council, must not be sold, under a fine of one hundred thalers the first time and loss of the licence the second time.

Apothecaries shall not prescribe, but they are allowed to sell simple articles as manna, senna, rhubarb, etc., but not *vomitoria*, *purgantia*, *menses moventia*, *ex antimonio et mercurio præparata* or *opiata*, such as *philoninum romanum*, *requies Nicolai*, nor *bezoardica* or *sudorifera*.

The pharmacies are to be inspected by a commission at least once every three years, and the costs thereof have to be shared by the town councils and the pharmacists.

Then follow a number of regulations to protect the pharmacist, one of which is headed "Booksellers shall not deal in medicines." A variety of people whom the medicinal institutions do not the least concern,—such as printers, booksellers, sugar-bakers, merchants, grocers,—have dared to sell medicines; and a number of male and female persons, who have no connection whatever with medicine or pharmacy, prepare all kind of medicines and distribute them under the pretence of benevolence. Now all these gross irregularities are put a stop to from today under a fine of one hundred thalers.

Next in order come the cuppers, midwives, itinerant mountebanks and dentists, medical students, hangmen, sieve-makers and dealers in Thuringian waters,—all of whom are, under heavy fines, prohibited from dealing in medicines.

So far the old edict of 1725. The revised regulations of 1801 open with the remark that, with the unceasing care which his Majesty bestows upon all branches of the administration, it has not escaped his notice how much the welfare of his loyal subjects depends upon a proper arrangement of the pharmacies, and a safe exercise of the art of pharmacy. The progress in pharmacy and chemistry necessitates divers alterations, which are expressed in the new regulations.

Several articles have lately appeared in this Journal, which gave a vivid and true picture of the German pharmacists, and the laws to which they are subjected; it will, therefore, not be very interesting to repeat many of these descriptions by copious extracts from the laws of 1801, which substantially remained in force to the end of last year.

It is instructive to notice that seventy years ago the Prussian Government was already fully aware of the necessity of training good pharmacists by stringent regulations in regard to apprentices.

Experience has shown, it is stated, that pharmacists too often are careless in the selection of apprentices; that they are guided only by self-interest, and neglect their obligation to properly educate the youth. With a view to remedy this evil, it is required that the apprentice shall have a tolerably good scientific education; he must know sufficient Latin to translate easy parts from a Latin author, and must have a good and clear handwriting. The masters are not to treat the apprentices as mere labourers, but must give them instruction in practical and theoretical pharmacy, provide them with good books and afford them leisure for study, so as to educate them, not only to be skilled pharmacists, but useful citizens.

The number of apprentices is limited, and must not exceed the number of assistants kept in a business.

At the expiration of his time the apprentice must pass an examination before the "physicus," and, in case he is not sufficiently experienced, he may be put back; but if it should be found that the cause of his ignorance is not so much his own fault as that of the master, he is to finish in another business, and the master will lose his right to keep apprentices. The term of apprenticeship is limited to four years.

The duties of the assistant are also expressly defined. In dispensing he has to be careful and exact; before making up a prescription he has to read it attentively, and again afterwards and before giving up the medicine. It is expected that every assistant knows his obligations; that he therefore attend to all business entrusted to him with zeal and diligence, without neglecting his scientific studies, lead a good moral life, act towards everybody with politeness and modesty, abstain from all extravagant society, not receive unnecessary or disreputable visits, and show a good example to the apprentices in the fulfilment of their duties.

VESICATING INSECTS.

BY M. C. COOKE, M.A.

(*Continued from page 563.*)

WHITISH BLISTER-FLY, *Lytta albida*, Say; black covered with dense whitish hair.—Journ. Acad. Nat. Sc. iii. p. 305. *L. albida*, Say's 'Entomology,' i. p. 6. t. iii. *n. r.* f. 2. *L. luteicornis*, Lec. Proc. Acad. Nat. Sc. Phil. vii. 84.

Body black, entirely covered by dense, short, prostrate greenish or yellowish-white hairs. Head with a longitudinal impressed line. Antennæ subglabrous. First and second joints rufous, the latter nearly equal in length to the third joint. Clypeus, labrum and palpi pale rufous. Tarsi black.

This is also characterized by Say as a remarkably fine species, which, he says, "I discovered within about 100 miles of the Rocky Mountains during the progress of Major Long's expedition over that vast desert. It appeared to be feeding upon the scanty grass, in a situation from which the eye could not rest upon a tree, or even a humble shrub, throughout the entire range of its vision, to interrupt the uniformity of a far outspreading, gently undulated surface, that, like the ocean, presented an equal horizon in every direction.

Three species of *Lytta* have been employed and recommended in Mexico, of which we have been unable to obtain figures or descriptions. These are,—

The Four-nerved Blister-fly, *Lytta quadrinervata*, described by Herrera y Mendoza in the Gaceta Medic. d. Mexico, vol. ii. no. 17, for 1866, page 264.

The Eight-spot Blister-fly, *Lytta octomaculata*, described by Barranco in the Gaceta Medic. d. Mexico, vol. ii. no. 15, for 1856, page 225; and

The Banded Blister-fly, *Lytta fasciolata*, described by Jiminez in the Gaceta Medic. d. Mexico, vol. ii. no. 16, for 1866, page 253. All efforts to discover a copy of this Gazette in London have failed, therefore we are compelled to accept the above scanty information at second-hand.

South American Cantharides.

Several species of *Lytta* are known to be employed in South America, and of these the three species used at Montevideo by M. Courbon deserve to be first noticed, since there can be no doubt of their proved value as vesicants.

Dotted Blister-fly, *Lytta adspersa*, Klug; cinereous, minutely punctate with black; feet tawny. —Klug, Nova Acta Leop. Nat. Cur. xii. p. 434. t. 25; Linn. Trans. xix. (1843) p. 472. *Epicauta adspersa*, Dej. Cat. *Lytta conspersa*, Germ.

Native of Brazil and Uruguay.

Length 5 lines. Allied to *L. atomaria* and *L. punctata*. Black, with cinereous pubescence and numerous denuded little points. Labrum and antennæ black. Thorax longitudinally sulcate. Feet tawny.

M. A. Courbon furnishes an excellent account of this insect.* It is, he writes, from 13 to 16 millimetres in length at the most. Elytra, thorax, head and abdomen are ashy-grey, uniformly dotted with small black dots. Antennæ black. Feet yellowish, or rather reddish. The grey colour which completely covers it, with the exception of the antennæ and feet, is caused by small pulverulent scales. These may be removed by rather hard friction, and then the insect becomes black.

This species is very common in the vicinity of the town of Montevideo. It lives on the *Beta vulgaris*, var. *cicla*, DC., a plant which is also very common in the places of which we are writing. I have never met with it on other plants. It is found in the months of December, January, February and March, but it is especially in the months of January and February that it swarms about the common beet; and sometimes it is so abundant that the plant which nourishes it completely disappears under the immense quantity of Coleoptera. It is very easy to collect them. It should be done by preference towards evening, for at this time of the day these insects are less agile, and they settle on the plants. They could also be collected in the morning, but the months of January and February should always be chosen if it is wished to have an abundant supply of them. The following is a good method of collecting them:—Take a bag of convenient size, at the bottom of which place a few leaves of beet; then, on reaching the place where they are to be collected, cut the stalks of the plants which are covered with the insects near the roots, and shake them into the bags, so as to cause the insects to fall off. In this way large quantities are always collected in a very short time. On reaching home, the insects must be transferred to a large jar with a wide mouth, which is filled as full as possible. It is then hermetically closed, and exposed to the heat of the sun. The insects soon perish asphyxiated, and that the more speedily in proportion as the jar has been better filled. In this manner I have always collected and killed them. They might, perhaps, be killed in a simpler manner by leaving them in the bag in which they were collected, and exposing the bag, when perfectly closed, to the vapour of boiling vinegar.

This blister-fly requires less time than the officinal species for producing vesication, but its most remarkable feature is, that it causes no irritation of the genito-urinary organs. I discovered this valuable quality in the following manner during the years 1853, 1854, and 1855:—I had to treat, on board the brig 'Le Chasseur,' a man suffering from chronic inflammation of the liver, which passed into the acute state at longer or shorter intervals. Then there was fever which sometimes returned in the evening, swelling, and dreadful pain, which caused the patient to cry out, and compelled him to remain bent double. This pain always yielded, as if by enchantment, to the application of one or two large blisters *loco dolenti*, so that at last the patient himself asked for the application of the remedy as soon as he felt the return of his sufferings. I generally employed for this patient a blister made from the dotted fly, and on each occasion the action took place without any irritation in the region of the genital organs. But twice, when in default of this kind I employed the officinal cantharides, the patient suffered from their action on the urinary organs. As soon as I had ascertained this interesting property in the dotted blister-fly of Montevideo, I used them whenever I ordered a blister. Thus I used them six times in the case of rebellious sciatica, either on one side only, or on both sides, which only yielded to the use of blisters placed at the level of the place where the sciatic nerve issues from the basin, four times in the case of pleurisy, three times in the case of chronic bronchitis, twice at the end of pneumonia, and in all these cases I never saw any irritation of the bladder, or of the canal of the urethra.

Upon this evidence, therefore, M. Courbon most strongly recommends the employment of the *Lytta adspersa*, which he strengthens also by the testimony of M. Bonpland. Dr. Hermann Burmeister also names this species with commendation in the *Revista Farmaceutica*. "It is this species," he says, "which is known here (Buenos Ayres) as the 'Bicho moro,' and is so abundant in our gardens, where it does great damage by eating seedling plants. I have found it also in the Banda Oriental, and in the province of Mendoza."

Sunken Dotted Blister-fly, *Lytta cavernosa*, Reiche; yellowish; head and thorax yellow, punctate; thorax with three longitudinal black lines; elytra deep yellow, with large shining sunken black dots; body pubescent; feet reddish.—*Epicauta cavernosa*, Reiche, Comptes Rendus, 1855, p. 1006.

This is nearly of the same size as *Lytta adspersa*.

* Comptes Rendus de l'Acad. des Sciences, xli. (1855), p. 1003.

Head and thorax yellow, the latter with three small longitudinal black lines, more or less well marked, the head with very small black dots. Elytra of a more or less deep yellow, covered with shining, irregular large sunken black dots, very different from the small and superficial dots of *L. adspersa*. The under side of the body is covered with yellow hairs. Feet reddish.

This species is rare. "I have always found it," says M. Courbon, "on *Eryngium paniculatum*, DC., an umbelliferous plant which is very common in the Cerro of Montevideo. I have sought for it in vain on other plants. I experimented with this fly, for the first time, on the 12th September, 1852. It is very nearly as vesicant as the officinal cantharides."

(*To be continued.*)

THE ACTION OF CARBOLIC ACID AND THE DISINFECTION OF AIR.

Dr. A. Ernest Sansom has addressed to the *Lancet* of January 13th a communication in answer to the paper on "Chromic Acid as a Disinfectant, etc., more especially as compared with Carbolic Acid," by Dr. John Dougall, which we recently reprinted from that Journal.* He says that Dr. Dougall's statement that carbolic acid seems to act as an antiseptic solely by coagulating albumen is exactly opposed to the conclusion come to by himself. He claims to have shown that the white-cloud appearance in albuminous solutions to which carbolic acid has been added, is often really no albuminous precipitate at all, but is caused by refractile globules of carbolic acid in a state of fine subdivision; also, that it has been shown that albuminous solutions are antisepted when carbolic acid exists in them in too feeble a proportion to cause any precipitate whatever. He criticizes Dr. Dougall's assertion "that, in general, chemical precipitates of albumen are soluble in water, specially carbolico-albuminoid precipitates," and points out that to say such precipitates from aqueous solution are soluble in water, is to say that they are not precipitates at all. Arguing that if carbolic acid acted as an antiseptic by producing coagulation of albumen, agents which had a greater coagulating power would *à fortiori* be more powerful antiseptics, which has been abundantly proved not to be the case. He maintains, therefore, that the antiseptic properties of carbolic acid do not result solely from its power of coagulating albumen.

With regard to the assertion that the amount of carbolic acid vapour which could be tolerated in the air of a hospital ward would be entirely inadequate to act as a disinfectant, Dr. Sansom says that his experiments have shown to him that *carbolized atmospheres* are efficient in preventing putrefaction and the growth of mouldiness, more so than atmospheres impregnated with chloride of lime or sulphurous acid. He objects to the experiments recorded by Dr. Dougall, since in the one case tar oil, a crude product, weak in carbolic acid, and possessing little or no other volatile disinfectant constituent, and Macdougall's powder containing its carbolic acid in the form of carbolate of lime, and that only in one-third of its bulk, are used; in the other, the phials were suspended in a gallon bottle, the mouth of which, necessarily large, was left open. Dr. Sansom concludes by saying, "Carbolic acid is readily taken up by the air, so that 159·44 cubic inches of air at 60° F. contain one grain of the antiseptic. Air thus carbolized (currents excluded) entirely annuls putrefaction and fungoid manifestation on the surface of putrescible fluids. Such carbolized air is more permanently efficacious than air charged with the fumes of chloride of lime or sulphurous acid, and equally so with air containing iodine, creasote or phosphorus. Such carbolized air can be breathed by mammifers with perfect impunity. There is a reasonable amount of evidence derived from practical experience that the air of places can be preserved from noxious inhalations, and, at least in some degree, from the power of transmitting infectious disease when it is commingled with a volatile antiseptic."

* *Ante*, pp. 544, 568.

TANACETIC ACID AS A SUBSTITUTE FOR SANTONIN.*

BY FROSINI MERLETTA.

Tanacetic acid is prepared in distilling the heads of the common tansy (*Tanacetum vulgare*); the filtered residue is evaporated to the consistency of honey. Treated with lime and animal charcoal and dried, it is diluted first by water, acidulated with hydrochloric acid and afterwards by acetic acid. The tanacetic acid is deposited in coloured crystals, which are purified by repeated washings in distilled water. It has a sharp, bitter taste. It is insoluble in water, but soluble in alcohol and ether. Nearly all its salts are crystallizable.

The author states that as a vermifuge it operates in the same doses as santonin.

SACCHARATED COD-LIVER OIL.

M. Tissier, in the November part of the *Journal de Pharmacie et de Chimie*, publishes a method for preparing a granulated saccharate of cod-liver oil, for which he claims several advantages, and which may be flavoured by orange, vanilla, etc. The ingredients are as follows:—

White Gelatine	4 grams
Distilled Water	25 ,,
Simple Syrup	25 ,,
Finely Powdered Sugar	50 ,,
Pure Cod-liver Oil	50 ,,

The gelatine should be cut and placed in a wide-mouthed bottle; the water and syrup added, and the whole heated in a water-bath until dissolved. The cod-liver oil and the sugar should next be well rubbed up together in a mortar and then the warm solution of gelatine stirred in, the stirring being continued until the mixture is quite cold.

After some time the mass will present the appearance of a dense homogeneous jelly; it is then necessary to add a sufficient quantity of finely-powdered sugar to form a firm paste, weighing 250 grams. The paste is spread upon a marble slab, divided into small pieces and left for some hours to harden. It is then divided into small pieces the size of a lentil, which, after further drying, become sufficiently firm to allow of granulation in a mortar. The drying of this granulated powder is accomplished on a stove at a temperature of 30° to 35° C. The product will contain one-fifth of its weight of cod-liver oil. It should be kept in well-closed bottles.

THE NEW AMERICAN PHARMACOPŒIA.

The Philadelphia correspondent of the *Medical Times and Gazette* makes the following remarks upon the revision of the American Pharmacopœia and the construction of Pharmacopœias in general, which will not be without interest to those who desire to see some progress made towards the assimilation of those of different countries to one standard:—

"The Committee of prominent Physicians and Pharmaceutists appointed in May, 1870, by the National Convention for the Revision of the Pharmacopœia are

* *Journal de Pharmacie et de Chimie,* 4th ser. vol. xiv. p. 368.

actively engaged in the prosecution of their duties, and expect to publish the results of their labours next spring. Of course, in these decennial intervals, many new remedies and novel modes of preparation must suggest themselves; but it is to be hoped that more than even the usual amount of skill and common sense may be called into requisition by these gentlemen, so that we may be able to offer to the world at large a valuable contribution to literature. It is desirable that there should always be every practicable uniformity in the Pharmacopœias of Great Britain and the United States; but each country seems to be jealous of the innovations of the other. I may not be wholly correct in my assumptions, but I am disposed to think that some of the framers of these official guides have a greater satisfaction in striking out into paths of originality than in blindly following the changes suggested by even the best informed pharmaceutists and chemists of other lands. One thing must be borne in mind, however, and that is the absolute necessity in a country like our own of adapting a Pharmacopœia, within justifiable limits, to the habits, requirements, and local peculiarities of climate and population of those who are to use it. The great danger is that the Materia Medica list, which forms an important portion of it, may be expanded, rather than contracted, under the views entertained by the majority of those present at the Convention. It seems unfortunate that such should be the case at a time when the medical profession is already suffering from an *embarras de richesses*, and would gladly part with several score of useless drugs which help to swell out the long list of remedies. If the Pharmacopœia could once be reduced, however, within the limits desirable for mere practical routine purposes, it would constitute a volume mainly remarkable for its insignificance: and it is therefore, perhaps, just as well that it should contain all the remedial agents which may at the present time or in the future be found convenient or useful for the practitioner. These remarks apply quite as forcibly to the Pharmacopœias of other nations as to our own. May your own professional men, who speak one common language with those of this country, never be placed in the same straits as those of Switzerland, who, in addition to the erudite Latin, are obliged to issue their Pharmacopœia in three other languages—French, German, and Italian—to adapt it to the understanding of the variety of nationalities represented within its borders."

MEDICINE AND PHARMACY IN VALPARAISO.

A decree has been issued by the Intendant of Valparaiso, regulating the practice of medicine and pharmacy in the department, which appears to have excited a considerable amount of consternation amongst those most concerned. It certainly does prescribe an amount of government "regulation" that would, to say the least, prove inconvenient at times to the persons "regulated." After premising that the approaching rise of the Congress would leave it no time to promulgate a law which shall define the extent of the "obligations which the medical profession owes to the public," the decree orders that all "physicians, surgeons, phlebotomists, chemists, druggists, and midwives" who desire to practise their profession in the department shall give notice of their intention in writing, producing their diplomas at the same time. Notice is to be given of an intention to suspend practice, or to be absent from the department. Twice a year all those engaged in practice [query, physicians, surgeons, phlebotomists, chemists, druggists, and midwives,] are to hold one or more meetings in which questions of public health are to be discussed, and in addition the medical men are to hold extraordinary meetings whenever so required by the authorities, in times of plague and epidemic, or other grave necessity. It is made compulsory for all doctors to submit to a weekly "turn," when two are to hold themselves in readiness to serve the public from twelve at night till seven in the morning, and this without remuneration, in case of the applicants being unable personally to pay them. With only sixteen doctors the "turn" would occur once in every two months. They are also in turn to attend daily at the dispensaries, or other public places, pointed out by authority, in order to lend professional assistance to the poor, and give them the prescription they may require. With regard to apothecaries, Art. 10 says:—

"The doctors shall also be obliged, taking it by turns amongst them, to attend daily at the dispensaries, or other public places pointed out by the authority, in order to lend their professional services to the poor, and give them the prescriptions which their cases may require.

"Art. 11. Any apothecaries' shops which shall be established in future, must be situated at least 300 metres distant from any other already established. The same rule applies to those already existing, in case of their removal.

"Art. 12. There shall be apothecaries' shops in 'turn,' to supply any medicines required by the sick during the night. These shops, their situation, and numbers shall be determined by the authority, as may best befit the public requirements. They shall keep their door open and have a light inside, and have a competent person to make up the recipes demanded. They shall also have bells in a convenient place at the entrance, in order to render it easier to call up the *employés*.

"Art. 13. Each apothecary's shop shall be kept by a qualified apothecary, and the same individual cannot preside over more than one, nor be absent from it without previously advising the authority, and nominating some competent person to take his place."

ANALYSES OF IODIDE OF POTASSIUM.

The following results of a series of analyses of samples of iodide of potassium, obtained from various sources, is published in the *Practitioner* for January. All the samples contained traces only of chloride of sodium; two of them (IV and V) small traces of iodate, and one only (V) a small amount of carbonate. No other impurity was found in any of the samples. This coincides with the report of a former examination of this drug, which we extracted from the *British Medical Journal* some months ago.* It is satisfactory to find that notwithstanding the enormous increase in its price, the samples analysed were of great purity:—

No. I. White, very large opaque crystals, dry.

No. II. White, large opaque crystals, slightly moist.

No. III. White, large opaque crystals, slightly moist.

No. IV. White, very large opaque crystals, dry. Contains a minute trace of iodate.

No. V. White, small opaque crystals, slightly moist. Contains 1·24 per cent. of carbonate of potassium.

No. VI. White, large opaque crystals, dry. Contains traces of iodate.

No.	Moisture.	Iodine.	Chlorine.	Iodate.
I.	1·16	74·15	0·40	None
II.	1·69	73·75	0·35	None
III.	1·90	74·10	0·25	None
IV.	0·66	76·88	0·25	Minute trace
V.	2·20	72·76	0·12	None
VI.	0·83	74·15	0·80	Trace

Pure dry potassium iodide contains 76·50 per cent. of iodine.

* See PHARM. JOURN. 2nd Series, Vol. I. p. 89.

THE CHEMISTS' BALL.

We have the pleasure to record, that on Wednesday evening another of these successful social gatherings took place at Willis's Rooms, at which about three hundred persons were present, amongst whom were many of the best known men in the pharmaceutical world. It is almost unnecessary to say that the evening was a most agreeable one, and that everything went off well,—the capital arrangements made by the stewards having been carried out perfectly.

After the supper the Chairman, Mr. A. F. Haselden, said,—

Ladies and Gentlemen,—I rise to propose, in accordance with the usual custom, the toast, the one toast of the evening; and if by permission I diverge a little, I am desirous that it should be clearly understood that there is but one toast. I shall not detain you long by many words, for whilst the last strains of the music are sounding in your ears, and you are anxious to renew your terpsichorean enjoyment, it would be cruel on my part to do so; and, moreover, I am noted for brevity rather than otherwise; but I cannot pass directly to the toast without a word or two by way of preface. This is, I believe, the first time that a President of the Pharmaceutical Society has had the honour of occupying this chair, so ably filled upon former occasions by Professor Attfield, and upon the last so gracefully by Sir Thomas Dakin, then Lord Mayor of London (much applause); and if by so doing I should, in however small a degree, be the means of uniting in one bond of union the whole community of chemists and druggists, I feel that I shall have done something to be remembered in after years with pleasure, in connection with the Chemists' Ball. (Renewed applause.) Of all the amusements of this season of the year, there is none more enjoyable, more innocent and more healthful than a reunion like the present, and permit me to say, that all honour is due to those gentlemen who first proposed and successfully established the Chemists' Ball (cheers); also to the Stewards generally, the Acting Committee especially, the indefatigable Secretary and the courteous and affable Treasurer (much applause). The addition I wish to make to the toast is, the health of the ladies, for what should we do without them? In our ordinary enjoyments, in our daily household arrangements, what should we do without them? and, upon a festive occasion like this, how *could* we do without them—

"When we trip it as we go
On the light fantastic toe"?

(Applause.) Now for the toast; I need not ask you to support it enthusiastically, because I know you will, but let your glasses be full and let them be drained to the last drop. "Success to the Chemists' Ball, coupled therewith the health of the ladies, and God bless them—Hip, hip, hurrah!" etc. (The toast was received with loud and continued applause.)

THE METRIC AND DECIMAL SYSTEMS.

On Wednesday afternoon, January 17, a public meeting was held at the Mansion House for the promotion of the metric system of weights and measures and the decimal division generally. In the unavoidable absence of the Lord Mayor, the chair was occupied by Mr. Sheriff Bennett.

Mr. Samuel Brown moved the first resolution, to the effect that in the opinion of the meeting the introduction into the United Kingdom of the metric decimal system of weights and measures, which was already in use in many countries, would greatly facilitate commercial intercourse, and introduce economy of time and labour into practical business. There was no country in the world, he said, to which a uniformity of weights and measures would be of greater consequence than to this, tending as it would to facilitate the operations of trade and commerce, and that uniformity depended a great deal on their decimal character. The Central Board of Agriculture had given its adhesion to the metric system.

Sir John Lubbock, M.P., in seconding the motion, said he was strongly in favour of one system of weights and measures, not only in this country, but for the whole civilized world, feeling that the future prosperity of this country, to a very considerable extent, depended upon it, having regard to the great competition in business. He thought it was even more necessary to have a uniform system of weights and measures than a uniform coinage. With a common system of weights and measures, there would be no temptation to a Government or a people to degrade or alter it. He did not undervalue the advantage of a common system of coinage, but he thought there were greater facilities and advantages in the one case than in the other. Many said the system was entirely *doctrinaire*. He thought that was a great mistake, and that, on the contrary, it was one of the most important questions of the day. We had, he said, a great many systems of weights and measures in this country, and, if we only considered our internal trade, it was disgraceful to us as a nation that we should continue the complicated system which had come down to us from our ancestors. If we could not induce other countries to adopt our system, it was better for us to adopt theirs rather than be shut out from trading with them owing to the complication of our system. Again, there was no doubt its adoption would effect a great deal of saving in our school system, especially in the very point in which saving was more particularly desirable. Education was made distasteful to children by loading their memories with statistics and facts of no value to them at their time of life. Under all the attendant circumstances, although he was not prepared to express an opinion that the metric system was best, he felt strongly that any one system was better than a variety of systems, and that one bad system was preferable to half-a-dozen good ones. He believed the introduction of some one system would be of immense importance to this country, and he saw no reasonable prospect of adopting any other system but that which was promoted by the association which had convened the meeting.

General Strachey gave a circumstantial account as to what had been done in India towards a common system of weights and measures.

The resolution was carried.

It was moved by Mr. Frederick Hendriks, and seconded by Mr. Crossley, that the metric system is of peculiar value in the mechanical arts, manufactures and industry, from its perfect decimal division, and from the direct relation which it offers between the measures of length, capacity and weight.

The Rev. William Jowitt, Head Master of the Middle Class School, Finsbury, supported the motion; and, after discussion, it was put and carried.

Dr. Farr, President of the Statistical Society, moved a third resolution, to the effect that the system of decimal coinage would be a necessary corollary to the introduction of the new system of weights and measures, and the meeting urged the same on the earnest attention of her Majesty's Government.

The motion was seconded by Mr. S. Gover, a member of the Common Council, and carried unanimously.

The discussion was continued by the Hon. B. G. Northrop, Superintendent of Public Instruction in the United States; the Hon. Mr. Ryan, a member of the Canadian Senate; Mr. Chisholm, the Warden of the Standards; and the Rev. Mr. Hodgson.

On the motion of Mr. Leone Levi, seconded by Mr. William Botley, a resolution was unanimously adopted, authorizing a petition to the President of the Board of Trade, that he would in the forthcoming session of Parliament introduce a measure for amending the general law in relation to weights and measures, and for the compulsory adoption of the metric system.

The Pharmaceutical Journal.

SATURDAY, JANUARY 20, 1872.

Communications for this Journal, and books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

EARLY CLOSING.

To many of our readers the subject of early closing, frequently as it has been broached in these columns, would appear always to retain its freshness and interest. Every time the discussion is started, it produces such a mass of letters in reference to it that one wonders how it is so large a number of persons, so unanimous as to what is required, and many of them capable of writing so—well, we will say strongly—upon the subject, have not long since succeeded in obtaining their object. On no occasion has this been more true than the present. Since the publication of Mr. STABLES' letter a great many correspondents have favoured us with their opinions. We, however, think it unadvisable to print them all, not from any want of sympathy with the movement, but because the arguments contained in them having already been urged over and over again, little is to be gained by their further repetition; more, perhaps, may be done towards the settlement of the question by a glance at some of the difficulties which beset it.

One principal difficulty exists in the apparent inability of some of our correspondents to examine the question from any other point of view than their own. The man who forms his own opinion without being influenced by those of others, has been well compared to one who, in a hilly country, sees as far as the top of the next range, and fancies it to be infinity. This has led to a severity of expression towards a speaker at the late meeting of the Leeds Association, which known facts, perhaps, do not altogether justify. It should be remembered, therefore, that as this is a question in which all are interested, even what is said by the minority should be heard with respect and consideration.

Another difficulty in the way is the lamentable want of the power of self-help. Several of our correspondents consider that the initiative lies with the Council of the Pharmaceutical Society. But we think this may fairly be disputed. On this point we cannot do better than quote the opinion of Lord DERBY on an analogous subject, as expressed in a recent speech He said—

"I am expressing to you one of the deepest and strongest convictions of my mind when I say that for those social improvements which we all desire, and which are in everybody's mouth, we must look to the community acting for itself in the first instance, and to Governments and legislators only in rare and exceptional cases. . . . Take again your trade unions, by which working men have obtained, in so many branches of business, their demand for higher wages and shorter hours of work. They did not ask help from Parliament to found those unions, or to carry them on. They acted more sensibly; they did the work themselves."

The varying circumstances under which pharmacy is carried on in different localities add to the difficulty of the problem. The rule which might be adopted in one town or district might, and often would be utterly inapplicable to another. This fact appears to point out local effort as that most likely to ensure success. Some time since we referred to a resolution published to their customers by some pharmaceutists at Bow; and we are glad to be enabled also to state that the Chemists and Druggists of Hull, having been memorialized by their assistants and apprentices for shorter hours of business, in order to afford more time for study, agreed to close their places of business on and after January 1, 1872, at eight o'clock every evening, except Saturday. Advertisements were inserted in the local papers asking the public support in carrying out the arrangement. In connection with this point a correspondent suggests that great assistance might be obtained from the local newspapers if steps were taken to secure their interest in the question.

But it must not be forgotten that the plea which justified the Legislature in exempting the pharmaceutical chemist from service on juries also entails upon those who aspire to follow that calling special duties and relations towards the public. Some of our correspondents, who apparently have hardly yet got into harness, write in rather a juvenile style about "chains," and "slaves," and "freedom," and compare their hours with those of the mechanic. The comparison, however, does not hold good. In any arrangements that may be come to, provision will have to be made for the performance of those duties which the public have a right to expect, namely, the supply of necessary medicines at any hour. We should hardly like pharmaceutists to be the subjects of such a decree as that printed at p. 585: but we think the employer may fairly claim to be assisted in following out the practice on the Continent of having one person always on duty. In establishments where late hours are unavoidable, perhaps the difficulty might be met by another custom adopted on the Continent of taking recreation in the afternoon, or some other more convenient part of the day.

We think, therefore, that by courteous and careful consideration of all objections, a greater reliance on individual and local effort,—and perhaps a little less fear of the consequences on the part of the employers,—together with a real desire to meet the varying difficulties as they arise, much may be done to remedy the evils complained of.

It has often been urged that the liability of druggists to the infliction of damages through the improper sale or dispensing of poisons is a great incentive to carefulness on their part. But we venture to say that even those who most constantly have this fear before their eyes have hardly realized the extent to which the principle may be developed. This has been left to the proverbial ingenuity of our American cousins. The *New York Times*, a short time since, contained a report of a case which may be usefully mentioned here as a sort of *cave canem!* An apothecary in one of the interior counties of New York has been sued for damages by the husband of a woman to whom he had been in the habit of selling laudanum, and the Supreme Court has decided that the action can be maintained. The plaintiff avers that the apothecary supplied his wife with the narcotic, day by day, for six months, knowing the use she made of it, and that he has been put to great expense in repairing the injury that it caused to her bodily and mental health! Medical men who create an appetite for alcohol in their patients had better beware!

The thorough organization of the forest department in India has led to the preservation and extension of many useful trees, but we are sorry to find that more attention is not paid by the authorities to other useful plants. Thus we learn that, in some parts of the Madras Presidency, where the cardamom grows spontaneously in many hill tracts, and where, with good management and cultivation, it might be made to yield a handsome return, it is turned to little or no account. In South Canara some cardamom tracts have been sold on a lease of several years for a very small sum; and in portions of the Anamallays, Madura, Tinnivelly, etc., the Government tracts are poached on by collectors under the Cochin and Travancore Governments. In a great portion of these forests, however, the cardamoms are left uncared for, so that they simply rot upon the plants.

The *British Medical Journal* states that Professor Halford has received the thanks of the Indian Government for his paper on the Treatment of Snakebite by Injection of Liquor Ammoniæ into the veins. and that his pamphlet on the subject is to be reprinted for general distribution to medical officers in different parts of India.

An American correspondent of the *Medical Times and Gazette*, speaking of the decline in the reputation of condurango as a therapeutic agent, says that it is selling now at only two per cent. of its original cost, and the early purchasers are naturally sensitive at this change in its pecuniary valuation. One of them has recently found that he has not even bought the original article. We observe that condurango is now commencing to be prominently advertised in this country.

Transactions of the Pharmaceutical Society.

EXAMINATIONS.

January 1st, 1872.

PRELIMINARY.

ENGLAND AND WALES.

Two hundred and twenty-nine Candidates presented themselves for this examination in England and Wales. The following one hundred and thirty-three passed, and were duly registered as

APPRENTICES OR STUDENTS.

	Robinson, Richard Atkinson	London.
	Cobb, Joseph S.	Doncaster.
	Gibbs, Joseph	Tunbridge Wells.
	Baikie, Peter	Belfast.
	Balls, James	Diss.
	Roberts, Tobias	Camborne.
	Davis, William Richard	Douglas, I. of Man.
	Trevaskis, George Marrack	London.
	Whittaker, John Morris	Pendleton.
	Miles, Charles John	Bristol.
	Lowther, William	Swansea.
Equal.	Jackson, Frederic	Bawtry.
	Townend, Thomas Francis	Durham.
	Manning, Alfred	Strood.
	Hardy, Joseph Wrangham	Grantham.
	Owles, Arthur	Bungay.
	Rheeder, Thomas	Knaresborough.
Equal.	Aves, Arthur	Mansfield.
	Craig, George	Merthyr Tydvil.
	Marshall, Arthur Willows	Rusholme.
	Parker, Robert Henry	Barnstaple.
	Partington, John James	Macclesfield.
	Marshall, Arthur Barbarie	Crawley.
Equal.	Rayson, Arthur John	Diss.
	Shaw, William	Preston.
	Whelpton, George Bates	Retford.
	Boucher, Edward Grove	Birkenhead.
	Cule, Taliesin	Merthyr Tydvil.
Equal.	Baines, Arthur	Stoke-on-Trent.
	Carter, William Robinson	Rusholme.
	Gardner, Edward	Pendleton.
Equal.	Allison, Edward Arthur	Hull.
	Hinkley, Edward	Newcastle, Staffs.
	Holwell, Alfred	Loughborough.
	Shaw, William Hemingway	Easthorpe, Mirfield.
	Harris, David Philip	Merthyr Tydvil.
	Russell, James	Malton.
Equal.	Dalzell, Isaac William	Maryport.
	Garrett, John	Guilsborough.
Equal.	Colwill, Frederick Henry	Truro.
	Gallier, Robert	Tunbridge Wells.
	Hughes, Thomas	Dowlais.
	Wells, William	Chorley.
	Moses, Joseph	Bishop Auckland.
Equal.	Bailey, Samuel Goward	Stamford.
	Gillibrand, Thomas	Salford.
	Morris, David	Cardigan.
	Stevens, James	Stroud.
	Law, Alfred	Towcester.
	Hayward, Stanley	Reading.
Equal.	Dowdeswell, Jonathan	Tiverton.
	Maurice, Charles Roberts	London.
Equal.	Blades, William Wrench	Northwich.
	Marshall, James	Over, near St. Ives.
	Saunders, Francis Henry	Haverfordwest.
	Goddard, Enoch William	Nottingham.
	Harrison, James	Sunderland.
	Adams, Andrew Henry	Montacute.

Equal.	Fosse, Aleck Fare	Ilfracombe.
	Smith, Edward Michell	Weymouth.
Equal.	Elliott, Samuel, jun.	Liskeard.
	Fiddick, Thomas	Camborne.
	Lambert, Frederic Ernest	Hull.
	Piquet, Frederic George	Jersey.
	Sanders, William Josiah	Cardiff.
	Levy, Samuel Edward	Liverpool.
	Richardson, Sylvester	Reading.
Equal.	Hart, Philip	Bolton.
	Scott, Ebenezer	Chesterfield.
	Thomas, James Phillip	Hay.
	Carter, John James	Manchester.
	Gibbs, Francis Charles	London.
Equal.	Wray, Edward	Bishop Auckland.
	Owles, Charles Edward	Bungay.
	Woolley, Daniel	Stockport.
	Anderson, William Christopher	Epworth.
Equal.	Cullingford, Louis James	Bletchingley.
	Hudson, John	Whitchurch.
	Head, John	Waterfoot.
	Willson, Walter Henry	Homerton.
Equal.	Davies, Evan	Hirwain.
	Newton, Arthur James	Dudley.
	Ridge, Walter Henry	Preston.
	Thomas, William	London.
Equal.	Durnford, John	Maidstone.
	Holloway, Robert	Maidstone.
Equal.	Ingham, William	Blackburn.
	Smyth, Andrew Crawford	London.
	Albright, Alfred	Bootle.
	Seymour, Frederick Seth	Wimborne.
	Evans, Evan Thomas	Carmarthen.
Equal.	Carrell, George	Southsea.
	Kershaw, Edward	Manchester.
	Wills, George Sampson V.	Hay.
Equal.	Baldwin, Arthur Henry	Clifton, Bristol.
	Brown, George	Chesterfield.
	Hulme, George	Longton.
	Thompson, Charles	London.
	Maxey, John Thomas	Wisbeach.
	Goodrick, Owen Tudor H. P.	Bournemouth.
	Palmer, Charles Edward	Ely.
Equal.	Cullen, Richard Alma	Maidstone.
	Emett, Alfred	Preston.
	Hare, Marmaduke	Hull.
	Morton, Henry	London.
Equal.	Collingwood, John Henry	Grantham.
	Mills, Henry	Southport.
	Shone, John	London.
Equal.	Kellett, Arthur Hickox	Salford.
	Middleton, Ambrose	Nottingham.
	Young, Pelham Charles	Bristol.
Equal.	Amery, John	Taunton.
	Bastin, Alfred	London.
Equal.	Crang, Walter	Bath.
	Stephen, John	London.
Equal.	Burman, Charles Clarke	Liverpool.
	Peacock, William Henry	Durham.
	Welch, Alfred Edward	Great Yarmouth.
Equal.	Guy, William Adolphus	Kemberton.
	Hampson, Samuel	Stockport.
	Horsfield, Edmund	Leeds.
	Matthews, James Wavell	London.
	Peet, Henry	Spalding.
Equal.	Burrows, Walter Horncastle	Oldham.
	Cherrington, Geo. Widdowson	Newark.
	Ellwood, William	Grimsby.
	Hall, Robert William Emery	Hull.
	Hiscocks, Edwin Hillier	Liverpool.
	Mules, John	Milford Haven.
	Nott, Alfred	St. Asaph.
	Tildesly, John	Walsall.
	Hawken, Alexander M.	St. Austell.

SCOTLAND.

Fifteen Candidates presented themselves for this Examination in Scotland. The following nine passed and were duly registered as above:—

Clark, William Inglis	Edinburgh.
Graham, William Woodrow	Dalbeattie.
Laing, Alexander Gordon	Turriff.
Chalmers, Thomas	Westport.
Whitelow, James	Glasgow.
Key, George Brown	Dumbarton.
Peacock, John Rutherford	Glasgow.
Selbie, James	Aberdeen.
Storie, Peter	Drem.

The above names are arranged in order of merit.

The following is a list of the Towns at which the Examinations were held, with the numbers of Candidates annexed:—

England and Wales.

	Candidates.	Passed.	Failed.
Aberdare	2	1	1
Bangor	1		1
Barnstaple	2	2	
Basingstoke	1		1
Bath	2	1	1
Bedford	1		1
Belfast	1	1	
Belper	1		1
Birmingham	2		2
Blackburn	1	1	
Bolton	5	2	3
Boston	1		1
Bristol	2	2	
Cambridge	3	1	2
Cardiff	2	1	1
Cardigan	3	1	2
Carlisle	2	1	1
Carmarthen	1	1	
Carnarvon	1		1
Chesterfield	2	2	
Congleton	1		1
Christchurch	1	1	
Derby	1		1
Devonport	1		1
Diss	2	2	
Doncaster	6	3	3
Douglas	1	1	
Dudley	3	1	2
Durham	4	4	
Falmouth	1		1
Flint	2	1	1
Gainsborough	1		1
Grantham	3	2	1
Grimsby	1	1	
Harrogate	1		1
Haverfordwest	2	2	
Hertford	2	2	
Hitchin	1		1
Horncastle	1		1
Horsham	1	1	
Hull	7	4	3
Huntingdon	2	1	1
Jersey	1	1	
Kidderminster	1		1
Leeds	3	1	2
Leicester	2	1	1
Lincoln	1		1
Liverpool	8	5	3

	Candidates.	Passed.	Failed.
London	25	16	9
Macclesfield	1	1	
Manchester	15	10	5
Merthyr Tydfil	6	4	2
Neath	1		1
Newark	2	1	1
Newcastle-under-Lyme	1	1	
Northampton	2	2	
Norwich	1		1
Nottingham	6	3	3
Oldham	2	1	1
Peterborough	3	1	2
Plymouth	2	1	1
Poole	1	1	
Portsmouth	2	1	1
Preston	5	4	1
Reading	3	2	1
Retford	1	1	
Richmond (Yorks.)	2		2
Rochester	5	4	1
Runcorn	1		1
Ruthin	3		3
St. Austell	1	1	
Salisbury	1	1	
Scarborough	1		1
Sheffield	2		2
Shrewsbury	3	1	2
Southampton	1		1
Southport	2	1	1
Spalding	1	1	
Stamford	2	1	1
Stockport	3	2	1
Stoke-on-Trent	2	2	
Stourbridge	1		1
Stowmarket	1		1
Sunderland	3	1	2
Swansea	1	1	
Taunton	3	2	1
Tiverton	1	1	
Truro	3	3	1
Tunbridge Wells	2	1	
Walsall	1	1	
Weymouth	1	1	
Wolverhampton	1	1	
Yarmouth	3	3	
York	2	2	

Scotland.

	Candidates.	Passed.	Failed.
Aberdeen	4	1	3
Banff	1	1	
Dumfries	1	1	
Edinburgh	2	1	1
Glasgow	4	3	1
Haddington	1	1	
Lanark	1	1	
Stirling	1		1

The following were the Questions set:—

Time allowed: Three Hours.

LATIN.

Translate into English two at least of the following sentences:—

1. Tum demum Liscus, oratione Cæsaris adductus, quod antea tacuerat, proponit: esse nonnullos, quorum auctoritas apud plebem plurimùm valeat, qui privatim plus possint, quam ipsi magistratus.

2. Quibus rebus Cæsar, vehementer commotus, maturandum sibi existimavit, ne, si nova manus Suevorum cum veteribus copiis Ariovisti sese conjunxisset, minus facilè resisti posset. Itaque re frumentariâ, quàm celerrimè potuit, comparatâ, magnis itineribus ad Ariovistum contendit.

3. Sesquioxidum Acido misce, et balneo arenoso digere, subinde agitans, donec liquêtur. Deinde liquori frigefacto spiritum adjice et cola.

4. Misce, et applicetur paululum auri affectæ omni nocte cum gossipio.

5. Name the cases of neuter nouns, the terminations of which are alike.

6. Give the number and case of each of the following nouns, and state the declension to which they severally belong: *plebem, Suevorum, copiis, re, balneo, spiritum, auri.*

7. How do adverbs derived from adjectives form their degrees of comparison? Give examples.

8. The verb has two parts,—1, finite; 2, infinite. Name the moods and tenses of the finite.

9. To what questions does the ablative of *time* answer? Give examples in Latin.

ARITHMETIC.

10. An army consisting of 20,000 men took a city, and plundered it of £12,000. What was each man's share, the whole being equally divided?

11. If 50 men can do a piece of work in 100 days, working 8 hours per day, in what time will 120 men do it, working 6 hours per day?

12. Reduce $\frac{13\frac{7}{9}}{19}$ to a simple fraction.

13. Multiply $\frac{9}{10}$ by $\frac{2}{3}$ of $\frac{3}{4}$ of $\frac{5}{6}$.

14. Divide 125· by ·1045.

ENGLISH.

15. Explain the meaning of an abstract noun.

16. What is a synonym? Give one example.

17. Give the degrees of comparison of the following words:—*good, bad, much, little, beautiful.*

18. Why are auxiliary verbs employed?

19. Parse the following:—On that night he recognized his friend.

20. Write from fifteen to twenty lines upon *one* only of the following subjects:—

a. Sympathy.
b. Winter amusements.
c. The Crystal Palace.

January 17th, 1872.

MAJOR.

Three candidates presented themselves for the Major Examination; of these, *two* failed. The following passed, and was declared duly qualified to be registered as a Pharmaceutical Chemist:—

Schweitzer, Julius ....London.

MINOR.

Twenty-five candidates presented themselves for the Minor Examination; of these, *thirteen* failed. The following *twelve* passed, and were declared duly qualified to be registered as Chemists and Druggists:—

*Harry, Seth ....Gravesend.
*Shone, John ....London.
Pott, Frederic Fore ....London.
Walker, Joseph ....Dresden.
Townley, Thomas William....Ambleside.
Brewster, William ....Royston.
Matthews, Edward ....London.
Stanford, Joseph Henry ......Yarmouth.
Barron, Alexander ....Aberdeen.
Wilson, Charles Alfred ......Twyford.
Protheroe, Francis Richard H. Lydney.
Taylor, Richard Eccles ......Manchester.

The above names are arranged in order of merit.

PRELIMINARY.

Certificates were received from the undermentioned in lieu of this Examination:—

Lemmon, Eric ....East Grinstead.
(*Certificate of the College of Preceptors.*)

Robbins, James...............Bath.
(*Certificate of the University of Oxford.*)

Westwood, Amos ....Stone.
(*Certificate of the Royal College of Surgeons of England.*)

Williams, Llewellyn Preston ..Wrexham.
(*Certificate of the College of Preceptors.*)

Provincial Transactions.

MANCHESTER CHEMISTS AND DRUGGISTS' ASSOCIATION.

The Third ordinary Monthly Meeting of the Session was held in the Memorial Hall on Friday evening, Jan. 5th; Mr. J. T. Slugg, F.R.A.S., Vice-President, in the chair.

Messrs. Perry, Jones and Walton were elected associates.

The Chairman having expressed his regret that the President was prevented by serious illness from being present, called on Mr. Louis Siebold to deliver his lecture on Pharmaceutical Education, and its relation to the pharmaceutical examinations.

The following is an almost verbatim report of Mr. Siebold's lecture:—

Gentlemen,—Since pharmaceutical education has been made compulsory by the provisions of the Pharmacy Act, it has formed the subject of many an able discourse in different parts of the United Kingdom, but although much has already been said and written on this topic, much also has been left unsaid; and as the subject is undoubtedly one of great importance, I believe I am justified in inviting your attention to it on the present occasion. You will have seen from the title of my lecture, as announced at our last meeting, that I do not wish to confine my remarks to pharmaceutical education alone, but that I intend likewise to explain my views on the manner in which the education acquired by young men of our profession is tested by the pharmaceutical examinations.

The promoters of the Pharmacy Act had two principal objects in view, viz. to raise the chemists and druggists from the comparatively low position they occupied to the rank of professional men, and to protect the public from the dangers arising from the dispensing of medicines by

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* Passed with honours.

incompetent persons. By a singular and most unaccountable oversight on the part of those who framed the Act, this second object was frustrated, since the examinations, and consequently the education, made were compulsory for those only who want to carry on business on their own account, and not for the assistants, by whom at least nine out of every ten prescriptions are dispensed. There is not a single clause which protects the public by excluding unqualified men from the practice of dispensing so long as they choose to remain assistants; and the friends of the Pharmacy Act, who are loth to consider it as a complete failure, must cling to the first-named object with the hope of seeing it accomplished. To raise by means of scientific education the social position of men whose vocation is not inferior and not less responsible than that of medical practitioners, is a worthy and noble object, in the furtherance of which both interest and duty should alike prompt us all to aid.

Our esteemed Secretary, Mr. Benger, in his able paper on the education of pharmacists, has shown the necessity of a sound school-training on the part of young men who enter our profession as apprentices. A youth who on leaving school, say at the age of 15, does not possess the necessary knowledge of arithmetic, English and Latin, must be regarded as unfit for the duties of a chemist and druggist: for it would be almost fatal to his success in the career he had chosen if a portion of the valuable time of his apprenticeship were to be spent in picking up those rudiments of education, which he ought previously to have acquired at school. The introduction of a preliminary examination was therefore a wise and judicious step, and the experience of many of us points to the necessity of refusing in future to receive a youth as an apprentice before he has passed that examination. This being done, however, the youth will then be in a position to devote his entire attention and time to acquiring the practical and scientific requirements of his new calling. His daily occupation behind the counter will gradually make him acquainted with the English and Latin names, and the general nature of the numerous articles we have to deal with, with the manner in which they are served out to customers, with the different manipulations constituting the art of dispensing and the manufacture of the compound preparations of the Pharmacopœia. These subjects form the practical part of his study, and proficiency can only be attained by long-continued practice. Many chemists think—erroneously, I believe—that apprentices ought not to be allowed to take part in the dispensing of prescriptions on account of the grave responsibility connected with that duty. Their pupils therefore complete their term without having gained any experience in that branch, which is at once the most important and most legitimate part of our business, and consequently, instead of becoming useful assistants at once, they are compelled to take situations as so-called improvers, receiving no salary, in order to make up for their deficiency in this respect. The apprentice, I think, is entitled to be taught dispensing during his apprenticeship; and as dispensing cannot be learned by seeing it done by others, he must himself be engaged in its operations, which, of course, must be conducted under the supervision and control of his master or of a competent assistant.

With daily practice he will soon gain experience and confidence, and, at the expiration of his time, he will be a competent and trustworthy dispenser. Some will argue that watching a pupil whilst he is dispensing medicines is almost as troublesome as doing the work themselves, and this is undeniably true; but it is equally certain that we entirely fail in our duty towards our apprentices if we object to the trouble of instructing them. There can be no teaching without work or trouble, and whoever does not want to teach ought not to take an apprentice. The skill and knowledge acquired by a young man during his apprenticeship can, of course, be greatly augmented during his years of assistantship, and for that reason he will act judiciously by serving in several establishments and in different parts of the country, however much a long stay in one place speaks in his favour. An assistant who remains for four or five years in one situation may please his employer very much by so doing; but, as a matter of course, he cannot have the same chance of extending his experience as another who, within the same period, sees the business routine of four different establishments, each, no doubt, having its own peculiarities.

I have so far only alluded to the practical side of pharmaceutical education; and, though its importance is such that it alone might form the subject of a lecture, it is my intention on this occasion to dwell chiefly on the other side of the question, viz. the theoretical and scientific part; that branch of a young pharmacist's study which imparts life and intelligence to his practical acquisitions. A knowledge of chemistry and materia medica is indispensable if we wish to have a clear conception of the work we are daily performing, to say nothing of its being necessary for passing the examinations. Here, again, I maintain that the period of apprenticeship is the proper time for collecting the required information; as its very name suggests, it is essentially the time for learning; and those who deny their apprentices the time and opportunity for study incur a grave responsibility indeed. In large towns, where suitable lectures are provided for the purpose of facilitating the young man's exertions, he ought to be not only allowed but encouraged to avail himself of such means, unless his employer is in a position to instruct him efficiently. In country places, however, where such opportunities do not exist, the youth is chiefly dependent on books; but even this method of study should answer the purpose, provided the books be well selected and the help and advice of the employer not withheld. About six hours per week set apart for study and spent diligently will, as a rule, suffice for the student; not indeed to become a scientific man *par excellence*, for such is not expected or needed, even of the chemist and druggist of the future,—but to attain that amount of scientific knowledge which is required for the efficient discharge of his duties, and which will eventually ensure him an honourable place among his professional brethren. Great mistakes are made in the selection of books. Beginners should avoid large books, whose contents it would take them years to master; and they should remember that it is much better to know the rudiments of a science thoroughly and soundly than to have a superficial notion of most of its details. Short elementary books seem to me by far the most preferable for beginners, whilst the study of larger volumes may be highly recommended to more advanced students, say to assistants who have passed their examinations, and who aspire to distinguish themselves in one science or another.

In studying chemistry the beginner cannot be too strongly recommended to pay careful attention to the introductory topics of that science, of which I may name the following:—Definition and object of chemical science, definition of elementary substances and chemical compounds, the laws of chemical combination, specific gravity and its determination, and the molecular and atomic theory. These subjects form the very foundation of the chemical edifice, and unless they are thoroughly mastered by the student his knowledge of chemistry must, of necessity, be always cloudy and unsound. The sources, mode of preparation and main properties of the elementary substances and their compounds should then be gone through, and the use of modern symbolic expressions for their compositions and decompositions should be well understood and appropriated. The chemical compounds, both organic and inorganic, being exceedingly numerous, the pharmaceutical student should devote his attention chiefly, though not exclusively, to those used in pharmacy, and he must learn how to recognize those by tests, and how to detect impurities in the same. A knowledge of qualitative analysis is not absolutely necessary, but appears to me highly desirable; and where means and ways are at hand to obtain the same, it would be folly to neglect them.

The study of materia medica merits the same attention on the part of our young men as that of chemistry. It is here that they learn to recognize our numerous roots, leaves, seeds, gums, resins and the like by their outward appearance, to distinguish between good and inferior qualities of those substances, and to detect adulterations. The botanical and geographical sources of the drugs and their doses likewise form part of the study.

That branch of materia medica which is called pharmacology is taught principally to medical students; it treats chiefly of the medicinal effects produced by the substances alluded to on the different organs of the human body, and a superficial knowledge of it amply suffices for the purposes of a chemist and druggist. I hardly need to point out the great utility, or rather the necessity, of a good acquaintance with chemistry and materia medica to the pharmacist. Without it, his daily work will be that of a machine, and not that of a reflecting being, and great indeed must be the danger to which his ignorance may expose him. We should be able to judge whether the articles we receive from wholesale houses are really what they are meant to be, and whether they are good and pure enough for the intended purposes. Wholesale houses may make mistakes, which, if not discovered by us, might lead to serious results. Not very long ago powdered binoxalate of potash was sent to me instead of cream of tartar, and was labelled "potass. bitart.," and, if I had overlooked the mistake, who knows what the consequences might have been? The wholesale druggists of this country deserve the highest credit for the careful and admirable manner in which their business is conducted, and mistakes of a serious nature very rarely occur; yet we ought not to be entirely dependent on them, and we are so if we cannot identify the substances purchased or see whether they are of the required quality, strength, etc.

Need I say a word about the importance of our knowing the doses of poisons and those preparations of them with which we are dealing? Who can deny that, but for our knowledge and care in detecting overdoses of poisons, hundreds of human lives would be sacrificed every year by the errors in medical men's prescriptions? Nothing, indeed, can be more apparent than the absolute necessity of our daily manipulations being guided and assisted by scientific knowledge, but, clear and true as this is to everybody, in reference to chemistry and materia medica, the same, I feel sure, cannot be said with regard to botany. I venture to assert that a chemist and druggist can fulfil all his professional and business duties, in the most perfect and efficient manner, without knowing much of botany, and, unless this assertion can be disproved, you must admit that the study of that science need not form part of a pharmacist's education. No doubt it is very interesting, highly instructive and cultivating to the mind; but so are astronomy, anatomy, physiology and other branches of the great domain of natural science, which nobody deems necessary to force upon us. In private conversation on this subject, I have met with the reply that many chemists in country districts collect, or cause to be collected, some of the leaves, roots, etc. used in pharmacy, from plants growing in their neighbourhood, such as *Digitalis*, *Conium*, Valerian and others, and that they could not do this without being able to recognize those plants. This is very true; and, although, by far the greater number of chemists do not collect and dry, but purchase their drugs in the dried state, as well as the narcotic extracts made from the fresh herbs, I should be the last to dispute the desirability of chemists and druggists knowing the indigenous plants of the British Pharmacopœia. But there is a vast difference between being able to recognize a few dozen fresh plants, and possessing an intimate knowledge of structural and systematic botany. Upon drying parts of fresh plants, such as *Hyoscyamus* leaves, for instance, their appearance changes so very much, that the shape and other characteristics of the fresh articles differ widely from those of the substances in the dried state, in which only they can be kept by us. For the latter, we are dependent upon our knowledge of materia medica, and students of this science cannot be too strongly recommended to avail themselves of a good collection of specimens, as supplied by several wholesale houses. But though I feel persuaded that the study of botany is not needed by our young men for the purposes of their profession, I do not forget that it is required in the Minor and Major examinations, and I must, therefore, advise them not to neglect it, but to make themselves familiar with the organs of plants as well as their functions, and, above all, with the characteristic features of the indigenous medicinal plants. Here, as in the study of materia medica, specimens are very useful, and collections of dried plants, as well as coloured plates of the fresh ones, are of great service. If the pupil has the opportunity, he should get up an herbarium by collecting and drying his own plants.

The fourth subject which requires the attention of our pupils is called pharmacy, and comprises the English and French systems of weights and measures, the antidotes for poisons, the methods for making tinctures, extracts, emulsions, etc., the strengths of some important solutions and compound preparations and the reading of physicians prescriptions; in fact, all those details of pharmaceutical knowledge which cannot exactly be treated under the heads of chemistry and materia medica. With the aid of his employer or teacher, the student can easily collect the requisite information from the Pharmacopœia, from the copy-book for prescriptions and from his own practical occupation.

Some apprentices commit a great mistake in devoting the first year to the study of one science—say chemistry—only; then taking materia medica in the next, and perhaps botany and pharmacy in the third year. In this way they will probably forget during the second and third years what they have learnt during the first. They will work best by following the plan, almost universally adopted in schools, of devoting a certain time—say about two hours a week—to each subject, thus going through them all within the same period; and in that case the student will find that the facts of one science will help him to understand those of the others.

From the question of pharmaceutical education, let us now turn our attention to the tribunals of Bloomsbury Square, London, and Princes Street, Edinburgh, by whose judgment it is decided whether our students' labours have ended in success or failure. First of all, let us bear in mind that the only legitimate object of pharmaceutical examinations is, or at least ought to be, to ascertain whether the candidate presenting himself is, or is not, competent to perform the important functions of a chemist and druggist; to admit to the rank and privileges of our profession all who are qualified for its duties, and to reject and exclude those whose shortcomings make them really unfit for the position they aspire to fill. Hence it follows that, in the Minor examination at any rate, nothing should be demanded which a thoroughly qualified chemist can well dispense with; whilst such knowledge as is by no means essential, but which may be considered desirable or useful for us (in our capacity as chemists, of course), might be expected in the Major examination. Let us now see whether these examinations are conducted with sufficient ability and fairness to ensure the attainment of the results above alluded to. As a teacher of pharmacy, I have, of course, felt deeply interested in this important question, and have collected as many and as full reports as I could of the details of the Minor and Major examinations (chiefly of the former), both from successful and rejected candidates. You all know that not unfrequently able and thoroughly well qualified men fail, and that others, though quite incompetent, succeed. From my own experience I can state that young men upon whom I had every reason to look as ornaments to our profession,—who had worked hard and earnestly, and whose knowledge and abilities ought to have carried them through the Major with honours, have been rejected in the Minor and even in the Modified examinations. Such, I am ready to admit, are rare exceptions, but they are exceptions of a kind which ought never to occur; whilst instances in which candidates of lesser pretensions, though in every respect amply qualified for their duties, have met with the same fate, are far more common.

In the face of such facts, it is, I believe, the duty of all chemists and druggists to understand the causes of the many unnecessary failures, and to exert themselves, individually and as a body, to remove those causes by demanding a reform of the present system of examinations. That something is wrong is felt by almost everybody interested in the matter, for nobody can bring himself to believe in the real unfitness of so great a number of men as are annually turned back; and I will now endeavour to show you, as well as I can, what there is wrong.

In forming our judgment on this important point, we must receive with due caution the reports of unsuccessful candidates, who are often disposed to conceal or mitigate their own shortcomings, and to find fault with the examiners. What they tell us of their own nervousness, and how this was increased by the examiners' harshness, cannot be generally considered as impartial; and though there is little doubt that, in many instances, some of the examiners have failed to remove the excitement and temporary confusion of nervous candidates where they could have done so, and that in some cases such an excited state of mind has actually been augmented by uncalled-for harshness and impatience, yet there is evidence enough to show that the majority of the examiners have not neglected their duty in this respect. Therefore, I do not believe many of the failures alluded to can be attributed to nervousness. Neither can I share the opinion entertained by many that luck has a great deal to do with success or failure in our examinations, though I do not dispute altogether that luck or ill-luck may have a little influence on the place which a successful candidate's name will occupy in the list arranged according to the order of merit, or that now and then a man who is hardly qualified may pass by mere luck. But surely the many undeserved failures referred to cannot be explained in this way, unless we want to charge the examiners with utter imbecility. Partiality on the part of the gentlemen of whom the Boards of London and Edinburgh are composed is altogether out of the question. We are driven to seek an answer to our inquiry in the nature of the subjects on which a knowledge is demanded from our young men.

I have already stated my opinion as to the relative value of different scientific subjects for the purposes of a chemist and druggist; and, as far as my experience goes, I can say that our young men share the views I have expressed, especially so with reference to botany. They feel that a subject is forced upon them which they regard as useless, and, with the exception of a few who take a special liking to it, they study it with reluctance. The result is, that they will not, as a rule, acquire much real knowledge of botany, and that a portion of their valuable time is wasted which might be advantageously devoted to the important study of chemistry and materia medica. But unfortunately botany is by no means the only unnecessary and undesirable topic required by our present examiners. A great deal of what they ask on the other subjects, and especially on pharmacy, deserves to be called worse than useless. The candidates are expected to know by heart the component parts of compound powders, pills, confections, mixtures, and other preparations of the Pharmacopœia, and to be able to mention the preparations for which any given substance, such as aloes, resina, acacia, and the like are used. The practical experience of men who have served behind the counter for many years will no doubt enable them to mention a good many such details, if at leisure for reflecting, but to recite them well in an examination, where the answers must be given as soon as the questions are asked, necessitates the learning off by heart of the greater part of the Pharmacopœia, especially on the part of those who wish to pass before they have served as assistants. This is certainly not learning, but cramming; and the examiners who compel students to waste their time in such a manner incur the responsibility of encouraging that cramming process which is so distasteful to a thinking and intelligent student. What can be the use of such knowledge, if knowledge it dare be called? Are our assistants to make the compound preparations from memory without consulting the Pharmacopœia? I have, of course, nothing to say against candidates being required to know the proportion of poisonous ingredients, such as opium, in preparations used internally (not in plasters, ointments, etc.). But the subjects above alluded to serve no practical purpose whatever; they are worked up by the student so that he may know them on the day of the examination, no matter how soon afterwards they are forgotten. From my own experience as a teacher, I can state that stupid and unreflecting pupils are most generally inclined and ready to get up this kind of knowledge which requires no thought, whilst intelligent students, who are eager to collect useful information and true lasting knowledge, dislike the practice of cramming.

The remarks I have made on this point are applicable also to the custom of requiring our young men to recognize extracts and tinctures. The recognition of the former is, to a great extent, guesswork; and though a student may succeed, by several days' practice, in knowing, or rather in guessing most of the extracts of his own collection for the time being, he would fail to do so with the extracts belonging to somebody else. As to the tinctures, I admit that about two dozen of them can be recognized by their odour, but a cold may at any time deprive us of the sense of smell, and even without a cold the most experienced chemist may easily fail to recognize an important tincture if he is compelled to exert his nasal organ by smelling a number of strong tinctures in succession. Nothing of the kind is required in the Pharmaceutical Examinations on the Continent; and it seems most ridiculous that the success of our young men should be endangered or lessened by such an incident as a cold.

The inability to recognize tinctures and extracts has proved fatal to many a student, especially at the Modified examination, in which a candidate is not afforded the chance of showing his scientific attainments, though they may be more than sufficient for the Major, as the very subjects against which I have so strongly protested form the principal requirements of the Modified examination. In the Minor examination there is some chance for the candidates to make up for their apparent deficiency by a display of real scientific knowledge; though even in this examination cases have occurred in which such attainments, great though these were, have not saved them from the fatal consequences of their shortcomings in cramming, guessing and smelling. I understand that the composition of the compound preparations of the Pharmacopœia, and the recognition of tinctures and extracts, have not been so much insisted upon within the last twelve months as formerly, and that candidates who fail in those subjects may yet pass the Minor examination, but they must look for their names at the bottom of the list. That, gentlemen, is no improvement at all. The most skilful dispenser, provided with more than ample knowledge on chemistry and materia medica, will still fail in the Modified, Minor or Major examination if he has not made himself acquainted with those subjects, which an unbiassed man must admit to be utterly useless for him. Botany, though useless, is at any rate interesting; but can the same be said of the other topics against which I have spoken?

It matters little whether or not these obnoxious requirements are less insisted upon now than before. What we want, and what we have a right to demand, is their exclusion from all the examinations. They are an intolerable burden to the candidates, and certainly reflect no credit on the examiners. For reasons already explained, the omission of botany too appears to me highly desirable.

There is yet another subject which I feel sure ought to be excluded from the examinations, viz. dispensing. An examiner cannot possibly judge of a dispenser's abilities by seeing him prepare a single prescription. Many clever men are rather awkward in their manipulations when they are being watched, more particularly so when they work in a strange place, and are being watched by an examiner. A slight mishap or accident may thus cause an experienced dispenser to appear deficient; whilst a far less qualified candidate, possessed of plenty of self-confidence, will probably pass first-rate. We generally find the most ignorant persons have the highest opinion of themselves, are the least nervous and the most plucky. No sensible chemist would ever think of forming a correct estimate of the qualification or disqualification of a newly-engaged assistant by seeing him dispense the first prescription. Is it likely, then, that an examiner should be able to do so? The reading of prescriptions and the detection of errors and overdoses forms a part—a very legitimate one, I think—of the examinations; and if the candidates were asked to explain how they would dispense the prescriptions placed before them, their knowledge of dispensing would be put to as fair a test as an examination can afford. The Latin directions of those prescriptions ought to be such as a dispenser commonly meets with in his occupation. The members of the medical profession are beginning to use plain full English directions in place of the less distinct Latin abbreviations, in which one letter frequently stands for a whole word, the same letter being sometimes used for two or three different words; and I believe the time is fast approaching in which the English language alone will be employed for the directions of English prescriptions. Some of the directions which candidates have to read and translate in the Modified and Minor examinations are of a most uncommon kind, and contain terms which our young men never meet with in the prescriptions they are daily dispensing.

I trust I have succeeded in pointing out the main causes which lead to the failure of many well-qualified men in the pharmaceutical examinations, and in throwing some light on the success of others who do not deserve to pass. Amongst the latter, there are many who are crammed up not only in those subjects in which the crammed student must have very great advantages over all others, but also in the legitimate and scientific requirements. I am in a position to state that men who had learnt off by heart about five hundred answers to five hundred questions, such as they knew were generally asked in the Minor examination have passed after a course of six or eight weeks' cramming. Such facts have oozed out, and the examiners, I understand, are determined to prevent such candidates from passing in future, by making the examinations more difficult still. If it is really true that the examiners are about to adopt that plan, or that they have adopted it already, it would be clear that they themselves admit their having hitherto been imposed upon by crammed and ignorant men. Nothing, indeed, could exceed the admirable candour of this admission. Need any one tell you that any competent examiner ought to be able to distinguish between real knowledge and superficial cramming, without making the examinations still more stringent than they have been?

In drawing to a close, I feel persuaded that you will all heartily share my conviction of the necessity for a thorough reform in the present system of examinations. If such important cities as Manchester and Liverpool are denied the privilege of local examinations, and, if our young men are put to the expense of presenting themselves in London or Edinburgh, we are doubly entitled to demand that the examinations shall be conducted in such a manner as to draw a fair line of distinction between qualified and non-qualified candidates, so that a chemist who is fully competent for all his duties may not be rejected, but that his name will occupy the deserved place in the list of the successful.

The Chairman referring to the remarks of Mr. Siebold, on the exemption of assistants from compulsory examination, said that the provisions of the Pharmacy Act were very incongruous and unfair in one respect. He could, for instance, open a number of shops in different parts of the city, or even in different towns, and place in each of those shops an unexamined assistant to manage its business; and even if he never entered the shops once from year's end to year's end himself, provided the businesses were *bonâ fide* his own, the arrangement would be strictly legal; the Legislature did not interfere with him. Again, if he were taken seriously ill, and should be laid aside from business for any number of years, so as not to interfere in its management in the slightest, it would be perfectly legal for him to leave it under the entire management of an unqualified assistant as long as ever he liked; but, if he died and his widow should procure the services of a gentleman who had passed his Major examination, and be one of the most competent men in England as manager, she could not legally carry on the business for a day. This he thought as absurd a piece of legislation as was ever placed on the statute book, and was very hard, to say the least, on the widows of druggists.

The practical education of apprentices in dispensing was a difficulty in this respect, that on the one hand, where a good dispensing trade was carried on and one or two assistants were kept, an employer liked to be able to tell his customers with truth, that their prescriptions were always compounded by competent persons. Now, if this were literally carried out, and faith kept with the public, an apprentice in such an establishment would never have the chance of dispensing a single prescription. On the other hand, no druggist had a right to take an apprentice, and probably receive with him a handsome premium, and send him away at the end of his term unable to dispense. He thought that by tact and management there was a mode of steering between Scylla and Charybdis. His own views and practice were these. For the first two years he would not allow an apprentice to have anything to do with a prescription. He should, however, expect the youth during that time to become thoroughly acquainted with the ordinary names and terminology of all the drugs and preparations in the place. This he would learn by unpacking them, checking off the invoices, putting them into stock, and every day filling up drawers, bottles, jars, etc. Then he would put him occasionally to copy a prescription, for some time at first always reading it over with him and explaining anything unusual in it, but always checking after him. Having in this way become quite familiarized with the various drugs and compounds used in dispensing, and feeling quite at home in reading prescriptions, during the last year of his time he may be set occasionally to dispense under supervision; and when his term is completed, if he be a young man of ordinary intelligence, he will be competent to take a junior assistant's situation at least.

The chairman agreed with Mr. Siebold in ridiculing the practice of cramming a young man's head with a quantity of hard botanical names, in order to qualify him for the duties of his calling; but he thought a student should be examined as to his ability to recognize the various preparations which he will have daily to handle.

Mr. Wilkinson said, I quite agree with much that Mr. Siebold has said, I am quite of the opinion that we ought not to take apprentices who are unable to pass the Preliminary; it is absolutely necessary that they pass it some time or other, and if not passed at first a great deal of time is wasted in studying for it which ought to be occupied in learning something else. I also fully agree with everything he says about the study of botany, and think that a great amount of botanical knowledge is required from the students which is not of the slightest use whatever. I cannot imagine why so much importance is attached to this science, when in actual practice a botanical question hardly occurs to an ordinary druggist in a lifetime, and if he can recognize the officinal plants in the fresh or dry state, it is quite as much as he requires.

I cannot quite agree with Mr. Siebold about the "preparations" question; I do certainly think that a man should not be rejected because he cannot recognize certain tinctures, extracts, or powders, or is unable to tell their composition, but at the same time he ought to know something about them. I should not expect a young man to make the B. P. preparations without the book, but still he should know what the ingredients are; and after all, what is a man to be examined on if not on things he is supposed to be familiar with?

As to the instances of good men being rejected, and inferior ones being passed, that occurs in all kinds of examinations, and I believe it depends a great deal on luck and pluck. An inferior man may meet with questions at the outset which he answers readily and correctly; this gives him confidence, and his examiner a good opinion of him, whilst the better man, nervous and flustered to begin with, perhaps stumbles at the first question asked him, loses his head entirely, blunders and hesitates at every question till he wearies out the patience of the examiners, who are after all only men, and it is not much to be wondered at if they do get a little impatient after five or six hours' harassing work. No doubt there is great room for improvement, but I think the accounts we hear depend very much on the success or otherwise of the candidate, the rejected one laying all the blame on the examiners, whilst those who pass describe them as being all that is lovely and good.

Mr. Benger, in proposing a vote of thanks to the lecturer, said he was very glad to hear Mr. Siebold's strongly expressed condemnation of the system of cramming, and he hoped with him, that the examiners would not slacken their endeavours to distinguish between superficial preparation and sound practical knowledge. He was disposed to agree with Mr. Siebold as to the comparative uselessness of botanical knowledge to the ordinary pharmacist of to-day, whilst chemistry, materia medica, and pharmacy made such pressing claims on his time and energy. He believed it was Professor Huxley who had recently advocated the omission of botany from the curriculum of medical students, and had argued that it was as logical to consider the surgeon incompetent to use his lancet or knife until he was thoroughly acquainted with the manufacture of steel, as it was to insist on the physician knowing the "botany" of his vegetable remedies.

Mr. Mumbray seconded the vote of thanks, which was carried with acclamation.

Mr. Siebold briefly replied, and the meeting terminated.

GLASGOW CHEMISTS AND DRUGGISTS' ASSOCIATION.

The second half of Session 1871–72 of this Association was inaugurated on Wednesday evening, 10th inst., in the usual place of meeting, Anderson's University; Mr. Thomas Davison, President, in the chair.

An Address was delivered on the occasion by P. A. Simpson, Esq., M.D. (Professor of Medical Jurisprudence, Anderson's University), who chose for his subject, "Native Poisons of India." Amongst the specimens which were exhibited and illustrated in course of the address, were Indian hemp, datoora, oleander, etc., together with a series of the "new safety poison bottle," presented to the Association by Messrs. Lynch and Co., 171a, Aldersgate Street, London, E.C. At the conclusion of the address, which was listened to with the greatest attention by the largest meeting of the Association this session,—

The Chairman proposed a vote of thanks to Professor Simpson, which was very heartily responded to.

BRISTOL PHARMACEUTICAL ASSOCIATION.

The Monthly General Meeting of the Association was held on Friday, January 12th; Mr. Townsend, President, in the chair.

The minutes of the previous meeting were read and confirmed.

The President read the list of subscriptions he had received for the Chicago Chemists' Fund.

The meeting being the occasion for the reading of papers and discussions upon pharmaceutical subjects,

Mr. Schacht made a few remarks upon a prescription he had had to dispense, consisting of tincture of iodine and liquid ammonia, showing that when first mixed the highly explosive iodide of nitrogen is formed, which requires several hours, and under some circumstances days, for solution and conversion into iodate of ammonia. He recommended that such a mixture should never be sent out until that change had become complete, lest any portion, accidentally becoming dry, might explode, and create alarm.

Mr. Giles introduced the subject of the pharmaceutical preparations of nux vomica. He thought that proof spirit (or a slightly stronger spirituous mixture, say 2 parts rectified spirit and 1 part water) was to be preferred for preparing the tincture, as it exercised a better solvent action upon nux vomica seeds than did rectified spirit, also because the tincture so prepared made more permanent mixtures with water when diluted according to the usual prescriptions. For the same reasons a dilute spirit might be used for preparing the spirituous extract. It had not appeared that the *quantity* of extract was materially increased when dilute spirit was employed, but there was a marked difference in the appearance of the product, indicating the presence of constituents not extracted by the solvent action of rectified spirit. Specimens were exhibited in confirmation of these statements and opinions. The paper went on to review the pharmacopœial tinctures generally with reference to their *alcoholic* strength, which the author thought was deserving of more attention than it appeared to have received. Out of the sixty-five pharmacopœial tinctures seven (including the ammoniated and ethereal tinctures) were excepted, and the remaining fifty-eight simply alcoholic tinctures were divided into two classes, viz.,

1st. The tinctures (43 in number) of crude organic products—as barks, roots, leaves, etc.

2nd. The tinctures (15 in number) of secondary products—as gums, resins, extracts, etc.

The tinctures of the first class were stated to be generally of *proof* strength.

The tinctures of the second class are generally of rectified spirit strength. Proof spirit therefore appeared to be employed when a general solvent was wanted; rectified spirit being used for purpose of *selection*.

Nux vomica is one of the 43 primary organic substances which are exceptionally treated with rectified spirit, in company with aconite, arnica, capsicum, cubebs, pyrethrum, veratrum viride, and ginger, and the reason is not obvious.

It was suggested (as previously stated) that the spirituous strength might be advantageously reduced in the case of nux vomica, and a similar investigation might be applied to other cases. There was no magic in the proportions of proof spirit which rendered it necessarily the most suitable solvent for all materials. The author considered that the strength should be increased in the case of calumba to the proportions of 2 parts rectified and 1 part water, and that proof spirit was decidedly too weak for operating upon sumbul, which was much more satisfactorily treated with rectified spirit, although possibly an intermediate strength might afford equally good results. The older Pharmacopœias recognized this view, and the example of tinct. aloes and tinct. rhubarb was quoted. These preparations perhaps scarcely deserved the name of *tinctures*, in the form in which they were presented by the London Pharmacopœia, 1824,* but those formulæ were evidently based upon a rational recognition of the objects to be attained which we fail to discover in more recent editions, where the choice is limited to two strengths somewhat accidentally established.

Mr. Stoddart exhibited a sample of iodide of potassium, supposed to be of German origin, which he had ascertained to be contaminated with 10 per cent. of iodate of potash.

Each of these communications received ample discussion.

The subject of early closing was then introduced by the President, and continued by several members. Finally, the following resolution, proposed by the President, and seconded by Mr. Giles, was passed, "That the Council be requested to take the subject of the hours of closing into consideration, and to report thereon."

Proceedings of Scientific Societies.

SOCIETY OF ARTS.

Dyes and Dye-Stuffs other than Aniline.†

BY DR. CRACE-CALVERT, F.R.S.

Lecture IV.

Quercitron, Fustic, Persian Berries, Weld, Aloes, Turmeric, Annatto, Ilixanthine, Lakao, Tannin matters, Gall-nuts, Sumach, Divi-divi, Myrobalans, Catechu.

(*Continued from page 575.*)

Ilixanthine is the name given to the pale primrose-yellow crystals obtained by Dr. Schunck from the leaves of the *Polygonum Fagopyrum*, or common buckwheat. This body, to which he gives the formulæ $C_{30}H_{20}O_{20}$, is only sparingly soluble in hot and cold water, but more soluble in alcohol. Strong sulphuric acid changes its colour to a deep yellow without decomposition. It yields on a piece of calico mordanted with alumina a dark yellow colour, with tin a light yellow, and with oxide of iron various shades of yellowish-brown, according to the strength of the mordant employed.

Lo-kao.—In 1851 and in 1852 public attention was drawn by several English gentlemen to samples of a green colouring-matter imported from China; in 1853, Messrs. Guinon, of Lyons, imported such quantities as to enable them to dye silk for the requirements of the trade. The silks so dyed were known by the names *Vert-Vénus*, *Vert-Azof* and *Vert-Lumière*, and were especially admired from their remaining green in artificial light. They are not, however, now produced, as the colours were unstable, and Messrs. Guinon, Mamas and Bonnet found that they could produce greens which maintain their colour in artificial light by first dyeing the silks in Prussian blue, and then immersing them in an acidulated bath of picric acid. It is interesting to observe that, if indigo be substituted for Prussian blue, the colour appears blue by artificial light.

Lo-kao is the only substance with which I am acquainted capable, with proper reagents, of producing the seven colours of the spectrum.

M. Charvin, of Lyons, obtained lo-kao from a weed indigenous to Europe, the *Rhamnus catharticus*, and received for his discovery a gold medal, worth 6000 francs, from the Chamber of Commerce of Lyons. All these vert-lumières are, however, now replaced by the brilliant greens obtained from aniline.

Tannin matters can be divided into two classes, those which give a blue-black precipitate with persalts of iron,—such as gall-nuts, sumach, divi-divi, myrobalans and valonia,—and those which give a green coloration with persalts of iron, such as catechu, gambier, gum kino, and elder, larch and willow barks.

The first class are characterized by containing two acids, which have received the names of tannic and gallic acids.

Tannic acid, which is the all-important compound in this class of substances, was extracted some years ago by the following simple process, devised by M. Pelouze. It consists in treating in a displacement apparatus, coarsely ground gall-nuts with ether which has been previously well shaken with water (during this process it has taken up one-tenth of its weight of the water). The ethereal solution, on being allowed to stand, separates into two layers, the upper one being nearly pure ether, and the lower one being an aqueous syrupy solution of tannin, which only requires to be evaporated in a water-bath to obtain the tannic acid as a pale yellow spongy mass, inodorous, and having a most astringent taste. As is seen by the process of extraction, it is soluble in water, but insoluble in ether. It is soluble in alcohol. It is characterized by giving a blue-black precipitate with persalts of iron, but none with protosalts, and a white precipitate with tartar emetic or salts of lead. It gives a precipitate with gelatine and the vegetable alkaloids, and turns rapidly brown or black in presence of air and caustic alkali.

Tannic acid is a glucoside, decomposed by acids into a peculiar sugar and gallic acid, as seen by the following formulæ:—

$$\underset{\text{Tannic acid.}}{C_{27}H_{22}O_{17}} + \underset{\text{Water.}}{4\,H_2O} = \underset{\text{Gallic acid.}}{3\,(C_7H_6O_5)} + \underset{\text{Sugar.}}{C_6H_{12}O_6}.$$

(*To be continued.*)

Parliamentary and Law Proceedings.

Alleged Poisoning of a Medical Officer.

On Wednesday evening, January 10th, about eight o'clock, Mr. Andrew Harris, the senior assistant medical officer at the Workhouse Hospital, New Bridge Street, Manchester, died suddenly, and the circumstances attending his death were such as to excite grave suspicions that he had been poisoned. The inquiries made resulted in Mrs. Hannah Steele, the head nurse of the lunatic ward, being apprehended on the charge of having caused his death. On Thursday morning she was brought up at the City Police Court, charged with having caused the death of Mr. Andrew Harris, and with also having poisoned two attendants in the workhouse. The prisoner is about fifty years of age.

Mr. W. A. Patchett, surgeon at the Manchester Workhouse, said: Between a quarter and half-past eleven yesterday morning was the last time I saw Mr. Harris alive. He was conscious, and he said when I entered the room, "Patchett, my dear fellow, I have been poisoned." I had seen him the night before in good health. Yesterday morning when I saw him he complained of a burning pain in the throat. He was sitting in his chair. He said, "They have put something in my milk." I asked where the milk was, and he said,

* *Tincture of Aloes.*		*Tincture of Rhubarb.*	
Rectified Spirit	1 part.	Rectified Spirit	10 parts.
Water	4 parts.	Water	18 parts.

† Cantor Lecture, delivered Tuesday, Feb. 28. Reprinted from the *Journal of the Society of Arts*.

"Margaret (the servant) has taken it and thrown it away." He was quite unconscious when he died.

Mr. Headlam: Is anybody else ill?

Mr. W. A. Patchett: Yes, Margaret (Mr. Harris's servant) and my own servant are ill.

Chief Inspector Henderson: When deceased complained of the burning in his throat, Margaret tasted the tea. He said, "It is not in the tea, Margaret, but in the milk." She tasted the milk, and found it was bitter. Deceased desired her to throw both the milk and the tea away, but the woman, instead of doing so, took it to the scullery, where she met Mr. Patchett's servant. Both tasted it and became ill.

Mr. Patchett: The two women had the same symptoms as Mr. Harris. He asked deceased who put the poison in the milk, and he said, "Mrs. Steele, I believe." Mrs. Steele had been at the workhouse about eighteen months, and had always borne a very good character. Mrs. Steele was not present when deceased made the statement about her. He was quite sensible, but not at that time apprehensive of dying.

Margaret Lythgoe said that when she served Mr. Harris with his breakfast he appeared quite well. She obtained some milk from the workhouse dairy; half of which she put on the table and the other half in the scullery. Mr. Harris rang for her and asked her what she had put in his tea. He said, "There is something strange about it: will you be so kind as to taste it?" She took a teaspoonful out of his cup and drank it. It burnt and tasted bitter—something like dandelion. She tasted the milk by itself. He had put only a little drop in his tea. She went for the remainder, and he drank all after tasting it. It was all right. She saw a person named Mrs. Steele in the room about half-past eight. Mr. Harris had not come out of his bedroom. His breakfast was on the table. After he had drunk of this milk, he went to the surgery to look after his patients, and when he came back he could scarcely get across the carpet. Mr. Harris told her to throw the other half gill of milk and the tea away. In answer to a question as to the effect the milk had on her, witness said she lost her eyesight and had a burning taste in her throat for half an hour.

For the defence it was urged that there was no evidence against the prisoner, but the magistrates decided on remainding her for a week.

On Thursday Mr. Hereford, the city coroner, opened the inquest at his court, in St. John Street, touching the death of Mr. Andrew Harris.

Mr. Samuel Buckley, house physician at the Royal Infirmary, said: Dr. Wilkins came to the infirmary about three o'clock on Wednesday afternoon, and requested me to take a galvanic battery down to the workhouse, as the medical officer there was supposed to be suffering from atropine poisoning. I arrived there about a quarter-past three. The deceased was in bed, insensible and comatose. I noticed the pupils were largely dilated, and the face was flushed and swollen. Those symptoms remained until he died. I remained with him until about seven o'clock, when I was called away to the infirmary, and returned again about the time he died. Two or three times he was almost dead—pulseless, life being induced merely by an artificial respiration. The battery was applied. The opinion I formed when I first saw him was that the case was hopeless. Morphia injections were given subcutaneously as an antidote to atropine.

The Coroner: What made you think he had taken atropine?

Witness: It was merely a surmise from the symptoms. The drug is commonly used in ophthalmic cases for dilating the pupils. I made a *post-mortem* examination by the coroner's order.

Coroner: Were there any other symptoms, such as rigidity of the limbs, as further led you to surmise that the poison was atropine?

Witness: Nothing further than what I have stated. I made the *post-mortem* examination yesterday afternoon. I was assisted by Dr. Carruthers, the late house-surgeon of the infirmary. Dr. Simpson, the physician of the infirmary, and other medical men were present. I found congestion of the brain, but not much, with effusion of bloody serum into the ventricles. The lungs were much congested, and the heart was filled with dark clotted blood. The stomach was empty, and congested in patches near the left side of the stomach. This might have been due to the use of the stomach pump, to the administration of an emetic of sulphate of zinc, or to efforts at vomiting. The remainder of the abdominal organs were slightly congested, but in other respects healthy. The dilatation of the pupils continued after death. I found no disease or lesion of any vital organs to account for death. I believe death to have been caused by poisoning.

The Coroner. Do you entertain any doubt of that?

Witness: None. I believe death to be caused by poison acting directly on the brain. From the symptoms I observed myself, and those observed by others previously to my seeing him, I concluded that atropine, the active ingredient of belladonna, was the only thing likely to be compatible with all the symptoms, although two other poisons should produce closely analogous results. The *post-mortem* symptoms I observed were such as I should expect to find from poisoning by atropine, though they are not definite or conclusive in character.

The inquest was then adjourned until the 24th inst., to allow time for a chemical and physiological investigation of the contents of the stomach.

The Brighton Poisonings.

On Monday, January 15, the trial of Christiana Edmunds for the murder of Sidney Albert Barker, four years of age, was commenced at the Central Criminal Court. The evidence for the prosecution, so far as it concerned the obtaining of poisons by the prisoner, was nearly the same as that given at the preliminary investigations before the magistrate, which will be found at pp. 176, 196, 215.

In his speech for the defence, Mr. Serjeant Parry said he could not deny that the prisoner obtained strychnia from Mr. Garrett to the amount of 60 grains between the months of March and July last, but he confessed he was astonished to find that gentleman in so short a time supplied the prisoner with poison capable of killing sixty or seventy people, which she might have used as she pleased. The plea of insanity was that which was principally relied on by the defence, prisoner's father having died in a lunatic asylum, and several of her relations having been afflicted with insanity.

The jury returned a verdict of "Guilty," and sentence of death was passed upon the prisoner.

Reviews.

Year-Book of Pharmacy: with the Transactions of the British Pharmaceutical Conference at the Eighth Annual Meeting held at Edinburgh, August, 1871. London: J. and A. Churchill. 1871.

The appearance of the Year-Book issued by the British Pharmaceutical Conference has now become an event in the pharmaceutical year second only in interest and importance to the Meeting of the Conference itself. When, nine years ago, the first meeting of pharmacists was held at Newcastle as a kind of experiment, some doubts were expressed by many people as to the probabilities of success and permanence for the young association. But these doubts have long since vanished from the minds even of those who, at the time, entertained them, and are replaced by confidence in the prosperity of its future career. During eight consecutive summers succeeding that first gathering at Newcastle, the number of members mustering at the annual session has been steadily increasing; and we find that of names actually enrolled there are at present near upon two thousand. But the executive of the Conference are not satisfied with even this great development, and they would like to enlist into their ranks every chemist and druggist throughout the country. For the present, however, they appeal to their members to assist in electing a few new subscribers to enable them to carry on the good work in which they are interested. This handsome year-book disposes of a very large proportion of the annual income of the Conference; surely a few hundred more annual subscribers of five shillings will not be wanting when such a *quid pro quo* is offered.

The Year-Book for 1871 is in every respect a creditable performance. It does strike us, however, that in common with other similar books it has one defect, and that is, that it is too large. In this volume, exclusive of the Transactions of the Conference, there are 468 pages of large octavo. Is it possible that mere abstracts of pharmaceutical researches can, during a twelvemonth, swell to such a bulk? We are almost inclined to think, that most readers of the Year-Book would be grateful for further condensation, and on this account, if on no other, we think the Editor's *résumé* of the work of the year, which he has inserted in the form of an introduction, is likely to be more read than some other parts of the compilation. This introduction is written in Mr. Wood's usual clear style, and is well worth careful perusal; moreover, as already hinted, it possesses the strong recommendation of being short. In this retrospect, notice is first taken of Dr. Squibb's elaborate investigations into percolation, and the results obtained by that operation. Further on, in the body of the book, a full account is given of these experiments, which the editor is right in extolling highly.

The careful experiments of Mr. Barnes, described at a pharmaceutical meeting held November, 1870, are alluded to. He showed that the time necessary for the maceration of infusions may be, in all cases, reduced to one-half, and in some cases even less, without in the slightest degree reducing the strength of the resulting liquor. This result will be a source of satisfaction to many dispensers, who dislike the use of concentrated preparations. It is to be regretted, however, that in the abstract given of Mr. Barnes's paper, the error in the specific gravities, which was pointed out and corrected immediately after its appearance, is perpetuated. One of the most interesting additions to the chemistry of materia medica results from the labours of Professor Flückiger, of Bern. He has established the fact that the crystalline principles found in the different varieties of aloes are by no means identical, and has succeeded in preparing from Natal and from Zanzibar aloes two bodies which are distinct in chemical reactions from the aloin of the Barbadoes variety.

Dr. Divers has published a most elaborate investigation into the composition of the carbonates of ammonia, and has, to some extent, modified our notions respecting their composition. It seems, for instance, that the commercial carbonate of ammonia is, at the present time, different from that which has hitherto been known,—the proportion of the volatile constituent, carbamate of ammonia, having apparently increased. Many other discoveries and investigations are also shortly and concisely discussed. No retrospect of this kind would be complete without allusion to the continued and increased consumption of chloral hydrate, and the tests employed for ascertaining its quality. It seems from several papers that have been published in connection with this matter, that the latter is, on the whole, satisfactory; and, indeed, it may be looked upon as a fact creditable to manufacturers, that they have been able to overcome so successfully the difficulties attending the large production of such a peculiar substance as chloral by a reaction so complicated as it really is.

The present Year-Book is a decided improvement on the last in one respect, namely, in the more satisfactory classification of its contents.

The articles abstracted from the various journals are divided into four sections; "the first of these is devoted to information relating to substances of the animal or vegetable materia medica; the second part embraces, under the title of pharmaceutical chemistry, those papers treating of definite compounds, or referring to purely chemical processes; the third, or pharmacy section, comprises all galenical preparations; and the fourth comprehends, under the general heading of Notes and Formulæ, memoranda of subsidiary value, but which may be, nevertheless, suggestive and useful." To these four sections is added another, 'Bibliography,' which includes a notice of such books as have appeared during the year, July, 1870, to June, 1871, treating of subjects of interest to pharmacists and students. In the first three reviews is given a fairly complete exposition of the theoretical views of chemists of the present day. Those whose chemistry has become a little rusty, would find it worth while to peruse these notices.

The latter part of the volume, about a third of the whole, is devoted to the report of the proceedings of the Conference at the last annual meeting held at Edinburgh. This has passed through the hands of Professor Attfield.

Those who had not the advantage of being present at that meeting will read with interest the president's address. Mr. Stoddart has the faculty of putting what he has to say in a clear and perspicuous style; and being a practical worker himself, he throws into his account of the labours of others an enthusiasm which does much to gain for them interest and attention.

The volume is concluded and rendered complete by a good index.

Memoranda on Poisons. By the late Thomas Hawkes Tanner, M.D., F.L.S. Third Edition. London: H. Renshaw. 1872.

The present edition of this work claims to be in some respects almost a new book. The original object of the late author was to have furnished medical practitioners with a guide in cases of poisoning. Experience having shown the book to be more useful to the student than to the practitioner, it has been remodelled with a view of making it still more suitable for the former. A knowledge of the doses of poisonous drugs being an important part of the pharmaceutical student's education, this modification may perhaps help in providing for his wants. With a view of originating a somewhat more rational arrangement of the poisons, the present editor has provisionally classed them into the following groups:—

"Corrosives.—Simple Irritants, Mineral, Vegetable and Animal.—Irritant Gases.—Specific Irritants, Mineral, Vegetable and Animal.—Neurotics: subdivided into Narcotics, Anæsthetics, Inebriants, Delirants, Convulsives, Hyposthenisants, Depressants, Asphyxiants, and Abortives."

In connection with the fact that there have been several cases recorded where death has resulted from accidental poisoning by carbolic acid, we may notice that carbolic acid is not mentioned in this book as a poison.

BOOK RECEIVED.

A Treatise on the Origin, Nature and Varieties of Wine; being a Complete Manual of Viticulture and Œnology. By J. L. W. Thudichum, M.D., and August Dupré, Ph.D. London: Macmillans. 1872.

Obituary.

EDWARD ARNOLD.

The Pharmaceutical Society has lost one of its earliest members and warmest supporters by the death of Mr. Edward Arnold, of Norwich, who passed away on the 5th of January in the present year. His memory is much and deservedly respected in Norwich, where he carried on a successful business for nearly thirty years.

The writer first remembers him as chief assistant with Mr. George Stacy, who possessed a very extensive retail drug business in White Lion Street, Norwich. In 1839 Mr. Arnold left Mr. Stacy, and, marrying Miss Stacy, opened a shop on Orford Hill. There he cultivated a most successful business until 1865, when he retired into private life to enjoy the fruit of his labours. It is to be feared, however, that his very close attention to business, though securing a handsome competency, laid the foundation of Bright's Disease, which eventually caused his death.

It was certainly a marvel to those who knew him that amidst so close an attention to his daily affairs he should have found time to read so many books, and to cultivate such an interest in scientific and literary matters. His acquaintance with chemical and physical science, though not to any great extent practical, was constant and varied, so that he could enter fluently into the discussion of many subjects generally foreign to men engaged in the routine of a retail business. He had scarcely settled himself in his retirement when the fatal malady made its appearance, and his illness is one of the many warnings occurring to busy men who do not allow themselves the relaxation necessary to neutralize the strain they are obliged to undergo in their course through life.

It is always interesting to note the belongings of men who make a distinctive position for themselves in the world, and the subject of this memoir, though not perhaps widely known, could boast of a good family connection. His uncle, Dr. Joseph Arnold, of Beccles, in Suffolk, obtained some considerable celebrity as a scientific man, though dying at the comparatively early age of 37. Dr. Arnold, after manifesting considerable ability as a medical man and botanist, was chosen to accompany Sir Stamford Raffles on his appointment as Governor of Sumatra in 1817, and while accompanying the Governor in his travels to the interior of the island, discovered the enormous plant known to us as the *Rafflesia Arnoldi*, or Krúbál, described in the *Saturday Magazine* of Sept. 8, 1832. This plant possesses one of the largest flowers ever known—the dimensions being fully a yard across, and the weight fifteen pounds.

Sir Stamford Raffles, in announcing the death of Dr. Arnold, which occurred in 1818, writes as follows:—"He had endeared himself to Lady Raffles and myself by his most amiable disposition and unassuming manner. He formed part of our family, and I regret his loss as that of a sincere friend. To the best disposition he added a most cultivated mind, and in a public point of view his loss will be severely felt."

Dr. Arnold, in pursuit of his tastes as a naturalist and a man of adventure, travelled over a great part of the world, first embarking in 1808 as assistant-surgeon in the celebrated flag-ship 'Victory,' afterwards so famous in connection with Trafalgar and the death of Nelson. He subsequently made other voyages, being promoted to the post of full surgeon on board the 'Hindostan,' and his diary kept during his voyages shows his great love for natural history in all its varieties,—collecting specimens of plants, insects, fishes, rocks and fossils, in fact, anything of interest to genuine science.

Unfortunately all his interesting collection of insects and plants, together with many valuable books and drawings, were lost by the burning of the vessel in which the Doctor was stationed at Batavia.

Some years after this he accepted the appointment, already alluded to, at Sumatra, and there died.

With a natural desire to be remembered in his native town of Beccles, he left instructions for a monument to be erected in the parish church, the execution of which was entrusted to the eminent Chantrey.

But to return to the subject of our memoir, Mr. Edward Arnold, of Norwich, though suffering for a long time from an incurable disease, bore his affliction patiently and without murmuring.

Unassuming and quiet though his life was, he made a large circle of friends, who regard his loss with genuine regret. He leaves behind him no family, but his wife survives him, and cannot but keenly feel the loss of one with whom she has laboured and sympathized in all his pursuits for so many years.

SIR JAMES MURRAY, M.D.

This well-known physician died recently at the advanced age of eighty-three. For many years he performed the duties of Inspector of Anatomy for Ireland with considerable tact and ability. When Lord Anglesea was Lord Lieutenant of Ireland, Dr. Murray was his physician, and was knighted in consequence of his position, and of "eminent services" rendered to his Excellency. He was educated in Dublin, and was formerly in the army. He was ordinary Fellow of some and honorary Fellow of several learned and scientific societies. He was an able chemist, and devoted most of his time to chemical study. He published, amongst other works, essays on the 'Air-Pump,' on a 'New Method of Restoring Suspended Animation,' on 'Magnesia,' 'Specific Gravity,' 'Atomic Changes.'

It is remarkable that his contributions to materia medica and therapeutics in relation to magnesia were published upwards of sixty years ago, and that he should, a quarter of a century after, patent a "fluid magnesia," by which he obtained reputation. Sir James was of herculean frame and strength, and up to within a short time of his death maintained his wonted spirits and vigour.

MEETINGS FOR THE ENSUING WEEK.

MONDAY, Jan. 22.	*London Institution*, at 4 P.M.—"Elementary Chemistry." By Professor Odling.
TUESDAY, Jan. 23.	*Royal Institution*, at 3 P.M.—"On the Nervous and Circulating Systems." By Dr. Rutherford. *Royal Medical and Chirurgical Society*, at 8.30 P.M.
WEDNESDAY, Jan. 24.	*Society of Arts*, at 8 P.M.—"Improvements in the Process of Coining." By G. W. Dasent, D.C.L.
THURSDAY, Jan. 25.	*Royal Society*, at 8.30 P.M. *Royal Institution*, at 3 P.M.—"The Chemistry of Alkalies and Alkali Manufacture." By Professor Odling.
FRIDAY, Jan. 26.	*Royal Institution*, at 9 P.M.—"The Dæmon of Socrates." By the Archbishop of Westminster. *Quekett Club*, 8 P.M.
SATURDAY, Jan. 27.	*Royal Institution*, at 3 P.M.—"The Theatre in Shakspeare's Time." By W. B. Donne. *Royal Botanic Society*, at 3.45 P.M.

The following journals have been received:—The 'British Medical Journal,' Jan. 13; the 'Medical Times and Gazette,' Jan. 13; the 'Lancet,' Jan. 13; the 'Medical Press and Circular,' Jan. 17; 'Nature,' Jan. 13; the 'Chemical News,' Jan. 13; 'English Mechanic,' Jan. 13; 'Gardeners' Chronicle,' Jan. 13; the 'Grocer,' Jan. 13; the 'Journal of the Society of Arts,' Jan. 13; the 'Pharmacist' for November and December; the 'Canadian Pharmaceutical Journal' for January; the 'New York Druggists' Circular' for January.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Early Closing.

Sir,—I wish to add my mite to the discussion in reference to early closing, and to recommend a course that differs from all that I have seen advocated.

I have not written to the Journal before upon this matter, and do not intend to do so again, because I do not see the utility of perpetually complaining to each other. We ought to appeal to the public, who are the offenders, and then some good may be done.

I would recommend either that a society be formed amongst us for the purpose, or else that the Council of the Pharmaceutical Society be requested to prepare a manifesto to the public, pointing out the desirability of shortening our hours of work, not only in our own interest, but in theirs; nay, I would even make theirs the most prominent. Let it be judiciously shown that it is not so safe for them to apply for anything late in the evening when we are wearied and when our shops are imperfectly lighted, as it is in proper business hours; let us also tell them that it is imperatively necessary that our apprentices and assistants and ourselves have time for study out of business hours. And as to Sunday customers, whether with prescriptions to prepare or for penny articles, let us tell them that we are quite sure that not one-tenth of what we have to do on that day need be done, but that it is for them to say which are the cases of necessity.

Let some such address be sent in the first instance to all the daily papers, and afterwards have it printed in circular or handbill form and sold at cost price to all who wish to distribute it amongst their customers; and then, in a very little while, after educating the public in that manner, I feel sure that early closing would be a comparatively easy matter.

I wish here to remark that the plan recommended by some of your correspondents of organizing a strike amongst assistants is a monstrous one, as the only effect of that would be to throw the late work upon the principals and apprentices,—a result I apprehend the assistants would not like when by-and-by they became principals themselves.

I think that the present affords an excellent opportunity for making a decided stand for short hours. If mechanics, who, as a body, have no wish to study, can carry their nine hours' movement, surely we may reasonably demand from the public a limit of twelve. I believe that if we try it on, we shall get the support both of the press and the people.

Folkestone, January 13th, 1872. J. S.

Observations in Practical Pharmacy.

Sir,—The experience of any one accustomed to prepare mixtures similar to the one in question, will entirely disprove Mr. Welborn's observations on my observations. The *modus operandi* suggested is just such as would be adopted by most dispensers, precisely what I did myself some twelve or fourteen years ago, when quite a youth, with the first prescription of the kind that came into my hands; but the results have always been unsatisfactory. The ammoniacal tincture is not quite so bad to deal with as the simple, and the addition of a little mucilage helps one considerably in making a mixture that can be taken; but I hold that no additions (however simple) should be made where they can be dispensed with. I am quite open to conviction, if my statements are incorrect, but have yet to learn that they are so.

Charles Symes.

York Place, Birkenhead, January 13th, 1872.

Sir,—The interesting paper of Dr. Symes, continued in the Journal of December 30th, contains some remarks on the difficulty of dispensing a mixture of tinct. guaiaci, pot. bicarb., and sp. æther. nit. with aq. ad ℥vj. The occurrence of such a prescription is by no means rare, and there should be no difficulty in dispensing it as written.

To the powdered bicarbonate, in a mortar, add the tincture, triturating carefully; gradually add water, transferring successive portions to the bottle; lastly, add the sp. nitre, which may be diluted with more water, and fill up. In this way I have prepared a mixture literally according to the prescription quoted. It is quite satisfactory, with no appearance of resinous lumps.

Dr. Symes's difficulty seems to have arisen from ignoring the use of the mortar. With this accessory and the usual tact in proceeding "secundum artem," the desired result may be achieved whilst literally following the prescriber.

Banbury. T. Beesley, jun.

Syrup of Tolu.

Sir,—Allow me distinctly to disclaim any intention to "mislead your readers," nor do I think my remarks likely to have such an effect.

I hope always to hail with gratitude any one who is willing to add to the stock of knowledge we possess; and Mr. Haselden deserves our hearty thanks for what he has done; still I cannot entirely agree with that gentleman's proposition assuming that resinous matter suspended in water can pass the filter, or how should we obtain a clear syrup? I also adhere to the commonly received opinion that the presence of resinous matter in syrup of tolu is not liable to "induce irritation or tickling about the fauces," and instance the syrup of the United States and the Edinburgh Pharmacopœias,—the compound tincture of benzoin, tincture of tolu, pil. styracis co. (L. and E.), tannic acid lozenges and tolu lozenges, much used to allay tickling throat-cough,—all of which contain abundance of resinous matter.

The Paris Codex formula runs thus:—

"*Sirop de Baume de Tolu.*

"Baume de Tolu 125

"Eau (distillée) 500

"Faites digérer au bain-marie couvert pendant 12 heures, en agitant de temps en temps; filtrez la liqueur, ajoutez-y:

"Sucre le double de son poids.

"F. dessoudre et filtrez au papier." (No mention of cooling.)

N.B. The system of weighing proportions here adopted is the same as that proposed by Professor Redwood, and might be applied with great advantage in all operations of pharmacy.

'L'Officine de Pharmacie pratique' in commenting upon the above-mentioned process, says:—

"Les expériences de M. Deville et de M. Soubeiran ont prouvé que la dose de baume indiquée par la Codex pouvait être traitée plusieurs fois, et donner de nouveau sirop. Cependant M. Soubeiran propose d'adopter une proportion moindre de baume, et de ne le traiter qu'une seule fois." (This agrees with the experience of Mr. Haselden.)

"On a proposé de préparer le sirop de tolu en précipitant la teinture par l'eau, filtrant la liqueur pour faire le sirop." (Is the method adopted by the United States Pharmacopœia.)

"Ou encore de broyer ce baume en petite quantité avec le sucre, de faire fondre ensemble et passer," etc.

Here follows a very noteworthy remark:—

"En employant de l'eau commune il se forme du benzoate de chaux insoluble, au détriment de la qualité du sirop." Probably in this way: if the water were very hard, nearly, if not the whole of the benzoic acid would be precipitated as benzoate of lime.

R. Goodwin Mumbray.

Richmond, S.W., January 9th, 1872.

P.S. My impression was that the P. Ed. ordered tincture with syrup, and I had thus written; but, hastily referring to Pereira, mistook the initial letter at the end of one formula for the beginning of the next.—R. G. M.

"*Semper Virens.*"—The best plan is treatment with strong sulphuric acid.

"*A Duly Registered Assistant.*"—Virtue should be its own reward.

Communications, Letters, etc., have been received from Mr. L. Hooper, Mr. H. Pocklington, Mr. C. Parkinson, Mr. J. Whitfield, Mr. W. J. Tuck, Mr. J. B. Carr, Mr. W. J. Smith, Mr. G. Welborn, Mr. H. F. Bailey, Mr. H. H. Pollard, Mr. J. Harding, Dr. De Vry, Mr. W. V. Churchill, Mr. W. E. Hayland, Mr. J. R. Jackson, S. S., "Unity and Agitation," "Not an Old Chemist."

HOURS OF CLOSING.

BY R. W. GILES.

The following propositions are of the nature of axioms:—

1. "Hours of business" will be influenced by the habits of the public, and cannot be regulated solely by the choice of the trader.

2. The habits of the public vary according to their circumstances in life, and will not be similar in all localities. A difficulty is introduced by this cause, which precludes the possibility of uniformity under all circumstances without involving public inconvenience.

3. Different service may be required from different trades,—another cause of variation in hours of business. Thus, the newspaper compositor's hours of labour are the journeyman hatter's hours of repose, and "the head of the bed for Mr. Box becomes the foot of the bed for Mr. Cox."

4. Pharmacies are properly expected to be available for urgent requirements *at all hours*. (Mem.—No other trade is subject to this obligation.)

5. Pharmacies, as a matter of fact, are commonly kept open for business during longer hours than other trades in the same localities.

Question for consideration: Whether this last condition is a necessary (or even an expedient) arrangement for the fulfilment of the duties incumbent upon the pharmaceutist?

It is necessary to make careful separation between ordinary business and exceptional or emergency business. For the latter no limits can be fixed, and it can only be provided for by the constant attendance of a competent person to answer such calls whenever they occur. This, therefore, has no connection with the determination of the "hours of business."

The hours of business are (speaking generally) fixed by the tradesman upon due consideration of the habits of the people to whom he looks for custom, and the amount of rest which is needed by those engaged in the business of the shop. There are certain hours in which the street traffic is sufficiently active to find occupation for the shop, and beyond those hours it is neither profitable to the tradesman nor necessary for the public accommodation that his shop should be open.

Is there any insuperable reason why these hours should differ in a linendraper's—a stationer's—a grocer's—or a jeweller's shop—and in a chemist's? It must be acknowledged that there are points of difference. Thus the draper and the jeweller usually submit their stock to the examination of the purchaser in person, and their customers usually select daylight-hours for their calls. Chemists' orders are more frequently sent by messenger, and the dispatch of the messenger (usually a domestic servant) is often deferred until the house duties are finished. This is one reason for the lateness of chemists' business. It remains to be seen whether this is an insurmountable difficulty, or if it is one which the chemist's duty to the sick requires him to accept at the cost of the discomfort which it imposes upon himself and his establishment.

It is worthy of passing remark that different customers use different hours, and we could probably all of us attribute three-fourths of our late trade to a small percentage of customers who habitually send their orders after the housemaid has washed up the tea-things. The other fourth is probably legitimate casualty, and may be privileged as more or less emergency business. Now there seems no more reason for our hours of business being controlled by this fictitious late trade than there is for these troublesome customers accommodating their habits to our hours of business. We have to balance our own comfort against the urgency of the public want; and this involves a consideration of many circumstances.

Few chemists make any sign of closing before 8 o'clock in the evening, whereas it is a common practice for other shops to close completely (without liability to further summons) at 7 o'clock, and it does not appear that the assistants in these last-mentioned shops have more leisure than is reasonable. Masters of pharmaceutical businesses which close at 8 o'clock appear to consider that this hour affords their assistants less leisure than is reasonable, and accordingly, where it is practicable, it is customary to extend the indulgence by allowing each assistant one evening a week from an earlier hour. The advantage of the longer hours of business (if it be an advantage) is therefore not entirely secured to the master, and an inconvenient system of exceptional privileges is introduced, which every one must know is objectionable. In fact, we profess regulation hours which we find it impossible to adhere to.

More is expected from chemists' assistants than a rule of thumb acquaintance with the stock of the shop. Their duties require more intelligence, more study, and more thought than is necessary for weighing sugar or measuring calico. The risks which attend a possible mistake render those duties more exhausting to the brain, and the strain should not be at the same time greater and of longer duration. It may be said, and not without truth, that the study referred to should have been accomplished in the pupil days of the young chemist, and not taken out of time for which a price has been paid. Granting this to be so, we have still to deal with the fact that we have not yet attained to that epoch, and we know practically that our next succession of pharmaceutists must be evolved out of the assistants of to-day. How is this to be done? Doubtless a percentage of indomitable spirits will accomplish greater things than this under the most adverse circumstances; but if it was in the interest of the public (as Parliament said that it was) for pharmaceutists to give proof of a scientific knowledge of their business, it must also be in the public interest that such opportunities shall be given as will enable a sufficient number to attain that qualification, and so become fitted to take the places which, in the common order of things, the present masters must some day vacate. And I hereby record my deliberate belief that there is, under present circumstances, reason to fear that this may not happen.

We have all had occasion of late years to experience the difficulty of securing the services of assistants up to the modern standard; and we know why this has been the case. We know that many useful young men have actually quitted the trade from apprehension of examinations which they did not contemplate when they joined it. We see that numbers fail to pass the examinations when they venture to face them; and we know that many have been deterred from entering upon a vocation presenting the following peculiar inducements:—

1. A preliminary ordeal in the branches of an English and classical education.

2. The further ordeal of two examinations in the sciences allied to pharmacy and their application to it (examinations which cannot be passed without special training, for which, out of London, there is scarcely any provision, and for which, either in London or out, scarcely any opportunities are afforded).

3. Longer hours of duty than other trades exact; without full relief when the nominal hours of business are over; without the weekly rest and freedom of the blessed Sunday.

4. The smallest prospect of success which any parallel enterprise holds out.

Is it wonderful that this banner fails to attract recruits?

It used to be a popular belief, which I take to be a popular error, that the business of a chemist was a genteel trade. It ought to be, and should, with no uncertain sound, claim to be recognized as the trade of an educated gentleman; but I am bound to say, that I have often been "riled" by the insolence (I regret that no other word adequately expresses my meaning) of the public and of pretentious members of the medical profession, if they fancy they have the slightest case against the infallibility of a chemist. As I have never invited and never submitted to any such assumption, it is not to be supposed that mine is a solitary experience.

The more salient reasons for curtailing the hours of business have been thus briefly alluded to. Others may be named which, though less important, introduce some difficulties into our business arrangements.

Punctuality and regularity are essential elements of a well-conducted business. I know of nothing which has disturbed these qualities so much in my own experience as the lateness of evening hours. If young men have not been released until nine o'clock, I feel it impossible to enforce rules for being in early at night. If they are late at night, they will be unpunctual in the morning and everything is disarranged. At one time this was the greatest trouble that my business occasioned me; for there was no middle course between strict observance of rules and serious irregularities. Since then, hours have been curtailed, and I hope that punctuality has been re-established.

Late hours also cause difficulties with porters; they cannot be expected to take the same view of the specialities of the trade as the more educated assistant, who looks forward to the time when he must exact the same service from others, and they are discontented if they are kept on duty an hour later than their neighbours. A steady porter is often of as much importance in a laboratory as a good assistant, and whatever unsettles him is at least an annoyance.

I conclude, then, that we have good reasons for desiring to shorten the hours of business to such an extent as any of us contemplate. I am of opinion that twelve hours' honest work is as much as any one ought to be called upon to do for a day's hire. No doubt we all of us, as masters, have worked for longer periods, and masters will continue to do so to the end of time; but this is outside the question. So, too, will assistants find it necessary to work for their own instruction and improvement after the hours of business are over, and they must be prepared to accept with cheerfulness perhaps a larger portion of after-hours duty, besides their Sunday turns as heretofore. But in the constant harness of the shop, I do trust that we shall have the manhood and independence to secure, for them and for ourselves, a respite from unnecessarily prolonged toil.

If our shops are open through the ordinary business hours adopted by our neighbours of other trades, it seems to me that we afford the public all the accommodation that can reasonably be required of us; and I strongly recommend this rule for adoption, *i. e.* the assimilation of our hours of business to those of the most respectable firms in our several localities. We leave the public no ground for complaint, because we provide in addition for their exceptional requirements; but we, on our side, have a right to expect that their ordinary business with us shall be confined within the same limits as their total business with other trades, these limits having been fixed by custom based upon general convenience. And we have the power to enforce it!

If the public are not content with twelve hours' service, accompanied by the guarantee that all their calls of emergency will be cheerfully responded to through the hours when the night or the Sabbath gives rest to man and beast, if so be that he is not a chemist or a chemist's assistant, I think it is useless to trouble ourselves about what will content them. The public has been lately spoken of in words which I think originally hailed from Bristol, as "always poor." It is only another phase of the same idea to say that it is always exacting, and we must not expect to satisfy its cravings by concession, for all concessions, habitually rendered, are looked upon with indifference.

It would be strange if this paper, hasty as it is, should conclude without any allusion to the startling claims recently preferred for reduction of the hours of labour among mechanics. I notice them to disclaim suggestion from that movement. Our case stands upon its merits, not upon a jealous imitation of other classes' successes or excesses, whichever they may prove. I would only add, that if we have to address the public on this subject, I hope that we shall do ourselves justice by calling their attention to the fact, not necessary to dwell upon now, that our midnight attendances to their calls of real emergency have been gratuitous. Such disinterested service is surely entitled to reciprocal consideration.

Clifton.

CRYSTALLIZED ACONITINE.*

BY M. DUQUESNEL.

Nearly forty years have passed since the discovery of aconitine by Hesse in 1833, and, although it has since been the subject of several investigations by Geiger, Berthemot, Stahlschmidt, Morson and Planta, and more recently by Hottot and Liégois, Flückiger and Groves, our knowledge of it is still very unsatisfactory. The fact that, although a powerful poison, it is represented by substances extremely variable in their properties, and that the pharmaceutical preparations from the roots and leaves of the aconite plant, which owe their efficacy to the amount of this principle present in them, are sometimes very active and sometimes quite inert, has caused it to be looked upon in some quarters

* De l'Aconitine Cristallisé et des Préparations d'Aconit. Étude Chimique et Pharmacologique. Par H. Duquesnel, Pharmacien de Première Classe. Paris: Baillière et Fils.

as an unsafe, or, at least, unsatisfactory therapeutic agent. M. Duquesnel's detailed account of his search for a method of obtaining aconitine and the preparations of aconite in a more definite and uniform condition, which has already been briefly noticed in this Journal,* will, therefore, be welcomed as a valuable contribution to the literature of the subject. In this memoir the subject is treated under the following heads:—(1) History; (2) Method of Preparing Crystallized Aconitine; (3) Physical and Chemical Properties of Aconitine; (4) Chemical Reactions; (5) Salts of Aconitine; (6) Comparison of Different Aconitines; (7) Toxicology; (8) Pharmaceutical Preparations of Aconite; (9) Selection of Roots.

Although the possibility of obtaining aconitine in a crystalline state has been before demonstrated,—especially by Mr. T. B. Groves, of Weymouth, who, at the meeting of the Pharmaceutical Conference at Nottingham in 1866,† gave a process for its preparation,—it is still described in the British Pharmacopœia, and found in commerce as usually an amorphous powder. By slightly modifying and simplifying the processes previously employed, M. Duquesnel has succeeded in obtaining a crystalline alkaloid, which he believes to be the veritable active principle of the plant, and to which he proposes to give the name of crystallized aconitine. This base he thinks probably exists in combination with aconitic acid, which is very abundant in the aconite, where, combined also with lime, it forms with extractive matters, albumen, starch, fatty matters, gum, and acetic and malic acids, the constituent principles of *Aconitum Napellus*.

Preparation of Crystallized Aconitine.

The root is the part of the plant used by M. Duquesnel, as containing the largest proportion of the active principle, and to the selection of suitable roots he attaches great importance. The quantities and process adopted are as follows:—

Root of *Aconitum Napellus* . .	1000 grams.
Tartaric acid	10 ,,
Rectified Spirit	q. s.
Bicarbonate of Potash	q. s.
Ether (rectified and washed) . .	q. s.

The root reduced to a moderately fine powder is mixed with the tartaric acid, and exhausted by the cold alcohol in three successive macerations of three days each, the powder being carefully pressed after each maceration. The liquors being mixed are distilled slowly in a water bath to drive off the alcohol, the mixture being kept at as low a temperature, and as much sheltered from contact with air, as possible. The extract so obtained is cooled and treated with distilled water, which precipitates all the resinous and fat matters; the aqueous liquor filtered will then contain the aconitine in the state of acid tartrate. To this solution washed ether is added several times in such a manner as to carry off the colouring matters soluble in that menstruum and leave the aconitine salt. The tartrate of aconitine is then decomposed by slight excess of bicarbonate of potash, and the alkaloid thus set free. When the disengagement of carbonic acid ceases (indicating that all the tartrate is decomposed) it is finally agitated with washed ether, which takes up the aconitine and deposits it afterwards upon evaporation. When this evaporation takes place in a vessel in the open air, the first crystals deposited on the sides of the vessel contain traces of colouring matter and are badly formed. These are separated by decanting the ethereal solution into another vessel, where, upon the addition of about one-fourth of its volume of light petroleum (petroleum ether, sp. gr. 0·650), it soon deposits the aconitine in colourless crystals upon the sides of the vessel.

* Pharm. Journ. 3rd Ser. Vol. II. p. 226.
† Pharm. Journ. 2nd Ser. Vol. VIII. p. 122.

In order to obtain these crystals perfectly pure, they should be dissolved in water, acidulated with a little nitric or other acid, and the solution decolorized as quickly as possible with washed animal charcoal at a temperature of from 50° C. to 60°. By adding to the decolorized and filtered solution bicarbonate of potash in slight excess the aconitine is again set free, and may be obtained in isolated and distinct crystals or crystalline crusts, by treating it with ether as before.

By this process the best roots yield from three to four per thousand of aconitine. In the avoidance as much as possible of the action of heat, the replacing of the mineral acids by tartaric acid, and the alkalies by an alkaline bicarbonate, the process resembles that of Stas and that by which M. Vée has isolated physostigmatin, but differs sensibly from those hitherto employed in the extraction of the alkaloid of the aconites.

Physical and Chemical Properties of Aconitine.

The crystallized aconitine, pure and colourless, appears in regular rhombic tables, or with the sharp angles modified somewhat, and having then the aspect of hexagons. Sometimes, however, when prepared from certain varieties of the root, it crystallizes in small, short, four-sided prisms, terminated by dihedrous summits; these, however, by successive and slow crystallizations, from a mixture of alcohol and ether may be changed to the rhombic form. The difference is looked upon by the author as a purely physical one; the reactions of the two forms, distinguished by him as rhombic and prismatic, being the same.

Crystallized aconitine is anhydrous and nearly insoluble in water, even at a temperature of 100° C. When obtained by precipitation from solutions of its salts it is amorphous, pulverulent, white and very light. In this state it undergoes no apparent modification at 100° C., only losing at that temperature, and without change of aspect, its water of hydration. In the pulverulent state, especially when it has been precipitated by ammonia, it is a little more soluble in water.

As the result of some analyses made in the laboratory of the École de Pharmacie, M. Duquesnel states that the crystallized aconitine is a nitrogenized alkaloid, composed as follows:—

	1st Anal.	2nd Anal.	Mean.
C	59·967	60·180	60·10
H	7·347	7·545	7·40
N	2·580	2·692	2·60
O (difference)			29·90

Corresponding pretty closely to the centesimal proportions required for the formula—

$$C_{54}H_{40}NO_{20} \text{ or } C_{27}H_{40}NO_{10}.$$

The formula of amorphous aconitine, as given by Stahlschmidt, is—

$$C_{60}H_{47}NO_{14} \text{ or } C_{30}H_{47}NO_{7}.$$

Although these analyses show the elementary composition of the alkaloid and furnish its formula, its true chemical composition and the manner in which its elements are grouped have not yet been thoroughly studied; meanwhile, M. Duquesnel thinks that its comportment, in its own extractive liquor and in the presence of certain foreign bodies, and some of its reactions, tend to show that it is a glucoside, to which class some of the active principles of plants of the same Order (*Ranunculaceæ*) are known to belong. For instance, pure aconitine, which has no sensible effect upon Fehling's liquor, gives a very marked reaction after prolonged boiling in the presence of a dilute mineral acid. Moreover, placed in contact with a ferment, such as beer yeast, air, and a certain quantity of water, carbonic acid is disengaged, a characteristic of sugar. At present, it is not known under what influence, or in the presence of what ferment, its decomposition takes place; but it is a well-established fact, that pure aconitine, which is not rapidly decomposed even in an acid solution at 100° C., disappears quickly in the liquid extract at the same temperature. Under this hypothesis, that aconitine is a glucoside, it would be easy to explain the alterations which take place in certain pharmaceutical preparations, such as the powdered leaves, the tincture of the leaves, and especially the extract from the juice of the leaves, which loses all its active properties during its preparation.

Crystallized aconitine is inodorous, and possesses an intensely bitter taste; this bitter taste is quickly followed by a pricking and tingling sensation, developed principally on the circumference of the tongue, which is very characteristic of aconitine. It is not volatile at a temperature of 100° C., and even in the presence of boiling water it preserves its form and properties. At from 100° C. to 140° C. it is not decomposed; the crystals preserve their form, but acquire a yellow tint which deepens with elevation of the temperature. At above 140° C. the alkaloid begins to melt, taking a brown tinge; at this temperature it appears to be partially volatilized, rhombic crystals having been detected by the aid of a strong glass in the upper part of the tube used. The unvolatilized portion is decomposed into acid vapours and a carbonaceous residue that disappears entirely when heated in contact with air. Although some authors have supposed that the aconite contains an acrid volatile principle, to which it owes much of its activity, and have attributed the changes in the preparations and inconveniences met with while operating to its volatilization, M. Duquesnel agrees with M. Hottot and Mr. Groves,* in thinking that the aconite contains no such principle.

Crystallized aconitine is soluble in alcohol, ether, acetic ether, benzine, and especially chloroform, which is its best solvent. A very concentrated solution of aconitine in chloroform is precipitated by ether. It is insoluble in glycerine and the heavy and light petroleum oils. Dissolved in water acidulated by sulphuric acid, it turns a ray of polarized light to the right. Its reaction is feebly alkaline, its aqueous solution not affecting litmus paper. It is very soluble in dilute acids, forming with some of them crystallizable salts; the nitrate, hydrochlorate, and sulphocyanide being the most easily obtained. It is dissolved by carbonic acid; but the combination, if there be one, is not stable; and such a solution exposed to the air loses little by little its carbonic acid, while the aconitine being insoluble in the water forms crystalline crusts on the surface. This property may be utilized in purifying small quantities of aconitine without transforming it into a stable salt.

(*To be continued.*)

* Pharm. Journ. 2nd Ser. Vol. VIII. p. 120.

NATIVE POISONS OF INDIA.*

BY P. A. SIMPSON., M.D.,

Professor of Medical Jurisprudence, Anderson's University.

In the selection of a subject on which to address you to-night, I have been puzzled by the multiplicity rather than the dearth of the topics in which we take an equal interest. Any single drug in the British Pharmacopœia would furnish more than sufficient matter for a whole evening's discussion. It may, therefore, appear somewhat strange to you that the remarks which I propose to make to-night have reference, not to a single drug, but to a very large class of drugs, belonging to a country which is about twenty times the size of Great Britain, and of which the population is about six times more numerous. The country I allude to is India; and I would draw your attention to the drugs which are made use of there as poisons, partly because they are less generally studied in this country than they deserve to be, and partly because I have, for some years past, devoted considerable attention to the subject of poisons.

Without attempting to give an *accurately scientific definition*, the term "poison" may be said to be a general name for "all substances which, when introduced into the animal economy, either by cutaneous absorption, respiration, or the digestive canal, act in a noxious manner on the vital properties or the texture of organs." Hence we speak of "fever poison," "cholera poison," etc.

Poisons exist in the three kingdoms of nature; but those which proceed from animals are often called "venoms," such as the venom of the viper, of the scorpion, etc.; whilst those that are the products of disease have the term "virus" applied to them. In common parlance the word "poison" is restricted to deleterious articles furnished by the mineral and vegetable kingdoms. Poisons were divided by Orfila (the celebrated toxicologist) into four classes:—

1st. Acrid, irritating, corrosive or escharotic, such as the concentrated acids and alkalies; mercurial, arsenical, cupreous and antimonial compounds; cantharides, etc.

2nd. Narcotics. Those that act particularly upon the brain; as hyoscyamus, opium, etc.; but without inflaming the organ with which they come in contact.

3rd. Narcotico-acrid or acro-narcotic; those that act on the brain or spinal narrow, or both; but at the same time irritate the parts to which they are applied, as aconite, belladonna, etc.,

4th. Septic or putrescent; those furnished by the animal kingdom.

Various classifications of a similar character have, from time to time, been recommended by different toxicologists; but they are all liable to the objection that they throw substances together whose physiological action upon the system is very different. It is, indeed, difficult, if not impossible, to avoid unnatural compression of matters into places not properly belonging to them in all such arrangements.

The great majority of the poisons made use of in India belong to the classes which Orfila has termed narcotic and narcotico-acrid, and are derived from the vegetable kingdom. The abundance in which a large variety

* Read before the Glasgow Chemists' Association, Jan. 10, 1872.

of deadly plants spring up in the hot and moist atmosphere of Bengal, and the unrestricted freedom with which nearly all the most potent kinds of vegetable and mineral poisons can be purchased in every Indian bazaar, added to the familiarity with the action of narcotics which has arisen from their daily habit of opium-eating and hemp-smoking, sufficiently account for the prevalence of the crime of secret poisoning among a timid people, who, except when wrought up to a state of frantic excitement, always prefer treachery to violence in the execution of their crimes. There can be no doubt that, under the Mussulman dynasty, assassination by poison became, if not the most prevalent, undoubtedly one of the most prominent of Court atrocities. As the closing act of a great political contest, as a means of removing a stubborn minister or an intriguing kinsman, the *Datoora* (or thorn apple), with its power of gradually drowning the astutest intellect in a state of drivelling fatuity; and arsenic, which destroyed more speedily, with symptoms which the most learned native doctors could not distinguish from those of cholera (even then, one of the most prevalent diseases of India); these, I say, appear to have wrought as effectually as many of the modes of assassination in more modern times. In the old Indian records the crucial tests for discovering a poisoner are exceedingly quaint, although hardly conclusive, according to our modern ideas. We are told that "he does not answer questions, or else he gives evasive answers; he speaks nonsense; rubs the great toe along the ground and shivers; his face is discoloured; he rubs the roots of the hair with his fingers, and he tries, by every means, to leave the house. The food which is suspected should be first given to certain animals, and if they die, it is to be avoided."

Several poisons, and some harmless substances, are not unfrequently employed in India as "*philtres*" or aphrodisiacs. Indeed, the art of preparing these love-potions, and other potent mixtures for producing magical effects on mind or body, flourishes now in India as widely as ever it did among the Greeks or Romans. It is mostly practised there, as elsewhere, by jealous women, or desperate lovers of either sex, for the purpose of captivating affection, or of infatuating and enthralling the object of desire. But it is also used for baneful purposes, to cause disease, death, or some strange aberration; and, whether employed by love or by hate, it has certainly always been intimately connected with some real knowledge of medicine, and has veiled a great deal of downright poisoning. A complete and accurate list of all the vegetable poisons obtainable in the Indian bazaars, especially of those which are known to have been employed in the destruction of human life, together with full details of the operation of those the effects of which upon the system are least known, is still a great desideratum. The fact that vegetable poisons are those most frequently employed with criminal intent, is partly explained by the belief which has become general amongst native vendors of drugs, that mineral poisons can be invariably discovered, even when existing in extremely minute quantities, but that most vegetable matters cannot be distinguished by any processes of analysis known to, or practised by, European chemists. The great frequency of cases of vegetable poisoning in India induced the Government of that country, some years ago, to institute an inquiry upon this point, and the result was a return of the names of about thirty-six vegetable substances stated to be in use as poisons. Of late years the increase in the number of native dispensaries, and the importation of chemicals into India, have occasionally led to poisoning by such agents as sulphate of zinc, "Burnett's solution," prussic acid, strychnine, cyanide of potassium, chloride of cadmium, belladonna, chlorodyne, etc.; but poisoning by these substances must still be regarded as extremely exceptional, and more frequently the result of accident than of criminal intention.

Although the number of poisons made use of throughout the length and breadth of India is very great, the more popular ones (so to speak) are comparatively few, and may be tabulated thus:—

1. Preparations of arsenic Aconite Nux vomica Opium Lall chitra Oleander	for assassination and suicide.
2. Datoorah and gungah	to produce intoxication, etc., but not, perhaps, to produce death.
3. Lall chitra	for abortion.
4. Sulphate of copper Arsenic } in the Bish Boree. Snake poison	given as medicines in poisonous doses.

I propose to allude briefly to a few of these; very briefly it must be, as time will not admit of more.

First, then, as regards *arsenic*. Arsenious acids, and the yellow and red sulphides of arsenic, are imported into India in very large quantities. The principal supplies of white arsenic are brought to Calcutta from the Gulf in Arab ships, and some is also brought from Europe. The yellow arsenic comes from Oude, while another cheaper and coarser description of the yellow sulphide is imported in greater quantities from Rangoon, and passes largely into the interior of the country. Red arsenic also comes from the territories of Oude, and it is found native in China. At the present day the price of white arsenic in India is 9*d*. per lb.; of red, 1*s*. 3*d*. per lb.; of yellow (from Rangoon), 1*s*. 3*d*. per lb.; and yellow (from Oude), 2*s*. 6*d*. per lb. The returns of the custom house at Calcutta reveal the somewhat curious fact that, whereas the annual importation of arsenic of all kinds at the present time is much the same as it was fifteen years ago (viz. about 125 tons), yet during some of the intervening years the importation fell so low as 20, and even 15 tons. Arsenic is employed in India in a great variety of legitimate modes. For instance, large quantities are thrown into the holds of vessels, with the view of checking putrefaction, and the generation of animal life. Again, when wooden piles are driven into moist soil, with a view to building upon them, they are usually surrounded with a layer of arsenic. A great quantity of white arsenic is consumed in washes for the walls of houses, and for the ends of roof-beams, as a protection against white ants, bugs and other insects. The white oxide of arsenic, or arsenious acid, may be freely bought at a very low price in nearly all the Indian bazaars. A vendor has merely to say that he requires this substance as he is in the habit of eating it, or that he wants it for the purpose of poisoning rats, and it will be supplied to him in any quantity he may wish. It is very curious that this plan of procuring poison for homicidal purposes, on the plea of "killing rats," has been in vogue from the fourteenth century down to the present day, and not in this country alone, but throughout the whole of India. Thus, for instance, we read in Chaucer (fourteenth century):—

> "And forth he goth, no longer wold he tary,
> Into the town unto a potiocary,
> And praied him that he wolde sell
> Some poison that he might his ratouns kill;
> And eke there was a polcat in his heme;
> And fayn he wolde him wreken, if he might,
> Of vermine that destroied him at night."

There are various diseases in which arsenic is made use of by the natives in India. For instance, it is used indiscriminately by them in all classes and types of fever. It is used as an aphrodisiac, as an alterative in rheumatism, gout, and syphilis, and very extensively as an external application in the treatment of various skin affections.

Opium eaters in India are occasionally known to betake themselves to arsenic in lieu of their favourite drug, and it is curious that they generally suffer but little in accustoming their systems to the use of the new drug, and to the want of the old one.

The cases of poisoning by arsenic, which become the subject of investigation in India, appear to be comparatively much fewer in number than those occurring in this country. During the fifteen years between 1855 and 1870, 211 cases came before the authorities in Calcutta, in which white arsenic had been used for homicidal purposes. This is equivalent to an average of fourteen cases per annum. In England the average number of deaths from arsenic *has* been as high as ninety per annum, and at the present time it is somewhere about sixteen. It is highly probable, however, that this low average of arsenical poisoning in India by no means represents its real importance as a homicidal agent. When a native employs arsenic as a poison he usually gives his victim a quantity which would suffice to kill a dozen people, and it frequently results from this that excessive vomiting immediately occurs, and the poison is thus eliminated before it has time to be absorbed into the system. In the majority of discovered cases of arsenical poisoning in India the criminals state that their victims died of cholera. The great collapse which speedily supervenes after a large quantity of the poison has been taken, sufficiently resembles that of cholera to render the mistake in cholera seasons by no means an improbable one, when suspicion has not been aroused. Of course, a chemical examination of the vomited matters would set the question at rest by the actual discovery of the poison.

Yellow Sulphide.—The yellow sulphide, or orpiment, is but very seldom made use of as a poison, and during the last fifteen years there have been only fifteen such cases recorded in the whole of Bengal. This is, no doubt, mainly due to its colour, which would readily give rise to suspicion when mixed with articles of food. Orpiment is the preparation of arsenic which is most frequently used as a depilatory and as a pigment in India. All the bright yellow colour which Hindoos apply to their foreheads, and which they use in painting their idols, is prepared from the yellow sulphide. It is also extensively used in making paper, which, thus prepared, is secured against the attacks of white ants and all other insects.

Red Sulphide.—The red sulphide, or realgar, is also used as a depilatory, but poisoning by this substance is extremely rare.

Aconite.—Aconite is the best known, and the most frequently employed, of all the stronger vegetable poisons of India. The habitat of the plant is the temperate and subalpine ranges in the Himalayas, at an elevation of from 10 to 14,000 feet. The dried root of *A. ferox*, in common with those of other Himalayan species (viz. *A. Napellus*, *A. palmatum*, and *A. luridum*), constitutes the drug well known in the bazaars of Upper India, under the Hindustani name of Bish or Bikh. It occurs, as you know, in the form of dark tuberous roots, more or less conical, from 2 to 3 inches in length, and from half an inch to one inch in thickness at the upper end. Some specimens are white and spongy in texture, and are more powerful, the proportion of aconitia being as five to three. These roots are brittle, and break with a resinous fracture, and are readily reduced to a coarse powder. In this state they are destitute of smell, slightly bitter in taste, and produce the peculiar and well-known sense of numbness in the tongue. These roots are sold in every bazaar in India, and may be procured at about 4*s.* per lb. In medicine, the Bish is chiefly employed in India in the treatment of leprosy, fever, cholera, and rheumatism. Its "*general utility*," however, may be gathered by a description of it once given by a native doctor. He said it was "useful to sportsmen for destroying elephants and tigers; useful to the rich for putting troublesome relations out of the way; and useful to jealous husbands for the purpose of destroying faithless wives."

There is, perhaps, no other poison so much used as aconite for destroying wild animals. The apparatus employed consists of a short arrow, the head of which is plentifully smeared with the powdered root which is made into a paste with a tenacious juice. This arrow is inserted into the barrel of a musket, the head projecting externally, and the gun is discharged in the ordinary way. So fatal are its effects, that even a scratch from an arrow so poisoned is followed often by almost instant death. It is this poison that is used by all tiger-killers for poisoning their arrows.

Dose.—It is not easy to ascertain what amount of the root is necessary to destroy life; but there are cases on record where 15 grains were sufficient to produce a fatal result. But even a much less quantity than this would seem under certain circumstances to be sufficient to cause death. In one authenticated case which occurred at Darjeeling, in the Himalayas, a native, while crossing the hot valleys, allowed the aconite root—a quantity of which he was carrying across his shoulders in an open cane basket—to rub against his moist naked body. A sufficient quantity of the poison was in this way absorbed to cause death.

Period.—The period at which death takes place varies of course with the amount administered, but a poisonous dose usually proves fatal in a few hours.

Aconite belongs to that class of poisons which is termed "narcotico-acrid," and displays in its action the conjoint results of the two other classes termed "irritants" and "narcotics." The "acridity" is manifested by obstinate retching and vomiting, constant spitting of saliva, and a burning sensation in the pit of the stomach. The depressant influence of the poison renders the pulse slow, small, weak and intermittent, and gives rise to hurried laborious breathing, and a sense of emptiness in the region of the heart. The *narcotic* action of aconite is illustrated by the immediate impairment of sensibility, characterized by tingling and numbness of the lips and tongue, almost coincidently with the chewing of the root, at first acting locally upon the peripheral distribution of the nerves, but it subsequently affects the central ganglia (or nervous centres), as proved by the tingling and numbness becoming universal, and by the inability of the patient to stand upon his legs. The great peculiarity of this poison is that it leaves the mental faculties perfectly clear, even during the height of the symptoms. The patient may be quite unable to walk or stand, owing to the paralysis of the lower extremities, whilst he may be able to move his arms about without any difficulty, and to steady them in any position at will. The disordered sensibility comes on after chewing the root, and may continue more or less till the other symptoms of poisoning subside, while the patient remains perfectly rational throughout. The pupils dilate up to a certain degree only, and never reach that extreme dilatation which is characteristic of the Solanaceous group.

Test.—The chief test relied on for the detection of aconite is the physiological one; that is to say, the expert applies to his own tongue or lips a portion of the fluid suspected to contain aconite. If this poison be present, the peculiar numbness and insensibility will generally be experienced.

Treatment.—The treatment of aconite-poisoning consists chiefly in the use of emetics and the stomach pump; and although various substances have from time to time been vaunted as effectual antidotes for this poison, it is a lamentable fact that as yet none of them are deserving of the name.

(*To be continued.*)

SPECTRUM ANALYSIS APPLIED TO MEDICINE.

The following extracts from an address by Dr. Waterman, on "Spectral Analysis applied to Practical Medicine," recently delivered before the New York Academy of Medicine, possess an interest that is not confined to the medical man, but may be participated in by the chemist. We are indebted for them to the *Medical Times and Gazette*.

"One word regarding the extraordinary delicacy of the spectrum test, which far surpasses every other test previously known to us. To give you an idea of its sensitiveness, let us take one pound of common salt, and divide it into 500,000 parts. One of these minute atoms of matter is called a milligram. The experienced chemist is enabled to weigh such a minute particle only with the most delicate scales, and with extraordinary care and acquired dexterity. But with this performance he has arrived at the limits of possibilities. And now let us divide again one of these minute particles into 3,000,000 parts, and we obtain an atom of matter so minute that the human mind is unable to form any conception of it. Yet we can demonstrate its presence by the spectrum test with the utmost certainty and ease. The dusting of a book in the remotest corner of this room will immediately cause the sodium to dart forth with its brilliant yellow line, and thus reveal the presence of this metal. This delicacy of reaction is not confined to sodium. Lithium gives a reaction with a $\frac{9}{1000000}$th part of a milligram; strontium with a $\frac{6}{100000}$th part of a milligram. In the ash of a cigar, moistened with hydrochloric acid and held in a flame, we obtain simultaneously the spectra of sodium, potassium, lithium, cæsium, rubidium and calcium."

Dr. Waterman pursues the subject of the spectrum analysis of the blood at considerable length, and, after detailing some of the properties of hæmato-crystalline or hæmo-globine, goes on to say,—

"Spectrum analysis is suggestive as to the proper treatment of abnormal conditions depending upon permanent or temporary alteration of the blood-crystals. We understand now how it happens that when a man has inhaled the poisonous fire-damp he may be brought to the surface alive, may linger on for days, and yet is beyond the possibility to recover, even if he were plunged into an ocean of oxygen. Such was the condition of many of the victims of the late accident in the collieries of West Pittston. In these cases the crystallizable ingredient of the blood had been affected. We know now that the act of breathing is not a mechanical but a chemical act; that hæmato-crystalline alone possesses the marvellous capacity to attract and fix the oxygen, loosely indeed, so that it may as easily be exchanged for carbonic acid. . . . We know the strange and fatal affinity of hæmato-crystalline for carbonic oxide and other irrespirable gases, which, once attracted to it, form inseparable alliances held in deathly embrace, use up all oxygen, so necessary to the animal economy, to satisfy their own wants, as is the case when sulphuretted hydrogen is inhaled, or the deathly messenger deprives the hæmato-crystalline of its power and capacity to absorb oxygen, and to convert the hæmato-crystalline into oxyhæmato-crystalline, as is the case when carbonic oxide is inhaled; or both effects occur at once, when, for example, prussic acid has been brought into the circulation. . . .

"I have spoken of transfusion in these and other cases, where the vitality of the hæmato-crystalline has been suspended or destroyed. This operation is not free from danger. It requires proper mechanical means, not accessible to all, and neither the instruments nor the blood may be at hand when wanted. It also requires experience, which not every physician may be able to gather. In view of this, I propose to give the hæmato-crystalline internally, not alone in poisoning with gases, but also in cholera and typhus, which affect the integrity of this life-sustaining substance. Solutions of this salt may be substituted where transfusion is practised, or a small quantity may be hypodermically injected. It can now be purchased in quantity, and experiments should be instituted to test the correctness of my proposition, which is at least logically and philosophically correct. As this substance also possesses the respiratory power, it may prove superior to transfusion. Its indestructibility would secure its reaching the circulation in an unaltered condition. But, even if it should undergo a chemolytic change under the influence of the gastric juice, its only possible transmutation would be into hæmatine, which substance, in common with hæmato-crystalline, also possesses the breathing power of the blood, although, perhaps, in an inferior degree."

After describing the spectral appearances produced by hæmato-crystalline, hæmatine and cruentine, Dr. Waterman continues:—

"Being in possession of all the modifications to which blood can be brought by chemical agencies, we are now prepared to understand how this analysis can be applied to medicine. First and foremost, its adaptation to forensic medicine is to be considered. No matter in what manner *blood stains* have been tampered with, be it by maceration, boiling, acids, alkalies or alcohol, the spectroscope can tell us all about them. Where no change has been attempted, we can show the well-known blood bands; where boiling has been resorted to, we know that the hæmato-crystalline has become coagulated, and we must obtain the hæmatine tests; so, where acids and alkalies have been employed, we do well to use the cruentine reaction, with its characteristic bands. We have already adverted to the fact that hæmato-crystalline preserves its integrity almost for ever, and that we can always demonstrate it spectroscopically. You may interrupt me by claiming that a good microscope will demonstrate blood equally well. To this, however, I demur. I am no stranger to the microscope, and know, in the first place, that the defining power of the best instruments falls far below the response of the spectrum test. But it is entirely useless when blood has been acted upon by the various chemical agents above enumerated, and where the corpuscles have been disintegrated and destroyed, leaving no characteristic by which the microscope could definitely demonstrate blood.

"Spectrum analysis has thrown light upon the nature of *bile* in disease, and made us acquainted with many of its results of decomposition. Normal bile is nearly devoid of power to affect the spectrum, and this negative quality becomes a matter of great diagnostic value. . . . Satisfactory results have been obtained from spectral analysis of the *urine*. The presence of hæmato-crystalline or hæmatine is, of course, easily detected. In diseases in which an extensive destruction of blood corpuscles takes place, I have repeatedly discovered a beautiful band near F. at the commencement of the blue part of the spectrum. When this band becomes visible in the urine it indicates gravity of disease, and is a landmark to the practitioner, informing him that the vital powers of the patient are fast breaking up and passing away. . . . The spectral appearances of urine in *cholera* deserve our special notice. The early urine of patients under the influence of this terrible malady contains a peculiar principle, which, under the action of certain chemical agents, has the property of generating a blue and a red colouring-matter. These pigments give peculiar absorption-bands. The blue pigment differs in a most decided manner from the blue pigment which is derived from indican. It differs also from the blue pigment derived from bile, but bears resemblance to the alkaline alcoholic solution of hæmatine. The spectrum test may therefore be applied to diagnosticate true endemic cholera from the urine of cholera patients. We have also peculiar absorption-bands characteristic of cholera stools,—the so-called 'rice-water' dejections.

The spectrum resembles that of blood, but differs from it sufficiently so as to distinguish one from another for practical purposes. These bands are not produced by any other evacuations known, and we have therefore in them a diagnostic sign of the highest value to distinguish in doubtful cases sporadic cholera from the true Asiatic disease. The source of this pigment in cholera is probably the hæmato-crystalline, split up and morbidly eharged by the destructive chemolytic power of the cholera poison.

"The spectrum has also thrown a considerable light upon the cause of some of the symptoms in *Bright's disease*, hitherto little understood. We all know that uncontrollable retching and vomiting are often a constant symptom in chronic renal disease. This is probably produced by two new bodies, discovered by Dr. Thudichum. They are decomposition products, derived from urochrome, viz. omicholine and omicholic acid, and are formed within the economy in certain diseases of the kidney. They possess highly nauseating and emetic properties, and probably cause that uncontrollable irritation of the stomach, especially in cases where, by an irrational treatment, salutary evacuations have been repressed, and the task to relieve the system of this noxious product has been thrown upon the stomach. These bodies can be readily demonstrated by the spectrum test. Uromelanine, a decomposition product from urine, can also be easily detected. It is often coincident with melanotic disease, and points at grave disordered assimilation and imperfect decarbonization of the blood. A substance always found in connection with it is paramelanine. This is an interesting body, as it yields to the spectroscope characteristics of cruentine, thus revealing its true origin from the blood.

"Spectrum analysis has recently been employed in experiments to demonstrate minute quantities of *vegetable poisons* and their alkaloids, such as strychnine, veratrine, atropine and others. The experiments, although not completed, are promising very interesting results. Metallic poisons, such as arsenic, copper, antimony, lead, thallium and barium, can be most readily detected by bringing them into a state of incandescence, when each will show its own peculiar modification of the spectrum. Many of the tinctures and solutions of narcotic poisons give characteristic absorption bands; and by the aid of the spectroscope we can detect adulterations of wine and fermented liquors, as also the age of wines and the quality and purity of fixed and volatile oils."

NATURAL NITRIFICATION.*

BY M. BERTHELOT.

The fullest experiments that have been made on the chemical conditions of nitrification are even now those of MM. Thouvenel,† although they were made nearly a century ago. These experiments show that nitrification is principally effected upon the gaseous products of putrefaction; that it proceeds better in the presence of alkaline or earthy salts than in their absence; and that it scarcely takes place but with carbonates, and not at all with sulphates.

The results of these experiments are to be accounted for by considering that the disengagement of the ammonia furnished by the nitrogenous organic matters occurs only in an alkaline medium; that it cannot take place in one capable of forming by double decomposition only fixed and neutral salts such as the sulphate; and that, on the other hand, its occurrence is facilitated when the liquor can give rise to a volatile ammoniacal salt, like the carbonate. The presence of a fixed alkali or of an alkali carbonate determines also the generation of ammonia at the expense of the nitrogenous matters. Moreover, the presence of an alkali or of a salt with alkaline reaction is very efficacious in accelerating the oxidation of organic matters by the air at ordinary temperatures.

Even the way in which the oxidation of the ammonia proceeds, aids in explaining the efficacy of the fixed alkalies and their carbonates. For the slow oxidation of ammonia develops nitric acid, and this can only unite with the unchanged ammonia to form ammonia nitrate, a fixed salt without alkaline reaction. But the presence of an alkali carbonate preserves the alkalinity of the liquor, as it transforms the ammonia nitrate into fixed alkali nitrate and into ammonia ready for an ulterior oxidation.

A comparison of these different circumstances, with the quantities of heat disengaged by them, throws considerable light upon the degree of their participation and importance in nitrification.

Transformation of ammonia into nitric acid and into ammonium nitrate:—

Ammonia . . . $NH_3 + O_4 = NO_3H + H_2O$
Ammonia nitrate $2NH_3 + O_4 = NO_3H.NH_3 + H_2O$.

The formation of gaseous ammonia from its elements, $N + H_3 = NH_3$, disengages, according to Favre and Silbermann, 22,700 heat-units (22,500); that of dissolved ammonia, $N + H_3 = n\mathrm{Aq} = NH_3 n\mathrm{Aq}$, disengages 31,500; lastly, the formation of water, $H_2 + O = H_2O$, disengages 69,000 or 59,000, according as the water is produced in the liquid or in the gaseous state.

Hence it follows that the oxidation of ammonia disengages the following quantities of heat, according to the nature and the state of the products to which they give rise:—

(1) *Formation of Nitrogen:*

$$2NH_3 + 3O = N_2 + 3H_2O.$$

Ammonia gaseous and water gaseous . . .	177,000 — 45,000 = 132,000
Ammonia dissolved and water liquid	207,000 — 63,000 = 144,000
Ammonia gaseous and water liquid	207,000 — 45,000 = 162,000

(2) *Formation of nitric oxide:**

$$2NH_3 + 5O = N_2O_2 + 3H_2O.$$

Ammonia gaseous and water gaseous . . .	146,000
Ammonia gaseous and water liquid	176,000

(3) *Formation of nitrous acid:*

$$2NH_3 + 6O = 2NO_2H + 2H_2O.$$

Ammonia gaseous, water liquid, nitrous acid dilute	163,000

(4) *Formation of nitric acid:*

$$2NH_3 + 8O = 2NO_3H + 2H_2O.$$

Ammonia gaseous, water and nitric acid gaseous, about	162,000
Ammonia gaseous, water liquid, nitric acid dilute	217,000
Ammonia dissolved, nitric acid dilute . . .	199,000

(5) *Formation of ammonia nitrite in solution:*

$$2NH_3 + 3O = NO_2H.NH_3 + H_2O.$$

Ammonia gaseous, nitrite dissolved, about . .	104,000

The reaction of the same bodies producing water and nitrogen develops half as much more heat (162,000); ammonia nitrite also very readily decomposes into nitrogen and water.

(6) *Formation of ammonia nitrate in solution:*

$$2NH_3 + 4O = NO_3H.NH_3 + H_2O.$$

Ammonia gaseous, nitrate dissolved	131,000

* Ann. Chem. Phys. [4], xxii. 87–96; from the Journal of the Chemical Society.

† Mém. de l'Acad. des Sciences (Sav. étrang.), xi. 1787.

* Ann. Chem. Phys. [4], xxii. 75.

(7) Transformation of ammonia nitrite in solution into nitrate:—

This transformation and that of any other dissolved nitrite into a nitrate of the same base, which several authors believe occurs in nitrification, disengages about 27,000 units of heat.

These figures show that the formation of the oxygenated compounds of nitrogen by the oxidation of ammonia is always accompanied by a disengagement of heat; it can, therefore, always take place without the assistance of any external energy,—a circumstance which, in the case of certain of the oxides of nitrogen, happens only when they are formed by using free nitrogen. Hence these oxides are much more easily obtained by setting out with ammonia.

Reciprocally—but this is foreign to the question of nitrification—the formation of ammonia by the reaction of hydrogen with the different oxides of nitrogen, always disengages more heat than the same formation effected by means of free nitrogen, a fact which explains the much greater facility of the former reaction.

Various experiments to see if free ammonia could be oxidized directly by the air at ordinary temperatures, with the aid of time, have all proved unsuccessful. In spite of these negative trials, the oxidation of ammonia during nitrification cannot, apparently, be called in question; but the conditions which preside over it are still only imperfectly known.

Integral transformation of ammonia into potassium nitrate:—

The ammonia having oxidized into ammonia nitrate, this salt becomes transformed by the potassium carbonate into potassium nitrate and ammonia carbonate, with an absorption of about 3000 heat-units per equivalent of nitrate. The ammonia carbonate passes off from the solution by evaporation and diffusion, and, in an unlimited atmosphere, the ammonia separates from the carbonic acid, and becomes oxidized into ammonia nitrate under the same influences as those which have effected the first oxidation; then, by repetition of this series of changes, the whole of the ammonia becomes converted into potassium nitrate.

The transformation of ammonia nitrate into calcium or magnesium nitrate is effected by means of similar reactions, with this difference, however, that the double decompositions may take place between the ammonia nitrate and the earthy carbonates held in solution by carbonic acid. Magnesium carbonate may also be held in solution by forming a double salt with the ammonia carbonate.

Disregarding the intermediate transformations, the heat disengaged by the nitrification of ammonia into potassium nitrate—

$$2\,NH_3 + 8\,O + (CO_3K_2 + n\mathrm{Aq})$$
$$= 2\,(NO_3K + n\mathrm{Aq}) + 3\,H_2O + CO_2$$

may be directly calculated, and is found to amount to 221,000 heat-units.* This number differs very little from that corresponding to the formation of dilute nitric acid. The excess, about 4000 heat-units, represents the difference between the heat-of-combination of dilute nitric acid and that of carbonic gas with potash. It is from this again evident that natural nitrification, once provoked, can be continued under the same conditions—namely, the presence of alkaline or earthy carbonates—without the assistance of any external energy.

This assistance, however, is not wanting, for the oxidation of the organic matters, nitrogenous and non-nitrogenous, proceeds simultaneously with that of the ammonia derived from them, and adds to the quantity of heat disengaged. The fact that the presence of an alkali, free or carbonated, facilitates the absorption of oxygen by organic matter, is also explicable by thermic considerations. For the oxidation of organic matters engenders acids, the formation of which, and their simultaneous combination with the alkali, disengage more heat than would be liberated by the formation simply of the same acids in the free state. For example, the change of alcohol into potassium acetate disengages 14,000 heat-units more than its change into free acetic acid.

The disengagement of heat is further added to by the oxidation itself becoming often more profound under the influence of this additional work; such is the case with alcohol. It is necessary to raise the temperature of the alcohol considerably, to cause it by itself to absorb oxygen, and produce aldehyd and acetic acid. But by placing the alcohol in presence of an alkali, as well as of oxygen, it is oxidized gradually at ordinary temperatures, and forms, not only acetic acid, but even oxalic acid, or rather an oxalate. Now the metamorphosis of alcohol into potassium oxalate in solution disengages 164,000 heat-units more (per equivalent of alcohol) than its metamorphosis into acetate.

An analogous condition of things can be shown to be produced in nitrification, upon the hypothesis that nitrates can result from the direct oxidation of nitrogenous organic matters. It will be sufficient, to take a well-defined example, to make an approximate calculation of the heat disengaged in the nitrification of hydrocyanic acid, or rather of potassium cyanide,—a calculation of some interest in itself, on account of the frequent presence of cyanides in bricks and other nitrifiable materials.

From the equation—

$$2\,(CNK + n\mathrm{Aq}) + 10\,O$$
$$= 2\,(NO_3K + n\mathrm{Aq}) + 2\,CO_2,$$

the calculation can be made as follows:—

1st. Separation of alkaline cyanide into potash and hydrocyanic acid, all being in solution: Andrews, −7200 heat-units; Thomsen, −5600; the author's unpublished experiments, −5920; number adopted.	− 6000
2nd. Separation of the water and the acid, both liquid: From the author's experiments, for a dilute solution	− 800
3rd. Oxidation of pure and liquid hydrocyanic acid: $2\,CNH + 5\,O = 2\,CO_2 + H_2O + N_2$ From author's experiments	+ 332,000
4th. $N_2 + 5\,O = H_2O + n\mathrm{Aq} = 2\,NO_3H + n\mathrm{Aq}$.	+ 55,400
5th. Union of dilute nitric acid with dissolved potash	+ 29,600
Total heat disengaged . .	+ 410,000

This quantity refers to the nitrification of potassium cyanide, with the formation of dissolved nitre; it is nearly double that of the heat disengaged in the nitrification of ammonia at the expense of dissolved potassium carbonate; such an excess is in great part due to the oxidation of the carbon, and will probably be likewise found in the oxidation of other nitrogenous organic matters.

Gaseous hydrocyanic acid* would disengage 429,000 heat-units in furnishing two equivalents of potassium nitrate; ammonia hydrocyanide in solution† would disengage 317,000 heat-units for two equivalents of nitre formed.

All three numbers exceed that which corresponds to the oxidation of ammonia alone (221,000); it may, therefore, be accepted that nitrification must be facilitated by the simultaneous oxidation of the carbon contained in the organic substance.

* Ammonia and carbonic acid both gaseous; potassium carbonate and nitrate both in solution.

* The author has found the heat of vaporization of this acid equal to 5700 heat-units (for one equivalent).

† The author has found that the union of hydrocyanic acid with ammonia, both in solution, disengages 1600 heat-units.

THE CHICAGO COLLEGE FUND.

The following is a list of the subscriptions promised up to January 25th, 1872.

The Members of the Chicago College of Pharmacy, notwithstanding their own great losses, will themselves provide a new building. Their appeal is solely for donations of articles for the Library, Lecture-Room and Museum. English Pharmacists, unable to give books, etc., are invited to send subscriptions of money, the whole of which will be expended by the Committee in the purchase of appropriate contributions.

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The 'Chemist and Druggist' for 1869 and 1871. The 'Chemist and Druggist Almanack' for 1869, 1870, 1871, 1872.

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Several old works on Therapeutics. Mohr and Redwood's Practical Pharmacy. Thomson's Dispensatory. Gray's Supplement to the Pharmacopœia, 1821.

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Lowe, Son and Haydon, 148, Strand.

Gray's Supplement to the Pharmacopœia, Redwood.

T. N. R. Morson, Esq., London.

Opera Medica Thomæ Sydenham, cum supplemento. Antonii Musæ Brasauoli Index Refertissimus in omnes Galeni libros. Galeni Isagogici Libri, extra ordinem Classium Libri, et Galeno Ascripti Libri. Galeni Prima Classis, Naturam Corporis Humani, etc. Galeni Secunda Classis, Materiam Sanitatis; et Tertia Classis, quæcunque ad Morborum, etc. Galeni Quarta Classis, signa quibus Morbos dignoscere docet. Galeni Quinta Classis, eam Medicinæ partem, quæ ad pharmaciam spectat. Galeni Sexta Classis, eam Chirurgiæ partem amplectitur, quæ ad phlebotomiam spectat. Galeni Septima Classis, Curandi Methodum continet.

Also some Specimens of Chemicals.

The Pharmaceutical Journal.

SATURDAY, JANUARY 27, 1872.

Communications for this Journal, and books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*
Instructions from Members and Associates respecting the transmission of the Journal should be sent to ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*
Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE PHARMACY ACT AND THE SALE OF POISONS.

IN the columns devoted to legal reports this week will be found some illustrations of the difficulties that are met with in carrying out the poison regulation clauses of the Pharmacy Act. Not the least of these difficulties lies in the fact, that the magistrates and coroners, throughout the country, with comparatively few exceptions, are ignorant of the actual state of the law. A short time since, in referring to this subject, we expressed an opinion that it would be well if such officials were furnished with the information they so much require. This opinion receives additional confirmation in what is reported from Northampton, where the coroner persisted in telling the chemist that a sale of laudanum ought to have been registered, while the jury, in their verdict, with the concurrence of the coroner, said that the person supplying it, who was twenty years of age, and had passed the Preliminary examination, was too young to be entrusted with so much responsibility.

Place in contrast with this scrupulous care of the public health, which has led another public official to step beyond his proper sphere to enforce a supposed regulation which has no legal existence, what appears in the evidence concerning the recent tragedy in the Manchester workhouse. There, we are told, several nurses are entrusted with bottles containing a solution of atropia—for use when required—of the same strength as that which is supposed to have caused the deceased gentleman's death. We are not now questioning the policy or the necessity of such a proceeding; we believe it is not an uncommon one; but we think we are justified in saying that the young man in question was as likely to be capable of intelligently handling poison as an ordinary workhouse nurse.

Directly, however, the actual law is put in force the public sympathy is excited in favour of the offender, and a troublesome duty is made still more irksome by the unpleasant manner in which improper motives are attributed to the prosecutor. This was the case at Croydon, and again in the recent proceedings at Wrexham; and although in the latter case the imputations were eventually withdrawn, the editor of the local newspaper remarks, "We do not envy the position of the prosecutor as local secretary to the Pharmaceutical Society; it has the appearance of being the position of a common informant,—a duty we would much rather hand over to the police." We quite agree as to the propriety of such matters being taken in hand by a public prosecutor; but while no provision is made in that way towards enforcing the law, we think the thanks of the public are due to those who do undertake the duty.

It is a curious commentary upon the above, that the verdict at one of the inquests recorded was, that death was caused by a popular patent medicine, which two years since we were told contained nothing but sugar, alcohol, oil of aniseed and water;* at another, the verdict was death from natural causes, but the deceased had been in the habit of using a preparation which was stated by Dr. HARLEY to be "an extract of monkshood," mixed with rosewater and chloroform," the application of which was "harmless, unless the skin was broken." But no restrictions whatever are placed on the sale of such preparations, and generally the patient has no idea what he is using.

SPURIOUS TEA.

NOTWITHSTANDING the publicity given to the importation of spurious tea from China, chests of the most abominable rubbish still occasionally find their way to this country. A few days since a sample was submitted to us of a small quantity that had recently arrived and been offered for sale at three-halfpence per pound, and duty. It was composed, for the most part, of spent leaves, closely matted together in small lumps, thick pieces of twigs, immature tea fruits, pieces of straw, and dust and dirt in large quantity. It was with some satisfaction we learnt, from a respectable house, that this rubbish did not find a customer; but are we sure that it will not be offered again, and perchance fall into the hands of some unscrupulous dealer, who, by mixing it in judicious quantities with good tea, may retail it in the poorer districts of this great city at a sufficiently low price to realize a handsome profit to himself?

How much longer this kind of thing is to be allowed to go on is perhaps best known to the Government. So long as the duty imposed upon all teas, whether good or bad, is equal, and so long as the authorities take no cognizance of the quality if the duty be paid, we cannot expect much alteration in the present state of things.

HOURS OF CLOSING.

AN article with this title from the facile pen of Mr. R. W. GILES, which we recommend to the careful consideration of our readers, will be found at p. 601. He informs us that it is the result of an attempt to "methodize" his ideas on the subject

* *Medical Times and Gazette* (1870) vol. i. p. 316.

preparatory to its discussion by the Council of the Bristol Pharmaceutical Association, in compliance with the resolution passed at a recent meeting of that Society. We are glad Mr. Giles has put these thoughts on paper, and that thus the request of the Council of the Bristol Pharmaceutical Association for their publication has enabled us to give them the wider circulation which they undoubtedly deserve.

The *Pharmaceutische Zeitung* of September 23rd contains a very good description of the Kensington Food Museum, that opens with some very caustic remarks on English pharmacy. The writer says nothing makes a more disagreeable impression upon the German pharmacist than the quack-like manner in which the pharmacies are got up. In every third house of the principal streets, such as Piccadilly, Regent and Oxford Streets, the shop windows are crammed with cases, reminding one of the saddler, with porcelain and glass apparatus, tea-cans and other articles belonging to the grocer, bits of flannel to warm the back, sponges, brushes, combs, stands with cod-liver oil, all proper articles for the hairdresser. This exhibition is surpassed by the stock inside, where may be found soap and scent-bottles, bandages and sanitary linen piled up mountain high. Behind these goods the assistants rush about, of whom one house in a leading thoroughfare, it is said, keeps thirty at about £50 a year each, and two other houses about twenty each. These last two firms, with only two houses between them, pay the highest rents in London, and are recognized after dark by red lanterns similar to those of German beershops.

Just as offensive to this gentleman are the homœopathic shops, which he describes as open mostly from 10 to 12 and from 2 to 3; and the "horse pharmacies" near Tattersall's, at the windows of which the veterinary druggists exhibit aloes and veterinary medicines for horses and other animals. Warming with the discussion of the subject, he breaks out:—"Or shall I speak of the cures undertaken in the pharmacies? for pharmaceutists are physicians and surgeons, the Apothecaries' Hall diploma entitles them to it, and the medical men are pharmacists, not by law, but by sufferance; and thus one profession is in rivalry with the other." But the writer, having given vent to his indignation with the "medicinal beershops," rushes off to Kensington, where we do not propose to follow him, although his description of the Museum is highly interesting and intelligent.

From Canada we learn that the officers of the Ontario College of Pharmacy for this year are—President, Mr. B. Lyman; Vice-President, Mr. Bickle; Registrar and Secretary, Mr. H. J. Rose; Treasurer, Mr. Hodgetts.

Transactions of the Pharmaceutical Society.

Erratum.—Page 588, line 7 from bottom, *for*

Maurice, Charles Roberts........London,

read

Roberts, Maurice Charles........London.

Provincial Transactions.

MANCHESTER CHEMISTS' ASSISTANTS' ASSOCIATION.

A Meeting was held at Mitre Chambers, on Tuesday, Jan. 9th, at which a paper was read on "The Cinchona Barks," by Mr. Ridley.

After describing the various operations connected with the cutting, drying and exportation, a brief description was given of the principal barks used in the pharmacies of this country, their chemical composition, and the tests for the various alkaloids.

An interesting discussion was maintained, especially with reference to the peculiar fluorescent property of quinine when in solution.

At the next meeting, Jan. 23rd, a paper on "Carbolic Acid and the Carbolates" will be read by Mr. Carter.

NORTHAMPTON CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

The members of the above Association held a Special Meeting on January 15th, for the purpose of settling some important points connected with the working of the Association.

There were fourteen propositions brought forward, the principal being an alteration in the arrangement of the classes. Up to this time two classes had been held in an evening, and this was thought too much to carry out properly. After some discussion, and upon hearing a letter read from Mr. Yewdall, Secretary of the Leeds Association, it was decided to have one class only, from half-past eight to ten, leaving half an hour for discussion, etc.

It was decided that Bentley's 'Manual of Botany,' Attfield's 'Manual of Chemistry,' Cooke's 'Glossary of Botanic Terms,' and the Pharmacopœia should be purchased, as those in present use were borrowed. Pereira's Materia Medica was much wanted, but the state of the funds would not permit of its being obtained at present.

The next important matter related to a recent poisoning case in the town, and it was thought that it was a great pity coroners at inquests should express opinions amounting to censure on chemists who had strictly complied with the Pharmacy Act. The coroner, in this case, persisted in saying that the sale ought to have been registered, after he was told that the Pharmacy Act did not require it.

The meeting hoped that the Editor of the Pharmaceutical Journal would express his opinion on the case, as it was stated that it was not the only instance in which censure had been undeservedly passed upon chemists who had strictly acted in accordance with the law, the remarks of the coroner thus misleading the public as to the true facts of the case.

The balance-sheet was then read, showing the receipts for the year to have been £17. 19*s.* 0*d.*, the expenditure £12. 1*s.* 9*d.*, leaving a balance in hand of £7. 17*s.* 3*d.*

THE SHEFFIELD PHARMACEUTICAL AND CHEMICAL ASSOCIATION.

The Third Annual Meeting was held on Wednesday evening, January 17th, in the Rooms, Music Hall; Mr. Dobb, the President, in the chair.

The SECRETARY read the following report:—

"Your Council, in presenting the Third Annual Report, congratulate you on the Association's entering upon its fourth year.

"They regret to report unfavourably upon the past year's educational operations. This Society was originally formed to supply a want brought into existence by the passing of the Pharmacy Act, such want being an organization for providing means whereby Assistants and Apprentices might receive scientific instruction in preparing for their examinations. The valuable Library, Materia Medica Cabinets, Lectures and Classes, which have from time to time been brought before your notice, bear testimony to the Council having spared neither time nor expense to attain this object.

"Your Council have to report a great falling off in the attendance at the Latin and Chemistry Classes, the Reading Room, in the use of the Library, and a marked lukewarmness on the part of the Apprentices to avail themselves of these advantages.

"Your Council also regret the absence of the majority of the masters at the meetings of the Association; much good might be done if they would supplement their pecuniary support by personal attendance, and give encouragement to the young men in their studies.

"Your Council are happy in stating that the Association during the past year has rendered useful services. From the time when the objectionable Poison Regulations were first brought before you at a special meeting held at the Rooms, March 30th, they never ceased their watchfulness of your interests in the matter, and believe that the action taken, and the influence brought to bear by this and other Associations, were powerful in causing the 'Amended Pharmacy Act' to be withdrawn by Government. A petition, signed by seventy-two chemists, was presented to the House of Commons.

"Your Council also sent a deputation, consisting of Messrs. Wilson and Preston, to London, who rendered good service. Besides being present at the meeting at the Freemasons' Tavern, and joining the deputation which waited upon the Council of the Pharmaceutical Society and the Right Hon. W. E. Forster, they had interviews with each of the borough and county Members, and were successful in securing their co-operation. Circulars embodying our views were also sent to upwards of 200 Members of Parliament and others.

"Your Council have much pleasure in reporting that three of the students attending the Latin Class last winter session have successfully passed the Preliminary Examination.

"The attempt to form a Latin Class this session has not been successful, students generally preferring private tuition in this branch of their studies.

"The Chemical Demonstrations, conducted by A. H. Allen, Esq., F.C.S., and commenced last session, are concluded, and the Council having offered prizes for competition, three students only presented themselves for examination; two of whom, Messrs. Dunnill (Sheffield) and Birch (Chesterfield), have passed creditably, and been recommended to the Council by Mr. Allen for prizes.

"The course of Lectures upon Botany, conducted by E. Birks, Esq., and commenced last session, is now concluded. During the summer, three excursions were taken under the charge of Mr. Birks, and were of a very instructive and agreeable nature.

"The fortnightly meetings decided upon last year will be commenced this session. Two Associates have promised papers, and the Council trust the example will be followed by others.

"Your Council take this opportunity of expressing their acknowledgments to the following gentlemen, who have assisted the Association by delivering lectures during the past year. A. H. Allen, Esq., F.C.S., on 'Our Weights and Measures.' H. C. Sorby, Esq., F.R.S., F.G.S., on 'Blowpipe Chemistry.' E. Birks, Esq., on 'The British Plants of the Pharmacopœia.' H. C. Sorby, Esq., F.R.S., F.G.S., on 'The Colour of Leaves.'

"The following donations have also been received, and duly acknowledged:—Portrait of our ex-President, E. Wilson, Esq. The 'Year-book of Pharmacy,' by the Committee of the Pharmaceutical Conference. The 'Pharmaceutical Journal,' weekly, by the Council of the Pharmaceutical Society. Three samples of Rocella Weed, by Messrs. Cubley and Preston.

"Your Council, in conclusion, earnestly urge upon the members and associates, a careful consideration of the present position and future prospects of the Association.

"The income is insufficient to meet the current expenses and to supplement the fees paid by the students for the course of lessons they receive, and unless a considerable accession of both members and associates be obtained, the operations of the Association must be materially curtailed.

"No difficulty has hitherto been found in securing the gratuitous services of scientific men to deliver the monthly lectures; but the limited attendance on such occasions has been most depressing to the Council, and by no means complimentary to the lecturers.

"The rooms have been opened weekly for the convenience of members and associates, but the small attendance has manifested that it has not been considered of much use and advantage, and unless an improvement in this respect takes place, the supervision of the Council may be excused, and the expense on account of lighting, warming, etc., dispensed with.

"Early parliamentary legislation, that will most seriously affect the prospects and interests of the trade, may be most certainly anticipated; and if a successful resistance be made to the well-known restrictive policy of the medical department of the Privy Council, it can only be by the united action of Associations similar to our own, and, in carrying out this object, the *means* and the *men* must be provided.

"Your Council sincerely hope that their successors in office will, during the ensuing year, be actively supported by each member and associate taking his individual share in the responsibility of making the Association as useful and successful as its promoters have hitherto desired it should become."

The balance-sheet was read, and showed that the expenditure for the year had been £17. 4*s.* 10½*d.* in excess of the receipts, the larger portion of this deficiency being due to a subsidy of £15 in aid of the lecture fees.

Mr. DOBB proposed, Mr. LEAROYD seconded, That the Report, as now read, be approved. Carried unanimously.

The following officers were elected for the ensuing year:—*President:* Mr. W. V. Radley. *Vice-Presidents:* Mr. G. B. Cocking and Mr. H. Horncastle. *Treasurer:* Mr. W. V. Radley. *Secretary:* Mr. Job Preston. *Assistant Secretary:* Mr. G. H. Dunnill. *Auditors:* Mr. Crawshaw and Mr. Priestley. *Council:* Messrs. Ward, Cubley, Malcham, Wilson, Dobb, Hudson and Watson.

Mr. PRESTON proposed, Mr. WARD seconded, That Rule 5 shall be altered, and read as follows:—"That one secretary shall be annually elected." Carried.

Mr. COCKING proposed, Mr. WARD seconded, That a vote of condolence be sent to Mr. Watts, sympathizing with him in the loss of his son. Carried.

Cordial votes of thanks to the retiring President and each of the other officers, for their services during the past year, were passed.

To Mr. W. H. Malcham, who is retiring from ill-health, a vote of thanks was given for his valuable services during the past year as Secretary, and a vote of sympathy from the meeting, with the hope that he might soon be restored to perfect health. Proposed by Mr. COCKING, seconded by Mr. WARD.

This concluded the business of the meeting.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

Thursday, January 18th; Dr. Frankland, F.R.S., President, in the chair. At this meeting Dr. Odling exhibited some very fine specimens of rare metals and their compounds which had been lent to him by Dr. Richter and Dr. Schuchardt. Amongst these was a bar, weighing about seven ounces, of metallic indium, an element discovered a few years ago by Dr. Richter in conjunction with Reich; also some metallic rubidium. Mr. David Howard then read an interesting paper on "Quinicine and Cinchonine and their Salts." These alkaloids are prepared artificially from quinine and cinchonine respectively, by the action of heat on their salts, and are isomeric with them. Quinicine occurs along with the two last-mentioned alkaloids in cinchona bark (Peruvian bark), being apparently the one which is first formed during the growth of the cinchona plant.

SOCIETY OF ARTS.

Dyes and Dye-Stuffs other than Aniline.*

BY DR. CRACE-CALVERT, F.R.S.

Lecture IV.

Quercitron, Fustic, Persian Berries, Weld, Aloes, Turmeric, Annatto, Ilixanthine, Lakao, Tannin matters, Gall-nuts, Sumach, Divi-divi, Myrobalans, Catechu.

(*Concluded from page* 575.)

Gallic acid presents itself under the form of fine, white, silky needles, and is soluble in water, alcohol and ether. Under the influence of a temperature of 410° F., it unfolds itself into carbonic acid and a beautiful white crystalline compound, called pyrogallic acid, which has of late years been extensively employed in photography. If the temperature be raised to a higher point than the one above mentioned, gallic acid is decomposed into carbonic acid, water and gallhumic acid. The first decomposition may be represented by the formulæ—

$$\underset{\text{Gallic acid.}}{C_7H_6O_5} = \underset{\text{Carbonic acid.}}{CO_2} + \underset{\text{Pyrogallic acid.}}{C_6H_6O_3};$$

the second as—

$$\underset{\text{Gallic acid.}}{C_7H_6O_5} = \underset{\text{Carbonic acid.}}{CO_2} + \underset{\text{Water.}}{H_2O} + \underset{\text{Gallhumic acid.}}{C_6H_4O_2}.$$

Gallic acid has been produced artificially by the action of potash on a di-iodosalycilic acid. When sulphuric acid is made to act on gallic acid, it transforms it into a red acid called rufigallic, which has the formula $C_7H_4O_4$. When in contact with alkalies, or in presence of air, gallic acid, like pyrogallic and tannic acids and various other organic substances, rapidly absorbs oxygen, as was shown by M. Chevreul in 1820. On this fact, Liebig, in 1838, founded an elegant method of determining the amount of oxygen in a mixture of gases. The process is, however, only approximately correct, as I proved in 1863 that under these circumstances oxide of carbon was liberated.

Gallic acid gives a purple-black precipitate with persalts of iron, but none with the proto-salts. It gives no precipitate with gelatine, which is a most important fact, as I shall now proceed to show.

Tannin matters, such as oak-bark, are employed for tanning leather, and the conversion of a hide into leather depends on the gradual transformation of the animal matter which it contains into gelatine. This combines with the tannic acid, producing an insoluble compound which fills the pores of the animal tissue, and thus contributes, not only to prevent its putrefaction, but to render it impermeable to water. The value, therefore, of a tannin matter depends on the amount of tannic acid it contains, the gallic acid taking no part in the tanning of the hide.

Tannin substances, such as gall-nuts, sumach, or bark, contain a ferment, which is susceptible of unfolding the glucoside tannic acid into sugar and gallic acid. It is necessary, therefore, that the tanner take great care in the management of the vats, to prevent any fermentation, especially the one called ropiness, for in such a case the vat would become useless. As it is a difficult matter often in summer to prevent this state of things, I may state that I have found that the addition of a few thousandths of carbolic acid is sufficient to prevent these chemical changes, without interfering with those which must take place in the hide.

Tannin matters, as you are aware, are much employed for producing blacks on fabrics, mordanted with peroxide of iron. I asked myself some years since, whether it was the tannic or the gallic acid which produced the black, or if both participated in its production; and the results of my experiments clearly proved that tannic acid alone took part in its formation. This may be seen if two pieces of calico mordanted with iron are dipped, the one in a solution of tannic acid, and the other in a solution of gallic acid. Both pieces at first become dyed, but after a few days, the one dipped in tannic acid remains black, while in the one dyed with gallic acid the colour has disappeared, the gallic acid having reduced the peroxide of iron to the state of protoxide, which, as I have already remarked, does not produce a black with these acids.

As gallic acid is of no value to the dyer as a colour-giving principle, he must take care that his tannin matters, such as sumach, are carefully stored and kept dry, so as to avoid any gallic fermentation taking place, which would decrease the amount of tannin they contain. He should also avoid holding a large stock, as the fermentation above mentioned slowly proceeds in the tannin matters, as is proved by the fact of sumach, for example, decreasing considerably in value after it has been some time prepared.

I shall now proceed to give you a brief outline of the characteristic differences of the several tannin matters.

Gall-nuts are the most valuable and important of all tannin matters. They are produced by the female of an insect called *Cynips*, which pierces the buds on the young branches of the *Quercus infectoria*, a tree growing especially in the East. There she soon deposits her eggs, and the bud loses its natural growth, and swells out to the size of a hazel-nut, having a green, red, or pink colour. The eggs thus enclosed soon hatch, and the insect undergoes all its metamorphoses until it attains the perfect state, when, if allowed (which is not to the interest of either the gatherer or consumer), it makes a hole and escapes. Good gall-nuts should not be so pierced, and they should be heavy, and of a fresh green colour. If the insect has escaped they are yellow, and are not of nearly so good quality.

In the market, they generally bear the name of the port from which they were shipped. Thus, there are Aleppo gall-nuts, which are considered the best in the market, then the Morea, Smyrna, etc.

The following may be considered as the composition of an average sample of gall-nuts:—

Tannic acid	65·0
Gallic acid	2·0
Ellagic acid / Luteo-gallic acid	2·0
Chlorophyll and volatile oil	·7
Brown extractive matter	2·5
Gum	2·5
Starch	2·0
Lignine	10·5
Sugar, albumen, etc., and ash	1·3
Water	11·5
	100·0

* Cantor Lecture, delivered Tuesday, Feb. 28. Reprinted from the *Journal of the Society of Arts*.

Gall-nuts are employed to produce blacks on silks, in the preparation for Turkey-red, to produce fast blacks in calico-printing, and, lastly, large quantities are used in the manufacture of pyrogallic acid, the consumption of which in the present large requirements of photography must be enormous. We shall see, as we proceed, that gall-nuts are the only available tannin matter for production of this acid.

An inferior quality of gall-nut is also sold, which is found on the *Quercus robur*, which grows in Hungary, Styria, Croatia and Piedmont. It is used in those countries for tanning leather, and in some parts of Germany as a cheap substitute for the Eastern nuts.

Sumach is, as Dr. Stenhouse's researches show, the only substance in which the tannin principles are identical with those of gall-nuts, although in this tannin matter there is a comparatively large quantity of gallic acid. It also contains a soluble yellow principle.

Sumach is found in commerce as a coarse powder, obtained by the trituration of the young branches and leaves of several varieties of the family *Terebinthaceæ*. The species most cultivated is the *Rhus coriaria*, which is a plant indigenous to Italy, Sicily, France, Spain and Portugal. The shrub grows to a height of sixteen feet in the most arid soils, and is very extensively cultivated in some of those countries. The twigs and leaves are gathered once a year.

Although sumach varies greatly in the amount of tannin it contains, there can be no doubt that from the *Rhus coriaria* is the best, whilst the most inferior comes from the south of France, and is the produce of the *Coriaria myrtifolia*.

In consequence of the powdered state in which sumach is sold, it not only varies greatly in quality, but is often deliberately adulterated with sand or the leaves of other plants. It is easy to discover the sand, it being only necessary to put some of it in water, when the sand, from its greater specific gravity, readily falls to the bottom of the vessel. I will describe the method of determining the amount of tannic acid later on.

Extract of sumach is sometimes employed in print-works to produce yellows with acetate of tin, blacks and greys with iron mordants, and dark yellow with sulphate of zinc. It is also used to produce blacks on woollen fabrics, although it does not give as good blacks as gall-nuts. Its principal use, however, is to mordant, either alone or in conjunction with salts of tin, the cotton warps of the mixed fabrics so extensively manufactured in Yorkshire, by which means the cotton takes the same colours as the woollen weft, both with vegetable dye-stuffs and those derived from coal-tar.

Sumach is too expensive a tannin matter to be used for the tanning of leather, but it is employed by the currier in the preparation of skins for dyeing with light shades.

Valonia is the acorn-cup of the *Quercus Ægilops*, which grows in the isles of the Grecian Archipelago and on the coasts of Asia Minor. It is especially employed for tanning leather and adulterating garancine.

Divi-divi is the pod of the *Cæsalpinia coriaria*, and is chiefly imported from South America.

Myrobalans, which is largely used for tanning leather and producing blacks on wools, is the dried nut of the *Terminalia Chebula*, and is imported chiefly from Calcutta.

Dr. Stenhouse has shown that the tannin matter of valonia, divi-divi, myrobalans and oak-bark are not identical with those of gall-nuts and sumach. They do not yield gallic acid when boiled with dilute sulphuric acid, but sugar and some other organic principle.

From the above facts, it must be obvious to all who use tannin matters, whether dyers or tanners, that these substances not only vary in value, according to the variety of plant from which they have been obtained and the country whence they are imported, but there are sources of deterioration which cannot be detected by the eye. Thus, for example, if a new sumach be mixed with a comparatively old one, it is impossible to detect the fraud. The only method, therefore, of ascertaining the value of a sample is to determine chemically the amount of tannic acid it contains. This may be done by the following process:—A weighed quantity (say 100 grains) of the substance to be tested is boiled with distilled water, and the decoction run off into a beaker, without filtering. This process is repeated four or five times. A test solution is prepared by dissolving one drachm of gelatine in four ounces of water, and adding 15 grains of powdered alum to the solution. 155 grains of this solution represent 5 grains of pure tannic acid. The test fluid is carefully dropped into the beaker, until, on the falling of a drop upon the surface, the characteristic ring of tannate of gelatine is no longer produced. The quantity of test fluid used is then ascertained, and from this the amount of tannic acid is calculated.

Before passing from this class of tannin substances, there is one that I must mention, which has been used from the most ancient times, in Egypt, Arabia and other Eastern countries, to dye wool, horsehair, leather, etc. It is the leaves of the *Lawsonia inermis*, which appears to be the gopher wood of Scripture and the hennis of the Egyptians. The leaves are mixed with water to form a paste of an orange-brown colour. This paste also is employed by the Asiatic ladies to dye the nails of their hands and feet, as well as their ears and hair.

Catechu, *gambier* and *gum kino* are the most valuable of the tannin substances which give a green coloration with persalts of iron. They are most extensively used to produce a great number of shades, varying from light drabs to dark brown, in cheap dyed cotton goods, such as fustians and corduroys. They are used in calico printing chiefly to produce browns, in silk dyeing to weight the silk, and in tanning to produce a low class of leather, easily distinguishable from that properly tanned with bark and other matters belonging to the first class, because, when used for making shoes, it communicates to the stockings a peculiar orange-yellow hue.

For a long time there was much doubt as to the genus of plants from which catechu, gambier and kino, which resemble each other very closely in their properties, were derived. M. Guibourt, a few years ago, solved the problem. He found that real *catechu*, *cutch*, or *terra japonica* was the berry of the *Areca* palm, called *Areca catechu*, and the *Acacia catechu;* whilst gambier is extracted from the leaves of the *Uncaria Gambir*, belonging to the family *Rubiaceæ*, and kino is obtained principally from the *Butea frondosa*, a leguminous plant.

Catechu is found in commerce principally in two states, the best in lumps varying in weight from 80 to 90 lb., of a dull purple colour, and covered with leaves; the second, in masses more or less covered with sand.

Gambier is imported into this country in the form of small cubes, having a yellowish-brown colour.

Good catechu should not leave, on incineration, more than 4 or 5 per cent. of ash. Its aqueous solution should give, with alcohol or gelatine, an abundant white precipitate, with lime and baryta a brown precipitate, with salts of lead and tin a yellow precipitate varying in shade with the salts employed, and with bichromate of potash a brown precipitate. It should also take a decided brown hue with alkalies, and assume a greenish colour with salts of iron.

Catechu, besides naturally varying widely in quality, is freely adulterated with mineral substances, starch, tannin matters and blood.

I have just stated the amount of ash a good catechu should yield. To ascertain the presence of starch, the sample should be first treated with alcohol, and the insoluble residue boiled with water, which will give a fine blue coloration on the addition of iodine if starch be present. The presence of any ordinary tannin matter in the catechu will modify the green coloration which the latter substance gives with the persalts of iron. Blood may be detected, if present, by treating the catechu with alcohol, and, after drying the insoluble residue, heating it in a tube, when ammoniacal vapours will be given off, as well as vapours of a most offensive odour.

Catechu is composed of three distinct substances, first, a tannin matter called *mimo-tannic acid;* second, *catechine*, or *catechinic acid;* and lastly, a brown colouring matter due to the oxidation of the catechine.

Mimo-tannic acid is prepared by treating pulverized catechu by ether in a displacement apparatus. The ethereal solution leaves on evaporation a yellow porous mass of this acid. Bombay catechu yields about 55·5 per cent. of mimo-tannic acid; that from Bengal, 48·2 per cent.; while gambier yields from 36 to 40 per cent.

Catechine, or *catechinic acid*, is obtained by treating with boiling water the residue from catechu, which has yielded its mimo-tannic acid to ether. The water, on cooling, deposits a brown crystalline precipitate, which is redissolved in water, treated with subacetate of lead, and the precipitate washed. The lead compound is then suspended in water, and decomposed by sulphuretted hydrogen, when pure catechine remains in solution. Its formula is $C_{10}H_{10}O_4$. It rapidly becomes coloured brown in the presence of air and an alkali, being, it is said, converted into *japonic acid*, whilst with alkaline carbonates it yields *rubinic acid*. It is also converted into japonic acid under the oxidizing influence of salts of copper and of bichromate of potash.

If dyers, instead of employing catechu as imported, were to grind it, and wash with cold water, they would obtain an extract which would yield very pure shades of green drabs, while the insoluble residue of catechine would give a great variety of shades of brown. To increase the permanency of catechine colours, the goods dyed with them should be passed through a solution of bichromate of potash, as is usually done for catechu browns.

Dr. Stenhouse has shown that the tannin matters giving a green coloration with persalts of iron, such as catechu and elder and larch barks, do not contain a glucoside. The only exception he has found to this rule is willow bark.

Parliamentary and Law Proceedings.

Infringement of the Pharmacy Act.

At the Wrexham Borough Magistrates' Court, on Monday, January 15th, Mr. John Davis, druggist, Yorke Street, appeared in answer to a summons charging him that he "did unlawfully sell by retail one certain poison contained in one wrapper or cover, and containing a certain poison, being a preparation of mercury, called red oxide of mercury, or red precipitate, without the said wrapper or cover being distinctly labelled with the name and address of the seller of the poison, and the contents of the said wrapper or cover then and there not being medicine supplied by a legally qualified apothecary to his patient, nor any article forming part of the ingredients supplied in medicine dispensed by a person registered according to law." A second information charged the defendant with selling syrup of poppies without the bottle being distinctly labelled with the word poison, and with the name and address of the seller.

Mr. T. Bury prosecuted, having been instructed by Mr. J. F. Edisbury, Local Secretary of the Pharmaceutical Society.

Mr. Bury said the defendant was charged with an offence under the Pharmacy Act of 1868, which was passed to regulate sale of poisons, so that a person selling any without labelling it with the name of the article and the name and address of the seller was liable to a penalty, for the first offence not exceeding £5. The Pharmaceutical Society from time to time passed resolutions defining what were poisons, which resolutions were forwarded to the Privy Council for approval and advertised in the London *Gazette*. The object in laying the present information was simply for the protection of the public. It had become necessary and expedient in the opinion of the Legislature that the sale of poisons should be placed under certain stringent regulations, in order that in any case of poisoning, for instance, the poison might be traced to the seller; and also that the strength might be known. It was necessary that the public should know that there was such an Act as the Pharmacy Act in existence, for at present the people seemed rather to have been led into the belief that the existing Acts relating to the sale of poisons were simply useless. He then referred to a letter that had appeared in a local newspaper, ridiculing the poison clauses of the Pharmacy Act. John Williams, an errand boy, was sent—on the Wednesday night before Christmas—to the shop of the defendant for a pennyworth of red precipitate, which was served to him with the word "poison" on it, but not the name and address of the seller, and he also got half an ounce of syrup of poppies without the word "poison" or the name and address of the seller. He (Mr. Bury) would put in the *Gazette* of the 21st of December, 1869, in which the resolution of the Pharmaceutical Society for making red precipitate a poison appeared, which was the same article supplied by the defendant.

In reply to the clerk, the defendant did not admit the offence.

J. Williams said: I live in Penybryn, and I am an errand boy in the employ of Mr. Edisbury. On the Wednesday before Christmas Day, about seven o'clock at night, I was sent to the defendant's shop, in Yorke Street, and he was in the shop. I asked him for a pennyworth of red precipitate, which he gave to me. He gave me the packet now produced. He did not say anything to me about it, and I saw him put the label upon the packet as it is now, and it is in the same condition in which it was when handed to me. I took the packet to Mr. Edisbury.

The defendant cross-examined the witness as to the number of times he had been sent to make purchases, and as to the package being in the same state now as when he received it, saying that witness had been trying to entrap him, under the superintendence of Mr. Edisbury.

Mr. Bury complained that defendant had made such an imputation, and asked how Mr. Edisbury was to perform his duty as secretary to the Pharmaceutical Society without bringing forward these cases? There was no feeling or animus in the matter.

Defendant: Are you sure you have not?

Mr. Bury: I am sure we have not. Mr. Edisbury is the local secretary to the Society, and he is bringing these cases before the public.

Defendant said he did not deny having sent the poison out without a label.

Mr. Bury: You insinuated that the labels had been tampered with.

The defendant said he did not wish to insinuate anything of the kind. It was unusual for him to sell anything like red precipitate without a wrapper round it stating its contents. He really had no intention to sell any poison without his name attached. He had been in business thirty years, and he had not killed any one—[a pause]—to his knowledge. He had been very cautious, and he hardly ever gave poison to a young man like the witness without questioning him. This was the first time he had been before either a coroner or a justice of the peace.

Mr. Charles Hughes (a magistrate) said the Act had only been in operation about three years, and it was for the protection not merely of the public, but of the defendant's profession,—it involved such stringency that people would not like to enter such a business, surrounded by so many peculiar cautions; but the defendant, having been in business thirty years, ought to be peculiarly fitted to conduct that business.

Defendant said he was not aware even that he was bound to put his name on the label.

The Bench retired, and on the magistrates resuming their seats, Mr. Hughes said the justices had very carefully considered this case, and their decision was that the defendant should pay £1, including costs, and the reason of the Bench for inflicting such a mitigated penalty was, that the word "poison" appeared to have been on the label, although not the name and address. This would be a sufficient warning to the defendant and to other persons who were not sufficiently acquainted with the Act. If any other case came forward, it would be dealt with far more severely.

Mr. Bury withdrew the second information, now the defendant had expressed that he did not intend to cast any imputations on Mr. Edisbury.

The Disputed Claim at Shrewsbury.

Andrews *v.* Davies.

This case, it will be remembered, came before the Shrewsbury County Court, and was adjourned to enable the plaintiff to amend his bill. He now sued for certain articles supplied as a chemist and druggist.

Mr. Chandler, for the defence, said his client was freed from payment of the bill by the Medical Act.

Mr. Andrews, the plaintiff, was then examined. He said: This bill is for medicines supplied on the dates stated in the account. The defendant was then ill, and these medicines were supplied to him. The charges are the usual trade charges.

Mr. Chandler: If I read this bill rightly, it contains something else besides charges for medicines. There are some portions of it in which you make no charge?

Plaintiff: Yes.

Mr. Chandler: Where is your diploma?

Mr. Morris, for the plaintiff, objected to this question.

The Judge: How are you entitled to ask for his diploma? Here is a bill as a chemist and druggist. He claims, not as Thomas Andrews, M.D., but as Thomas Andrews, chemist and druggist, and he charges for no more than for what a chemist and druggist would be entitled to charge. Although there are some other things in the bill, he puts no charge to them. Does the mere fact that he entered these things in the bill, and that he entered some other service rendered to the defendant, although he has not charged for more than supplying the medicines,—for he does not make any charge for services,—make it a medical man's bill, or entitle you to ask for his diploma?

Mr. Chandler: No, it does not; but I will postpone asking for the diploma. (To plaintiff.) When did you prescribe these medicines?

Plaintiff: At the time.

Mr. Chandler: You did prescribe them, then? When did you compound them?

Plaintiff: Perhaps one day, and he called for them the next, when the medicine was ready. He generally called in and said, "I shall want another bottle of medicine," and it was got ready for him.

Mr. Chandler: You prescribed them one day, and compounded them another?

Plaintiff: Yes.

The Judge: What I take to be the law is this,—a chemist and druggist may prepare and dispense medicines, but he cannot give advice. I infer that, although he may make up and dispense medicines, he cannot prescribe medicines. Prescribing is not dispensing.

Mr. Chandler: He has admitted that he prescribed them the day before he dispensed them.

The Judge (after referring to the Act): I imagined the moment he said he had prescribed this medicine he was out of court.

Mr. Morris: But I will show that all these medicines were sold in the ordinary way. There is no difference between these charges and the charges of a chemist or apothecary. In point of fact, these charges are those of a chemist and druggist.

The Judge: Whatever these charges are, he has put himself on the footing of a medical man. When a chemist takes upon himself to prescribe, he invades the province of a medical practitioner, and plaintiff has said that he prescribed them.

Mr. Morris: But a man may come into a shop and order a bottle of sarsaparilla.

The Judge: That may be; but if the doctor, or would-be doctor, prescribes it, it is fatal to his recovering for it. There is a difference between supplying it and prescribing it.

Mr. Morris: Then do I understand your Honour that it is no use going on with the case?

The Judge: Not the least.

Mr. Morris: Although the plaintiff has been in another court, he thinks he has a right to sue in this court, as a chemist and druggist, for drugs supplied in the ordinary way of his trade as a chemist.

The Judge: He has vitiated all claim to what he has supplied, in consequence of his having prescribed them. Judgment is for the defendant with costs.

Mr. Chandler: I did not ask for any costs before, and I do not ask for them now.

Alleged Poisoning of a Medical Officer.

On Thursday morning, January 18, Hannah Steele was brought up on remand at the Manchester City Police Court on the charge of having caused the death, by poison, of Mr. Andrew Harris.* The following evidence was given in addition to that printed last week.

Dr. Crace Calvert said: I have analysed the contents of one bottle that has been handed to me by Inspector Henderson. It is a small, white bottle, labelled "Found on the mantelpiece in Mr. Harris's room, on the 10th January, 1872." I have completed my analysis. It contains atropia, which is a vegetable poison found in what is called *Atropa Belladonna*, or deadly nightshade. It is a deadly poison, and a very small quantity would produce death. It may be useful to the Court to know that I sent to the workhouse for the solution that is usually employed at the workhouse, and I have compared it with the one which was found in Mr. Harris's room. Both of the solutions are identical. Tea would have a tendency to separate the poison, but with milk it would mix. I have not completed my examination of the blood, urine, etc.

Margaret Lythgoe was asked whether she had not said that she had seen drugs poured from one bottle to another in Mr. Harris's room over the tea things, to avoid soiling the cloth. This she denied. She had never seen drugs mixed in the room. Some drugs were kept in the room in a small medicine chest on the mantelpiece. She did ask Mr. Harris while he was ill, whether he thought Mr. Patchett might have been mixing drugs that morning and accidentally poisoned the milk, but he said he did not think so.

Evidence was given that Mrs. Steele was seen to go into Mr. Harris's room about half-past eight on the morning in question.

Mr. Patchett, the assistant-surgeon, repeated his former evidence, and in addition stated, that the deceased said to him that while he was washing in his bedroom he heard somebody in the sitting-room. He opened the door and saw Mrs. Steel in the room. Deceased pointed to a phial on the mantelpiece, and said that he found it there that morning, but that it had not been there the previous evening. He also said that the liquid in the bottle smelt like the milk.

* See *ante*, p. 596.

Witness continued: The poison is used in ophthalmic cases. The nurses apply it. It would have to be got from the surgery. The nurses know it is a deadly poison; it is always labelled. I have been in the habit of going into Mr. Harris's room every morning; but I do not remember ever seeing bottles of poisons lying about. There is, however, a case in his room containing four blue bottles. I do not know of any purpose to account for the bottle in Mr. Harris's room being there. When he pointed it out to me I took possession of it, and had it sealed.

J. W. Guillmette said: I am dispenser and surgeon's assistant at the Manchester Workhouse Hospital. I supplied Professor Calvert with the bottle of atropine taken out of the dispensary. Some of the nurses have been supplied with the poison in phials. I inform them it is a deadly poison. The paupers had no means of getting the poison. The nurses did not always return the phials, although I tell them to do.

Mr. Headlam (a magistrate): Do you keep a record as to whom you give poisons?

Witness: Yes, in my private notebook.

Mr. Headlam: If you had supplied poison to Mrs. Steele, would you have a record of it?

Witness: Most undoubtedly.

Mr. Cobbett (on behalf of the prisoner): Is it a fact that several nurses have been found with atropine bottles upon them?

Witness: Yes.

After some further evidence the inquiry was adjourned for a week.

Suicide by taking Laudanum.—Censure of a Chemist by a Coroner.

An inquest was held at Northampton on Monday, Jan. 1, before Thomas Green, Esq., deputy-coroner, on the body of Elizabeth Lewin, who had died the previous day from the effects of laudanum. Evidence having been given as to the circumstances connected with the death—

Edmund Herbert Cooke was examined, and said: I am an apprentice at Mr. Jeyes's, chemist. I saw deceased on Saturday evening, about half-past nine o'clock, when she asked for some laudanum, and I supplied her with only two-pennyworth. I had never seen her before to my knowledge. I recognized the bottle when the police brought it to me. I had not served any laudanum before on that day. I labelled the bottle "poison," and the name and address of Mr. Jeyes. I did not enter the name in a book.

The Coroner: *You are bound to enter the names and addresses of the customers in a book, with their signatures.*

Witness continued: The woman seemed well enough. She appeared as if she had been drinking slightly. She said she wanted opium to mix with pills. She took a pennyworth of rhubarb for making pills. I do not generally supply people with poison who look as if they were in the habit of drinking.

Mr. W. M'Kinnell, chemist, deposed: The deceased was known to me only as a customer. I knew she lived in Cow Lane, but did not know her name. She called upon me about ten minutes after nine on Saturday night, and wanted four-pennyworth of laudanum. She always appeared when in my shop in a maudlin state of drunkenness. I told her she must come again another day, as I could not let her have any then. She had not had laudanum from me at any time before.

The jury returned a verdict of "Accidental death," and, in doing so, expressed their opinion that it was wrong for so young a man as the witness Cooke to be allowed to serve poisons.

The Deputy-Coroner entirely agreed with the jury.

[*** We are informed that the witness Cooke is twenty years of age, and has passed the Preliminary examination.—Ed. Pharm. Journ.]

Death from a Patent Medicine.

An inquest has been held in the Cambridge Barracks, Portsmouth, before Mr. W. H. Garrington, on the body of Rose Ann Moore, aged fifteen months, the daughter of a colour-sergeant of the 88th regiment. The child had been ill with whooping cough, and two doses of "Mrs. Winslow's Soothing Syrup" were given to her, after which she went to sleep for an hour. On awaking the child's appearance was alarming, and she was taken to the residence of Dr. Heath, the assistant-surgeon of the regiment, who found the deceased suffering from the effects of a narcotic. Death took place the same evening.

Dr. Heath said he had no doubt the syrup, which was much used by the public, contained some narcotic ingredients, but what he could not tell. He was of opinion that from the symptoms during life, and the results of the *post-mortem* examination, death was caused by narcotism, produced by the two doses of syrup. The jury returned a verdict accordingly.

Sudden Death of the Hon. G. C. Vernon.

On Saturday afternoon Dr. Lankester, the coroner for the central division of the county of Middlesex, held an inquest at 37, Montagu Square, on the body of the Hon. Gowran Charles Vernon, the Recorder of Lincoln and second son of Lord Lyvedon.

The coroner, in opening the case, remarked that, in accordance with the wishes of the Middlesex magistrates, he had determined not to hold a *post-mortem* examination. In his opinion it was perfectly unnecessary; but if the jury, after hearing the evidence, were still unsatisfied, then he would issue the requisite order.

The Hon. Greville Richard Vernon, of Kilmarnock, stated that he was the brother of the deceased, who was forty-seven years of age, and was Recorder of Lincoln. For some time past he had complained of pains in his head; he had consulted several medical gentlemen, and had never left his home without being accompanied by Mrs. Vernon. He was in the habit of using "neuraline," a patent medicine, to soothe the pains in his head. On Monday, the 15th inst., he went out for a walk with his wife, and on his return he was seized with a fit. Drs. Watton, Comberbach and Williams were sent for, and attended him in the drawing-room. They determined that he was suffering from neuralgia and epileptic fits. He had complained of severe pains in his head, and had used "neuraline," with which he painted his face with a camel's-hair brush, purchased from Leath and Co., St. Paul's Churchyard.

Mr. Arthur Wynn Williams deposed that he was called on Monday last, and found the deceased lying in bed. His features were perfectly placid. He had been in the habit of using "neuraline," the application of which was harmless unless the skin was broken.

Mr. George Harley, M.D., M.R.C.S., formerly physician to the University College Hospital, stated that he made an analysis of the contents of the bottle marked "neuraline." It was an extract of monkshood,—called by botanists "aconite," the active poison of which is "aconitine,"—mixed with rose water, and contained chloroform; one drop and a half of Fleming's tincture being sufficient (in half a bottle) to destroy life.

Dr. Watton stated that he declined to give a certificate of death, in consequence of its suddenness.

The coroner remarked, that owing to communications he had received he had determined, notwithstanding the deceased was attended by four medical men, to hold the inquiry. He had read letters from Lord Rokeby and others, and there was no doubt that the deceased had expired from natural causes. In deference to the feelings of the friends, he held the inquiry at the residence of the deceased. There was no doubt he was seized with a fit of convulsions, from the effects of which he expired. The jury returned a verdict of "Death from Natural Causes."—*Times.*

Reviews.

THE POCKET FORMULARY, AND SYNOPSIS OF THE BRITISH AND FOREIGN PHARMACOPŒIAS. By HENRY BEASLEY. Ninth Edition, including the Formulæ of the British Pharmacopœia, 1867, etc. etc. 1872. Pp. 547.

The new edition of this handy counter companion to the dispensing chemist completes the list of practical pharmaceutical handbooks, the publication of which has been rendered necessary by the issue of the British Pharmacopœia of 1867.

The Editor, in preparing this edition for the press, has availed himself of all the most recent publications bearing on his work, and has included most of the new remedies of permanent value. He gives us, in *one* handy volume, the formulæ and processes contained in the last British Pharmacopœia, in Squire's 'Companion' and the Pharmacopœias of the different London hospitals, besides a copious selection from foreign Pharmacopœias and formularies.

So far as we have been able to test the formulæ by reference to original sources, this edition appears to surpass all that have preceded it in accuracy, condensation and perspicuity; and we most cordially recommend every member of the trade to protect himself against possible mistakes on the part of his assistants or apprentices by burning or hiding all the previous editions in his possession, and substituting for them the particular *one* to which we now direct the attention of our readers.

ST. GEORGE'S HOSPITAL REPORTS. Edited by JOHN W. OGLE, M.D., and TIMOTHY HOLMES, F.R.C.S. Vol. V. London: Churchill.

This volume is less rich in matter of purely pharmaceutical interest than its predecessors; but we notice it as one of a series in which all who are concerned, directly or remotely, in the art of healing will find instruction and rational entertainment. The names of its editors—the one a distinguished graduate of the University of Oxford, the other an equally distinguished graduate of the University of Cambridge—are guarantees for the correctness and even finish of style which will be found in its contributors. Another laudable feature of the volume—distinguishing it from similar publications (like that of Guy's for example)—is its selection of articles not from members of the hospital staff merely, but from all who have been students of St. George's, thus giving to the *ensemble* a completeness and a variety which can only be got by relieving the purely scientific matter with that obtained from the outlying field of general practice.

Dr. Clifford Allbutt's paper on the "Effects of Overwork and Strain," is of interest for all professional men in these days of high pressure competition and general "haste to be rich"; while the very elaborate contribution on the "Relative Influence of Bread, Honey and Sugar upon the amount of Urea and Sugar excreted in Diabetes" has much to attract those of our readers who devote themselves to physiological chemistry and the action of remedies. The annual reports of cases are carefully compiled; the most effective, at least in the eyes of lay readers, being that on the ophthalmic department, by Mr. Brudenell Carter, who is known beyond the profession for high proficiency as a specialist and as a writer of varied accomplishments. The entertaining article of the volume is that of Mr. W. Ewart, on a "German Feld-Lazareth," the perusal of which will beguile one of those winter evenings, which remind us of the terrible sufferings endured on the field and mitigated in the ambulance a twelvemonth ago.

Altogether, the present volume reflects much credit on the past and present working of St. George's,—the engravings being, perhaps, the only point in which we can desiderate improvement.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

PHARMACEUTICAL EXAMINATION.

Sir,—I have just read your lengthy report of Mr. L. Siebold's lecture at Manchester, and am sorry that it has been thought worthy to be reported *in extenso*. I cannot but believe that it is likely to do an immense amount of harm, and is calculated to engender unpleasant feelings between students and "the powers that be." In my opinion that lecture abounds with absurdities and inaccuracies, and is calculated to reflect no little discredit (not to say disgrace) on both examiners and examined.

Mr. S. is, I believe, "a teacher of Pharmacy," and seems to complain that so many candidates are "plucked." I cannot help contrasting his remarks with those made by another Professor a short time ago,—Dr. Attfield, of London, who says that, as a rule, he does not admit the possibility of his candidates being rejected. Mr. S.'s remarks on this subject, then, reflect more on the teacher than the pupil; since these contrary statements cannot be reconciled but on the ground that the London candidates are better prepared than the Manchester ones!

With regard to the order of reading recommended by Mr. S., I would not advise any one to follow it, as I feel confident that reading by snatches of a day or two at subjects alternately, must inevitably end in confusion of thought, and hence failure when the time for testing one's knowledge comes.

As to botany, Mr. S. seems to think the study of this science entirely unnecessary, and that it is irksome and uncalled for in practice. I would simply ask him how his non-botanical student would understand one-half the definitions of materia medica in the B. P. Take the description of Fol. Buchu; who, without some knowledge of botany, would understand anything about "pellucid dots" or "indentations"? This is a simple illustration, but similar ones occur on almost every page of the work mentioned. I say nothing about the imperative necessity that a professional man should be possessed of such elementary knowledge as the distinctions between a corm and bulb, etc.

I, for one, should be very sorry to see our Minor so degraded as to require only what could not be done without; and I further maintain that the knowledge required by the Major is something more than merely useful in business.

Mr. S. assumes that we all know "that able and well-qualified men fail, and others quite incompetent succeed." I, for one, very gravely doubt the truth of this assertion, and I consider it almost impossible that such an accident can happen with the machinery we have in force at Bloomsbury Square. My personal experience of the examinations is not of the smallest, and the information I repeatedly receive from both successful and rejected candidates entirely establishes my own opinion. The Board of Examiners are, as a rule, courteous and gentlemanly, and the examinations are conducted in such a manner that each candidate has the fairest and fullest chance of success.

As to Mr. S.'s remarks on practical pharmacy, they are on the face of them so absurd as to be almost beneath one's notice. He seems to ignore the B.P. altogether,—the book of all books, which the student should have the most knowledge of.

In conclusion, I would recommend any intending candidate, instead of being misled by the lecturer into finding fault with the subjects, to go carefully through the synopsis published by the Society, and fairly read up each department as there set forth; and this done, I would say, "your success is certain."

I would just add that the Chairman of the meeting displayed some ignorance of the Pharmacy Act, as in section 16, it is distinctly stated that any executor or trustee may continue the business of a deceased chemist under the management of a qualified man.

BENJAMIN KEEN.

Uppingham, January 23rd, 1872.

Syrup of Tolu and Cinnamic Acid.

Sir,—Mr. Mumbray is clearly in the wrong groove. If he will kindly turn to the Pharmaceutical Journal, 3rd series, No. 70, p. 467, lines 2 and 21 from the top, second column, he will see at once that it was the mixture of cinnamic and benzoic acid which is to be separated by filtration from the cold liquid before being added to the sugar; that to these crystals, suspended in the syrup, is imputed the probability of exciting irritation; the resin falls to the bottom of the vessel in which it is boiled with the water, the small light particles floating on the surface, but for the acid, could be separated either hot or cold by ordinary straining through muslin or otherwise. The noteworthy remark from 'L'Officine de Pharmacie pratique' is a misconception; for if by the use of common water (which should not be used), containing sufficient lime in it, benzoate of lime were formed, it would remain in solution, and it would be necessary to evaporate the solution to obtain the crystals; whereas, if cinnamate of lime were produced, and which would be the expected and natural result, this cinnamate of lime would crystallize out upon cooling, and be readily separated by filtration, and from it pure cinnamic acid might be obtained; whilst the benzoate of lime would remain in solution in the mother-liquor, this being, in fact, the distinguishing test between the two. With respect to the lozenges mentioned, I could say much about them and the state of the ingredients in them, but it would be occupying space needlessly, and I feel that quite sufficient ventilation has been accorded to this subject.

A. F. Haselden.

18, *Conduit Street*, 22*nd January*, 1872.

Observations on Practical Pharmacy.

Sir,—From correspondence in the Journal, I see that Mr. Charles Symes and Mr. G. Welborn have observed different and somewhat contradictory results in dispensing a mixture containing tinct. guaiaci. With the former gentleman, the resin "will deposit in lumps;" while the latter is able to suspend it in a finely divided condition.

I am convinced, from my experience, that the difference is not at all, or at least not so much, owing to varied manipulation as to the condition and age of the tincture.

When freshly made, tinct. guaiaci will emulsify readily, but, when long kept, the result obtained by Mr. Symes is almost sure to be observed.

John Whitfield, F.C.S.

Scarborough, January 13*th*, 1872.

Benevolent Fund.

Sir,—I read with some interest a letter in your Journal, written by Mr. Stevenson, of Ripon, with reference to the Benevolent Fund.

I have not one word to say as regards the proposition for increasing the resources of that fund, or as to the means advocated for so doing.

My present purpose is to elicit information which will be useful to myself and, may be, to others.

Mr. Stevenson says there is not one subscriber to this fund in the city of York. Now, when I became a member of the Pharmaceutical Society and paid two guineas entrance fee and one guinea annual subscription, I certainly did so with the idea that I was, to some extent, supporting the Benevolent Fund, as well as other institutions in connection with the Society.

This view of the case was all the more confirmed to my mind, by the fact of each member being allowed two votes.

I shall, therefore, be glad to know the truth of the case, as my action for the future will very much depend upon your reply.

In my endeavours to persuade others to join the Pharmaceutical Society, I have always dwelt upon the claims of the Benevolent Fund as an inducement; but this was because I really believed that it was an efficient means of helping that valuable institution.

It certainly seems to me that if any portion of our subscriptions really does benefit this fund, it cannot be truly said we are not subscribers to it; and, I think, the call is more imperative by far upon those who, not being members, give no material support whatever to a Society from which it is, in my humble opinion, very short-sighted policy to keep aloof.

20, *High Ousegate, York*, W. C. Hayland.
January 17*th*, 1872.

Labelling,—Half doing it,—or, Prevention better than Cure.

The incautious mode of labelling is a frequent cause of trouble to the chemist; nevertheless, some will persist in half doing it, often to their sorrow. The other day, for instance, a case came under my notice, where a lady sent her servant to a chemist, near by, to procure some paregoric for her cold: an ounce was supplied; the bottle was labelled "Paregoric Elixir," with name and address of seller and one of the new poison labels. This was all very well and quite right, but where was she to find the dose? It was explained to the servant, but she forgot and evidently gave instructions at random (ʒij pro dosi, si opus sit). The dose was repeated three times in four hours (the patient was of weak constitution and unaccustomed to opiates or the like); in the course of an hour, as may be supposed, the patient became very unwell, and of course very uneasy. She sent to the chemist to know what to do; the usual remedies were applied, and all things set right again very soon. Now, had the dose been printed on the label these ill-effects would not have been caused; on the other hand, had the patient lived in the country—far from medical aid—greater anxiety and trouble would undoubtedly have followed, and the chemist branded with a bad name in that locality; but fortunately it occurred near to hand, and all the after unpleasantnesses were remedied by explanation.

May I beg to recommend that all such medicines be labelled with the dose attached, when chemists will be relieved considerably of what otherwise might happen, *i. e.* "a good blowing up." A number of small eruptions aggregated together form a large one, which ensues in a general burst, distributing its contents over the whole parish.

Scarborough, January 19*th*, 1872. W. R. F.

W. X. Y. Z.—The Pharmacy Act only requires that you should pass the specified examinations.

"*Chemicus.*"—You may obtain what you require from any philosophical instrument maker.

J. B. Carr.—Probably the fault lies in your aniline black.

C. Parkinson.—The 'Chemists and Druggists' Almanack' is the nearest approach to what you require, that we knew of.

H. X.—See the articles on the subject of "Glucose," in the first volume of this series, pp. 323, 794.

A. P. S.—You probably used liquor potassæ, B. P., which would be too weak for the purpose. The solution should have been as strong as possible in order to dissolve its own volume of phenol.

"*Musci.*"—(1.) The flower sent is a Poinsettia. (2.) It is permissible to use the foreign oil. (3.) We are unable to name the mosses sent.

L. S. R.—You would probably find a receipt in Cooley's 'Practical Receipts' or Beasley's 'Receipt Book.'

S. S.—The legal difficulties of the question are too great for us to solve. See the case reported on p. 617 of the present number.

J. H. Barrow.—It may be prepared in the same manner as the succus conii, B. P.

The following journals have been received:—The 'British Medical Journal,' Jan. 20; the 'Medical Times and Gazette,' Jan. 20; the 'Lancet,' Jan. 20; the 'Medical Press and Circular,' Jan. 24; 'Nature,' Jan. 20; the 'Chemical News,' Jan. 20; 'English Mechanic,' Jan. 19; 'Gardeners' Chronicle,' Jan. 20; the 'Grocer,' Jan. 20; the 'Journal of the Society of Arts,' Jan. 13; the 'American Journal of Pharmacy' for January; the 'American Chemist' for January; the 'Leavenworth Journal of Pharmacy' for January; the 'Wrexham Free Press,' Jan. 20; the 'Manchester Courier,' Jan. 19; the 'Salopian,' Jan. 20.

Communications, Letters, etc., have been received from Mr. E. Agnew, Mr. J. M. Fairlie, Mr. P. L. Simmonds, Mr. Cross, Mr. T. B. Groves, Messrs. Domeier, Mr. Leach, Mr. Pocklington, Mr. J. R. Jackson, Mr. B. Keen, Mr. C. R. Markham, Mr. E. Scott, M. P. S., A. P. S., S. R., "Vanilla," "Chemicus," "Dispenser," "Birchcliffe."

"An Anxious One" and "T. S. W." have not complied with the regulation as to anonymous communications.

THE MICROSCOPE IN PHARMACY.*

BY HENRY POCKLINGTON.

There is little doubt in my mind that so far as pharmacy is concerned the microscope is as yet in its infancy, but that it will at no distant date make a rapid stride towards an active and useful manhood. The same might have been written a very few years since of the microscope in medicine, but it has ceased to be true lately, and is, thanks to the new regulations of the Royal College of Surgeons in England, not likely ever again to be true. The utility of the microscope in pharmacy, by which term I mean pharmaceutical science, not mere shop-keeping, is not, perhaps, so obvious as in the sister science of healing, but a little inspection will show abundant circumstances in which the microscope is not only of service, but indispensably so. I hope, in the course of my papers, to bring forward some cases in support of this proposition, and in doing so to afford to non-microscopists such information as may enable them, if the possessors of an instrument, to put it to immediate practical and technical uses.

To meet the case of those, especially the students in provincial classes, who have not an instrument, but are intending to purchase, I have thought it advisable to give a few general hints as to the choice of a microscope suitable for the use of a pharmaceutical or medical student, and to add a few lessons in practical elementary microscopy; which hints advanced students may skip if they choose. I am induced to write on this point, because I have lately found many who have deprived themselves of the assistance the microscope would afford, under the impression that no instrument likely to be of the slightest service could be purchased at anything like a reasonable cost. This might have been true a few years since, but it is so no longer. Any of our leading makers will supply a good useful microscope, with all necessary lenses and apparatus, at a cost not exceeding £10. The instrument I have myself used cost me some years since less than £6, and I am not disposed to throw it aside in favour of any more showy and costly stand.

The essentials of a good working microscope may be very briefly summed up. The stand should be steady, and capable of being used vertically or adjusted to any degree of slant up to the horizontal for drawing with the *lucida*. The stage must be roomy, very firm, and have a good aperture. The mirror should be large, and have a plane as well as a concave reflecting surface, and must be adjustable as regards focus, in addition to being capable of being thrown aside from the axis of the instrument for the purpose of oblique illumination. The lenses should give a clear flat field, and a power ranging from 20 to 200 diameters; and the height of the eye-piece from the table, when a high power is used, should not exceed 10 or 12 inches.

Such an instrument, with the addition of a polariscope and fittings, will suffice for the ordinary work of either the pharmacist or the medical man, and may be purchased for £7 of any of half-a-dozen good makers in town and country. There are so many makers whose instruments answer the requirements of students, and are sold within the limits we have given, that we hesitate to particularize any; but in common justice I am bound to say that I have received from Messrs. Swift, of London, and Winspear, of Hull, the utmost courtesy and assistance in my many microscopical emergencies. The latter maker has especially been always ready to carry into effect any economical "dodge" to which fancy or the force of circumstances may have impelled me, and his "Student" strikes me as being so pre-eminently a student's instrument, that it affords me much pleasure to mention it in this place. I have seen and used the Student's or other cheap instruments of Messrs. Beck, Wheeler, Collins and others, of London; Dancer, of Manchester; and Husbands, of Bristol; and have no hesitation in recommending my readers to their very "tender mercies," in common with the not less worthy brethren for whose names I have no space.

In judging a microscope, the purchaser should see that the mechanical portions of the stand are well made, that the rack and pinion work smoothly, and the fine adjustment can be worked without throwing the object under view out of the field. This latter fault, known as "twist," is so excessively annoying, that its presence ought to secure the rejection of any stand, no matter how cheap or otherwise perfect. The stand should be firm, and the object should never "dance" under a moderate power, if even the table on which the instrument stands be shaken. The testing of the lenses is hardly possible to a beginner. He may, however, judge whether the margins of objects are seen with sharpness and absence of coloured fringes. The experienced microscopist alone can form a just opinion of the quality of a reasonably good lens, and the beginner should, therefore, either go to a good and established maker, or get the advice of a competent person before purchasing.

I have recently, in these columns, given a "Chapter on Microscopy," in which were some general directions as to the use of the microscope with regard to choice of light and position, avoidance of errors of interpretation and the like, and to it I must refer my readers for information upon those points. In that article I spoke of the "lumps of sugar" blunder in microscopy. This blunder, in one form or other, so largely obtains, that I will address myself at once to the consideration of the right way of using the microscope for the examination of animal, vegetable or mineral substances.

Those objects that do not require preparation.—These are, apart from "mounted slides," the reverse of numerous, and will almost all of them require to be viewed as opaque objects by reflected light. The use of reflected light is only admissible with low powers, unless special apparatus be made use of, and does not require much explanation. A "bull's eye" condenser is generally used to increase the amount of light reflected by the object under examination, and the adjustments of this do not possess a very wide range. The beginner should bear in mind that too much light is worse than too little, and should contrive that a larger field is illuminated than can possibly be occupied by the lens. The reason of this is, that the better portion of the condenser alone may be made use of, and that the peripheral portions of the impinging cone, usually coloured from the want of achromatism of the condenser, may not enter the objective. *Usually*, but

* The present article is introductory to a series of articles upon the use of the microscope in its application to pharmacy

not always, the illuminating pencil should fall as vertically as possible upon the object. Any variation from this will involve certain errors which must be eliminated by comparison of appearances, produced by varying the angle at which the pencil is incident. It is, of course, apparent that the safest plan is to vary the angle under any circumstance, and to view every object under as many conditions as possible. The merely superficial view of an object, which alone is possible by the use of reflected light under such simple conditions as I have now considered, is of so little value in giving anything approaching a knowledge of the nature of an object under observation that every student will desire to prosecute his researches considerably further, and to investigate the texture or structure. For this some preparation of the object is necessary.

Preparation of subjects.—By this I do not necessarily mean "mounting" as understood by microscopists. Preparation is one stage, an early one, of which mounting is a later stage, but not a necessary consequent. Immersion of the subject in some fluid of different refractive powers from itself is the simplest mode of preparation, and often the only necessary one. This is the case with many vegetable structures which are so transparent and thin as only to require immersion in water to fit them for examination. If the student wish to examine the petal of a flower, such as that of the pimpernel, his simplest plan is to take a glass slip, place the petal upon it, add a drop of water, and place upon it a cover of thin glass; in a very short time he will be able to make out the structure of the petal with tolerable facility and accuracy. Many structures require a fluid of a higher refractive power than water. Such of these as come within the scope of the pharmaceutical microscopist I shall treat more in detail presently. The major portion of the substances examined microscopically require some preliminary treatment of a chemical or a mechanical nature. We will regard these separately.

Chemical.—The value of reagents in microscopy does not seem to be so generally known to amateur microscopists as it should be. A somewhat long experience of them leads me to assert that little can be learned without their use. They are not numerous: acetic acid (fort. and dil.), sulphuric acid (dil. 1–4), nitric acid (1–4 dil.), iodo-ioduret of potassium in solution (1 gr. iodine, 3 grs. iodide of potassium, 1 oz. water), strong syrup, ether, nitrate of barytes in saturated solution, nitrate of silver (2 per cent. sol.), and oxalate of ammonia are those chiefly useful, and will be separately mentioned under the head of the purposes to which they are applicable. These reagents should be kept in small bottles, to which are adapted as stoppers the capillary tubes with india-rubber tied over the top, now so commonly sold as "dropping tubes." By the aid of these tubes an exceedingly minute drop may be applied to any desired portion of an object under observation, and the exclusion of foreign matter easily secured. It is hardly necessary to add that all chemicals used must be *pure*. Boiling, a mechanico-chemical operation, is often of great service in promoting the isolation of portions of a structure, but should not be had recourse to if less violent means will answer the end. Simple maceration in cold or warm water will be found of great service in the study of vegetable structure. The same may be said of maceration in syrup, glycerine, and dilute acids or alkalies, with respect to mineral and animal substances.

Mechanical.—Downright dissection when animal or vegetable structures are dealt with is generally the most useful, certainly the most instructive. Small scissors, scalpels, and sewing-needles fixed in handles are the tools generally used. For making sections a razor is best. The object, if small and soft, may generally be best held between the finger and thumb; if hard, held against a piece of glass, or fixed in a proper section cutter. This last instrument consists of a tube having a movable bottom. This bottom is attached to a screw with a fine thread. A milled head outside can be revolved between the finger and thumb, and the whole is usually so arranged that one revolution of the milled head raises the bottom of the tube, and also the object placed in the tube, through $\frac{1}{50}$th of an inch. Any less distance is, of course, easily got at by dividing the milled head into 10 or 20 proportional parts. With a little practice the student will be able easily to dispense with this somewhat costly apparatus, at all events for his ordinary laboratory work. Compression and "teasing" are of occasional service, but patient dissection is by far the best, and should be always followed when possible.

It is perhaps not worth while to extend these papers by giving long explanations of the mysteries of mounting. The art of mounting, apart from that of preparing the objects, may be summed up very briefly. It consists in fastening down the thin covers, so that they shall not be displaced by accident, or suffer the contained fluids to escape. When Canada balsam, Mr. White's dammar medium, and glycerine jelly are used, the object "prepared" is also mounted, and may be placed in a cabinet. When fluids are used, the edge of the cover must be luted down; for which purpose nothing is better than Mr. White's dammar, Bell's cement, or Bates's photographic varnish. All fluid having been removed from the edges of the cover, a thin coat of varnish is to be laid on and allowed to dry. A second, third, and fourth coat will finish the job, and make all secure. Those who require further information on this subject will probably go to the numerous and excellent text-books now before the public, and the subject is hardly one that can be discussed at length in these pages.

I now come to the more immediate subject of these papers, the using of the microscope in pharmacy. One of the great uses of the microscope in pharmacy is that of a detective to discover adulterations. But its great use is that of an educational agent, in that it enables the pharmacist to become familiar with the nature and structure of many of the substances with which he deals. To a certain extent these are related. The microscope can only be used as a detective by those who have already been educated by it into a knowledge of the nature and structure of the *genuine* substances they wish to distinguish from the spurious intermixed with them. For the present I do not propose to treat of the microscope as an educator, pure and simple. I shall deal with it as a detective, and as teaching pharmacists to become detectives also. *How to detect adulterations by means of the microscope* is then my subject henceforward, to the end of these articles.

(*To be continued.*)

THE ALGERIAN CALLITRIS.

BY JOHN R. JACKSON, A.L.S.,
Curator of the Museums, Kew.

Pounce is an article now seldom or never seen; indeed, the name itself is to many persons quite unknown. But before the general introduction of blotting-paper, pounce was in constant use with those who wield the pen. It is, or was, simply the powdered resin known in commerce as sandarach. This resin, in appearance, is not unlike mastich; it is, however, somewhat whiter, rather more transparent, and, as it belongs to the Coniferous Order, it partakes of the characteristic smell of those resins. It occurs in long thin tears, varying from a quarter to half an inch in length. Its chief use at the present time is for making a clear varnish. The tree which furnishes this resin is known as the Arar, and is the *Callitris quadrivalvis* of Vent. and the *Thuja articulata* of Vahl. It differs from the *Thujas*, however, in the form of its cones, which have four woody scales opening or dehiscing like an ordinary capsule. The tree is of a straggling growth, seldom or never exceeding 30 ft. high, but producing a hard, dark-coloured, highly ornamental wood, which is the *Thuja* or citron-wood of the ancients, and, it is said, was much valued for tables in ancient Rome. Cicero is stated to have possessed one the value of which was estimated at one million sestertia, equal to about £9000; and even still more fabulous prices are recorded as having been paid for them. The wood is considered almost indestructible by the Moors, who form the ceilings and floors of their mosques with it. It is now much used and esteemed in this country for small articles of furniture, and for inlaying in cabinet work. Two varieties of the tree appear to be known in Morocco; one, which is of much larger growth than the other, is said not to produce sandarach, but to yield the ornamental wood. From the roots of one or both varieties the natives prepare by bruising a thick kind of tar, which they use for various purposes; a thinner or more liquid kind is also made, which is very generally used as a caustic for wounds, more particularly for wounds on the backs of draught animals, such as the horse, mule, camel and donkey. For this purpose Europeans as well as natives have borne testimony of its efficacy.

CRYSTALLIZED ACONITINE.*

BY M. DUQUESNEL.

(*Continued from page* 604.)

Chemical Reactions.

Aconitine in the alkaloidal state, or as a solution of a neutral salt, nitrate for example, presents in the presence of reagents the following characters:—

Nitric Acid gives a solution, pure and simple, without colour.

Dissolved in dilute *Phosphoric Acid*, and evaporated to a certain degree of concentration, it gives, as indicated by M. Otto, a violet coloration. This reaction is obtained with difficulty, but is valuable as being the only coloured reaction peculiar to aconitine. *Sulphuric acid* gives a similar result, but yields the same coloration with other alkaloids.

Weak Acids rapidly dissolve aconitine with the formation of non-deliquescent salts, crystallizable in a neutral liquor, and easily recognized under the microscope.

Fixed Alkalies precipitate aconitine as a white gelatinous magma, which, when a solution of impure and coloured alkaloid is used, contains much colouring matter.

Ammonia acts similarly, but sometimes precipitates the alkaloid slowly, especially if it is in combination with hydrochloric acid. From a warm solution the alkaloid is sometimes precipitated in a crystalline form.

Carbonate and Bicarbonate of Potash give an abundant white precipitate insoluble in an excess. This precipitate does not form in the presence of tartaric acid if the solution be too dilute. From a more concentrated solution the alkaloid is sometimes obtained in crystals.

Phosphate of Soda, Neutral and Basic Acetate of Lead, Gallic and Pyrogallic Acids give no precipitate.

Picric Acid gives a slowly forming yellow precipitate, soluble in excess of ammonia.

Tannin gives a plentiful white precipitate, insoluble in acidulated water.

Chloride of Gold and *Chloride of Platinum* give yellowish-white precipitates, insoluble in excess of water, soluble in alcohol.

The double *Iodide of Mercury and Potassium* * is an extremely delicate test for aconitine, giving a precipitate if the alkaloid be present in acidulated water, in the proportion of one part in twenty thousand. The double iodide of mercury and aconitine so formed is dull white, or yellowish-white. Melted it becomes greenish and transparent. Sulphuric acid added to peroxide of barium gives it a yellow colour, which becomes red on warming; nitric acid turns it a reddish-brown, approaching to brick-red. Heated in a test-tube, the precipitate acquires a vermilion colour, which partly disappears on the addition of water, but reappears if the liquor be strongly acidified. At a sufficiently high temperature this double iodide gives off fetid vapours with an odour similar to that of cacodyle; upon cooling, the sides of the tube are covered with minute, colourless, acicular crystals.

Solution of Iodine gives a kermes-brown precipitate.

Periodide of Potassium gives a kermes-brown precipitate, and is the chemical antidote to aconitine.

Sulpho-cyanide of Potassium, after a short time, gives a white microscopic crystalline precipitate.

Salts of Aconitine.

With the exception of Mr. Groves, who contributed some specimens of crystalline salts of aconitine to the International Exhibition of 1862, and afterwards described the method of their preparation,† chemists who have studied this alkaloid have hitherto generally spoken of it as forming uncrystallizable and non-deliquescent salts. But the crystallized aconitine of M. Duquesnel forms, with the majority of acids, salts that are easily crystallizable, provided

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* De l'Aconitine Cristallisé et des Préparations d'Aconit, Étude Chimique et Pharmacologique. Par H. Duquesnel, Pharmacien de Première Classe. Paris: Baillière et Fils.

* Winkler's formula for this compound is—

Corrosive Sublimate	13·546 grams.
Iodide of Potassium	49·000 ,,

Distilled Water to 1 litre.

† PHARM. JOURN., 2nd Ser. Vol. VIII. p. 121.

that the solutions be perfectly neutral, an excess of acid generally preventing the crystallization. The following are the principal mentioned by the author, with the methods of preparation:—

Sulphate of Aconitine.—Saturate dilute sulphuric acid with an excess of aconitine, slightly warming the mixture until the saturation is complete; filter the solution warm, and evaporate at a very gentle heat. A semi-vitreous mass is thus obtained, appearing under the microscope only as a confused crystallization of the sulphate in very slender needles. This salt is not deliquescent.

Hydrochlorate of Aconitine.—By a similar process to the above this salt may be obtained in rhombic crystals, the size and regularity of which are increased by the slowness of the evaporation.

Nitrate of Aconitine.—Obtained in a similar manner to the two preceding, by saturating completely dilute nitric acid with crystallized aconitine, and evaporating the solution at a gentle heat. It forms fine rhombic or short prismatic crystals, colourless and transparent, but slightly efflorescent, and becoming vividly coloured in a ray of polarized light. This salt, less soluble in water than the preceding, gives a solution perfectly neutral to test paper, which is suitable for hypodermic injections. The author prefers it to all the others for medicinal use, as it crystallizes with great facility in well-defined crystals, keeps without alteration, and can be purified by successive crystallizations and decoloration by animal charcoal without losing its properties.*

A more direct simple method is to stir the ethereal solution of the extract from the root with a glass rod that has been dipped in nitric acid. Upon each immersion of the rod charged with acid a white cloud of nitrate of aconitine insoluble in ether is formed until the whole of the aconitine is transformed into nitrate. After a few minutes it is deposited upon the sides and bottom of the vessel. It is colourless neutral, and always crystalline, the crystals being generally microscopic. The author states that he has not been able to obtain similar results with other substances called aconitine, as they only yielded amorphous nitrates.

Aconitate of Aconitine.—When aconitine is dissolved in aconitic acid,—the acid which is present in the root,—a salt is obtained which crystallizes with difficulty even when the acid is exactly saturated, has a gummous appearance and is non-deliquescent in excess of acid. If the acid aconitate of aconitine, and *à fortiori*, the neutral aconitate, be agitated with chloroform or ether, the chloroform, which does not appreciably dissolve aconitic acid, dissolves the aconitate with facility; while ether, in which the acid is soluble, partly precipitates the aconitine from its solution in chloroform. M. Duquesnel therefore thinks it cannot at present be decided whether the aconitine exists in the aconite in a free state, since chloroform and ether, which in general dissolve only the alkaloids, carry off from the aconite root its alkaloid, as well as the combination which probably it forms in the plant with aconitic acid.

Action of Iodine upon Aconitine.—When a small quantity of tincture of iodine is added to an alcoholic solution of crystallized aconitine, the liquid acquires a greenish colour. If water be added, it becomes milky, and deposits crystals. If the whole be shaken with ether, the milky solution clears and settles into two distinct layers: the one ethereal, which, upon evaporation, deposits, in the ordinary form, the aconitine that was in excess; the other aqueous, which, by careful evaporation, yields short prismatic crystals, grouped in fascicles, terminated by dihedrous summits, and becoming vividly coloured in polarized light.

Whether these crystals, containing iodine, are the iodide of a new base, resulting from a change in the aconitine, analogous to the bromo-codeine, or whether it is a simple iodide of aconitine, the author leaves for future analysis to decide. If an excess of tincture of iodine be added to the alcoholic solution, instead of the crystals, a brown matter insoluble in ether is obtained, which probably is a biniodide.

Action of Bromine upon Aconitine.—Analogous results are obtained when bromine, in the shape of bromine-water, is used in the place of the tincture of iodine, the aqueous solution yielding, upon evaporation, rhombic crystals of bromide of aconitine, or one of its derivatives, of which the nature must be determined by analysis. When the bromine is in excess, crystals are obtained as elongated prisms with dihedrous summits.

Comparative Examination of Different Aconitines.

The author next describes the results of an investigation of the physiological effects of various substances known under the name of aconitine, or extracts of aconite, with a view to ascertain to what extent the crystallized aconitine represents the active principle of the root.

For this purpose he experimented with (1) the aconitine of the Codex, prepared by M. Hottot; (2) German aconitine (Merck's); (3) amorphous French commercial aconitine; (4) napelline, prepared by M. Hubschmann. Not being able to obtain a specimen of Morson's napelline, it was estimated according to a report on its properties by M. Hottot.

The first experiment consisted in the subcutaneous injection into an adult sparrow of half a milligram of each substance dissolved in two drops of slightly acidulated water. With the crystallized aconitine death followed in one minute; with the aconitine of the Codex, in fifteen minutes; with the German aconitine, in an hour and a quarter; with the French aconitine of commerce, in two hours. Death did not follow the injection of Hubschmann's napelline, but only a profound slumber.

In the second experiment, the same quantity was injected, in the usual manner, into an adult sparrow, death resulting from the use of the crystallized aconitine in half a minute, from the aconitine of the Codex in four minutes, from the German aconitine in three-quarters of an hour, and from the French aconitine of commerce in an hour and a quarter. Hubschmann's napelline did not cause death, but only a profound slumber.

It would appear from these experiments, repeated many times under varying conditions of temperature and season, that the crystallized aconitine represents

* Mr. Groves says (PHARM. JOURN. 2nd Ser. Vol. VIII. p. 122) of the partly crystalline, partly amorphous aconitine obtained by his process, when treated with nitric acid, "I find it crystallize much more easily as nitrate than as sulphate or hydrochlorate." Also, "From its solution in hot water it [the nitrate] crystallizes with unusual facility." Professor Flückiger, too, says (PHARM. JOURN. 3rd Ser. Vol. I. p. 122), "The nitrate can be obtained in well-developed microscopic crystals."

in a higher degree than any other substance the active principle of the aconite.

As various authors have spoken of a narcotic principle contained in the aconite, M. Duquesnel has sought to obtain such evidence as would enable him to verify or disprove its existence. By concentrating the solution containing the excess of bicarbonate of soda after all the aconitine has been removed, he obtained an extract or residue representing all the principles of the alcoholic extract of aconite root, less the aconitine and the resinous matter insoluble in water removed by the filter. After drying this alkaline residue, and mixing it with a little pure silica in order to divide it more easily, it was agitated several times with sufficient chloroform to carry off the last traces of aconitine, dissolved in alcohol and again evaporated, when a yellowish deliquescent extract was obtained. This extract still contained an active principle, for, when administered to a bird, it produced a profound slumber, lasting several hours, without anæsthesia, followed by a complete recovery; but when a larger dose was administered, the slumber was followed by death. The author proposes to investigate this matter further, in order to ascertain whether these effects are due to a substance different from aconitine, such as Hubschmann's napelline, or to traces of aconitine.

(*To be continued.*)

XYLOL.

This hydrocarbon is likely to become of great importance, if its application in cases of smallpox is really followed by such good results, as have hitherto been obtained at Berlin.

The Berlin *Klinische Wochenschrift* states that Dr. Zuelzer, Senior Physician at the Charité Hospital, had there administered xylol in cases of smallpox, with the most complete success. It is given in doses of from 3 to 5 drops for children, 10 to 15 drops for adults, every hour to every three hours. It is harmless, because as much as a teaspoonful at a time has been taken. The most convenient form of taking it is in capsules, as already supplied by a Berlin firm, and containing 3, 5, 8, and 12 drops each.

The specific action is not yet clearly defined, but early information on this point is promised. The theory at present is that xylol is taken up by the blood, and acts as a disinfectant.

The absolute purity of the xylol is important, as toluol and other analogous compounds do not possess this peculiar action, and it seems there are some practical difficulties in obtaining xylol absolutely pure.

Xylol, or xylene, C_8H_{10}, was first separated from coal naphtha by Dr. Hugo Müller; it is obtained by fractional distillation until a distillate is obtained of about 140° C. boiling-point; this is mixed with sulphuric acid, which dissolves xylol, forming xylol sulphuric acid; this acid is decomposed by dry distillation, and the xylol thus obtained is further purified.

Pure xylol is colourless, it has a faint odour, somewhat like benzol, but different, boiling-point 139° C., specific gravity 866.

Chapters for Students.

CHEMICAL NOTES TO THE PHARMACOPŒIA.

BY WILLIAM A. TILDEN, D.SC. LOND.

DEMONSTRATOR OF PRACTICAL CHEMISTRY TO THE PHARMACEUTICAL SOCIETY.

Potassæ Prussias Flava.—Ferrocyanide of potassium. $K_4FeC_6N_6, 3H_2O$. [§ A salt obtained by fusing animal substances, such as the cuttings of horns, hoofs and skins with carbonate of potash in an iron pot, lixiviating the crude product with water, and purifying the salt by crystallization.]

When potassium or sodium is heated strongly with a substance containing carbon and nitrogen, a cyanide is formed. When the animal matters are fused with carbonate of potassium, the potassium is reduced probably to the metallic state, and by immediate union with carbon and nitrogen from the organic matter cyanide of potassium is produced. The ferrocyanide is not formed until the mass is treated with cold water, when the cyanide dissolves the iron with which it is in contact; a certain amount of hydrogen gas is then evolved, though the greater part by absorption of oxygen from the air is converted into water,

$$6[KCN] + Fe + 2H_2O = K_4FeC_6N_6 + 2KHO + H_2.$$

A considerable loss of material occurs at every stage of the process; and several other minor reactions go on at the same time, being chiefly due to impurities in the pearlash.

Ferrocyanides contain the elements of cyanide of iron and some other cyanide, but they do not present the properties of simple cyanides which such a combination would have. On the contrary, the iron is united with the carbon and nitrogen to form a compound quadrivalent radicle $(FeC_6N_6)^{iv}$, in which the iron cannot be recognized by ordinary precipitants.

An important difference between the two classes of salts exists in the fact that, whilst all the cyanides,—whether single, that is, containing one metal, or double, containing two,—are fearfully poisonous, the ferrocyanides are harmless, except, of course, in case of compounds containing poisonous metals. Even then, in consequence of their general insolubility, they are not very active.

Ferrocyanide of potassium crystallizes in large yellow four-sided tables, which are tough, but cleave easily. [§ The aqueous solution precipitates deep blue (Prussian blue $(Fe_2)_2(FeC_6N_6)_3$) with persulphate of iron, brick red with sulphate of copper, and white with acetate of lead. Heated with diluted sulphuric acid, hydrocyanic acid vapours are evolved.] See Ac. Hydrocy. Dil. Heated with strong oil of vitriol, it undergoes a different decomposition, in which the elements of water take part.

$$K_4FeC_6N_6 + 6H_2SO_4 + 6H_2O = 2K_2SO_4 + FeSO_4 + 3[(NH_4)_2SO_4] + 6CO.$$

This is the process of Fownes for preparing pure carbonic oxide.

When ferrocyanide of potassium is melted by the application of heat it is resolved into cyanide of potassium, which remains unchanged, and cyanide of iron, which is decomposed with evolution of nitrogen gas and deposition of a compound of carbon and iron. But if fused with carbonate of potassium a reaction occurs, by which the cyanide of potassium of commerce is produced.

$$K_4FeC_6N_6 + K_2CO_3 = 5KCN + KCNO + Fe + CO_2.$$

Commercial cyanide, therefore, contains invariably cyanate of potassium. This can be destroyed by fusion with a small quantity of charcoal.

Red Prussiate of Potash (App. I., B.P.).
$K_6(Fe_2C_{12}N_{12})$.

Prepared by transmitting chlorine gas through a solution of the yellow prussiate till a drop taken out and tested with a ferric salt ceases to give the characteristic precipitate of Prussian blue. The chlorine simply removes one-fourth of the potassium as chloride, the two residues coalescing to form the ferricyanide.

$$\left.\begin{matrix}K_4Fe''C_6N_6\\K_4Fe''C_6N_6\end{matrix}\right\} + Cl_2 = K_6(Fe_2)^{vi}C_{12}N_{12} + 2KCl.$$

The salt crystallizes from water in deep red right rhombic prisms.

Both ferro- and ferri-cyanides are interesting not only on account of their practical applications, but their singular constitution. In the ferrocyanides the single atom of iron is in the ferrous state (Fe''), in the ferricyanides the double atom $(Fe_2)^{vi}$ is ferric and sexivalent. The ferricyanide of potassium is sometimes employed as an oxidizing agent; this it effects in alkaline liquids by becoming reduced to ferrocyanide. Thus,—

$$2[KHO] + K_6Fe_2C_{12}N_{12} = 2[K_4FeC_6N_6] + H_2O + O.$$

Potassæ Sulphas, K_2SO_4.—Generally prepared by neutralizing with carbonate of potassium the residue left after the distillation of nitric acid from nitre.

The crystals are usually very distinct and easily recognized.

[§ Colourless hard six-sided prisms terminated by six-sided pyramids.]

Potassæ Tartras, $K_2C_4H_4O_6$.—By neutralizing a hot aqueous solution of carbonate of potassium with cream of tartar, a solution is obtained which, when concentrated, yields small prismatic crystals. It is easily recognized by its neutrality to test-paper, ready solubility in water, and by giving when mixed with acetic acid a precipitate of acid tartrate.

Potassæ Tartras Acida.—[§ $KHC_4H_4O_6$. An acid salt obtained from the crude tartar, which is deposited during the fermentation of grape juice.]

Tartar exists in grape juice ready-formed, and therefore, in consequence of its insolubility in alcohol, separates out in the crystalline form, as that substance is developed during fermentation in the manufacture of wine.

Crude argol is more or less coloured, and often contains tartrate of calcium in quantities by no means inconsiderable.

Cream of tartar is soluble in about 180 parts of cold water, insoluble in spirit.

Heated it leaves a black residue of potassic carbonate mixed with carbon.

NATIVE POISONS OF INDIA.*

BY P. A. SIMPSON., M.D.,

Professor of Medical Jurisprudence, Anderson's University.

(*Continued from page* 606.)

Datura.—The Datura (or thorn-apple, so called from its spiny capsule; corolline æstivation being more or less imbricated, never valvate) is another member of the Solanaceous (or Atropaceous group, which is of very long standing in India as a virulent poison. It is chiefly the fruit and seeds that have hitherto been examined, but probably the whole plant is poisonous. It owes its poisonous properties to a peculiar alkaloid (first discovered by Brande, a German chemist) which is named daturine or daturia, but which has not been rendered available in medicine.

Symptoms.—The symptoms produced by a poisonous dose in man are very variable, but the leading features are delirium, dilatation of the pupils, and stupor; sometimes spasms, and occasionally paralysis. An Indian writer of ancient date thus describes its effects, "they have an herbe called durroa, which causeth distraction, without understanding anything done in a man's presence; sometimes it maketh a man sleep as if he were dead, the space of 24 hours, except his feet be washed with cold water, which restoreth him to himself. In much quantity it killeth." Not only is datura employed in India as a directly poisonous substance, but also by women under the idea that they may thereby regain the affections of their husbands when the former have become weak. So early as the middle of the seventeenth century datura was employed in India in the punishment of state criminals, and it is used in many parts of India, for this purpose, up to the present day. For the purpose of facilitating theft and other criminal designs, the seeds of datura are very commonly given in India with sweetmeats, merely to stupefy rather than with a view of killing: intoxication or delirium in such cases is seldom produced, but the person sinks into profound lethargy, resembling coma, with dilated pupils but natural respiration. These symptoms have been known to continue even for two days, and still recovery take place; cold affusion and strong stimulant emetics constitute the most effectual treatment, and the vision often remains obscured long after the general recovery takes place. If given when the stomach is empty, a very small dose may produce all the dangerous symptoms, and prove fatal. This fact is well known to all the Indian poisoners, who suit the time of administration to the purpose they mean to serve.

Species.—The plants of this genus include various species. The *Datura Stramonium* is found in waste places throughout Europe, but its habitat extends to the Himalayas, and even to North America. The species, however, which are peculiarly indigenous to India are, *D. fastuosa* (which is purple-flowered), *D. alba* (white flowered) and *D. ferox.* The purple-flowered variety is comparatively rare, but the white variety (*D. alba*) grows luxuriantly on the dunghill of nearly every peasant's hut in many parts of India, especially Bengal. It is seen also in the roadsides and other waste places. The goats feed greedily upon it, and there is good reason to believe that it is cultivated not only for the goats, but for criminal purposes as well. It makes its appearance soon after the monsoons, and thrives with great vigour, pushing forth its large conspicuous tubular corolla, and giving beauty to otherwise uninteresting localities. The other variety (*D. ferox*) is found chiefly on the Malabar coast. It was for a long time a disputed point in India, whether *Datura* was a substance capable of producing fatal results, or whether it had merely the effect of stupefying its victim. It is now, however, pretty clearly proved that the latter view (which obtained general credence as lately

* Read before the Glasgow Chemists' Association, Jan. 10, 1872.

as forty years ago) was not only a very dangerous, but also a very erroneous one. There is now no doubt whatever that the fresh seeds, capsules and leaves of the Indian Daturas are very deadly; perhaps almost certainly so when taken in full doses, and when early methods are not taken for evacuating the poison by emetics and purgatives. Out of ninety-two recorded cases, no less than twenty-one proved fatal, and it is probable that many other cases that result in death never come to light. The clear decision of this question was formerly a matter of the greatest moment in India, since the old law drew a marked difference between the crime of administering *poisonous* drugs to persons, with a view of robbing them when in a state of insensibility, and substances of a *merely intoxicating* character (and not of a nature to endanger life) for the same purpose. This question is now set completely at rest by the present Penal Code of India, which places in the same category "any poison or any *stupefying, intoxicating* or *unwholesome* drug." Among the various notices which give rise to the criminal administration of *Datura* in India, perhaps the most remarkable is, that it is occasionally given by relatives to the natives who evince an inclination to embrace Christianity; with the view, of course, of rendering them unable to comprehend any arguments which might alienate them from the religious tenets of their forefathers. *Datura* is, moreover, administered by unprincipled natives to aged and weak-minded relatives and others, whom on account of their wealth, or for other reasons, they are anxious to reduce to a state of utter helplessness and imbecility. In some cases where *Datura* is given, insensibility occurs almost immediately, and this probably happens when the poison is administered in solution or in very fine powder. When the seeds are given, the symptoms continue as long as any of them remain in the intestinal canal, and probably in many cases much longer. It is important to be borne in mind that, when persons have been drugged with this poison, more than a week should be allowed to them to recover their memory, for as long as the seeds lurk in the bowls the memory is not to be depended on. There appears to be no drug known at the present day, which represents in its effects so close an approach to the system of "*slow poisoning*," believed by many to have been practised in the middle ages (and which is so frequently alluded to by Pliny and his contemporaries), as does the *Datura*.

Indian Hemp.—Next as regards Indian hemp, or *Cannabis indica*, which is grown in India, Persia and Africa. This belongs to a subdivision of the Natural Order *Urticaceæ*, otherwise "the nettle and hemp" Order.

Cannabis sativa is the common hemp plant, which has been cultivated from the earliest times for the purposes of manufacture. The Indian variety—*Cannabis indica*—possesses powerful narcotic qualities. Its leaves are covered with a resinous matter, called "churrus." The larger leaves and capsules are called "bhang;" while the dried plant which has flowered, and from which the resin has not been removed, is termed "gungah" or "haschish." This "gungah" or "haschish," consisting of the tops and tender parts only of the plant, is collected immediately after inflorescence and simply dried. This plant is much used for intoxication in India, but it is curious that the Indian variety, when grown in Britain, does not possess narcotic qualities, and, although the plant grows well, and attains a height of ten feet or more, it does not produce the resinous varnish on the leaves. The absence of this resin seems to be the only difference which distinguishes the common hemp of this country —the *Cannabis sativa*—from the so-called Indian hemp; with this one distinction, the two appear to be botanically similar. The mode in which this resin (or churrus) is obtained, differs in different parts of India. For instance, in Nepaul, it is extracted by rubbing the leaves of the plant gently between the hands, until these become sufficiently charged with the juice, which adheres to the palms, in the form of a dark, viscid and tolerably consistent substance; this, being removed with a spatula, is made up into lumps, which, when unrefined, are sold under the name of "churrus;" when this "churrus" is clarified, it is called "momes," and in this condition it burns with a bright flame.

In Central India, on the other hand, men clad in leathern dresses run through the hemp fields, brushing through the plants with all possible violence; the soft resin adheres to the leather, and is subsequently scraped off and rolled into balls. In some instances the leather attire is dispensed with, and the resin is gathered on the skins of the naked coolies.

Gungah.—The practice of smoking and eating "*gungah*" is of great antiquity and exceeding prevalence in the East, extending over several hundred years. The *Assassins* (Haschischi), the homicidal followers of "*the old man of the mountains*," are held to have derived their name from the use of Haschish, or hemp-tops. History shows that the vicious use of this substance prevailed extensively in Mussulman India so long as a century ago. Regarding the practice at that period, we are told that "the tops of the hemp, being pounded with water and a mixture of some spice, afford a thick liquor of a dirty green (bhang), with which low people procure themselves a flush in the cheeks and eyes, and a momentary flow of spirits that borders on intoxication; but it is to fall again into a greater lowness of spirits than ever. It is fifty times cheaper than gin is in England; and, being a narcotic, it answers the purpose of a provocative, a denomination under which anything will go down with an Indian." The same writer, speaking of a "bhang" shop, says, "It may be kept with a capital of no more than two shillings. It is only some mats stretched under some trees, where the vilest of mankind assemble to drink 'bhang,' which possesses such intoxicating charms that there is no parting any more with it when a man has once used it for a couple of weeks. But in two years' time it always reduces a man to a skeleton, and stupefies his mind totally."

The gungah is never smoked without tobacco. The two are kneaded together with the thumb in the palm of the hand, so that this action is at once recognized by every gungah-smoker as indicating his habit. When a pipe is not available, the native makes a small hole in the ground, in which he places his smoking mixture, and having inserted sideways into this hole a long hollow reed, he enjoys his mother earth in a way, and to an extent, unknown in this country. Another ingenious substitute for a pipe consists of a damp leaf rolled up in a conical shape, the apex of the cone being inserted into the closed hand, which serves as a stem for the pipe. It is a curious fact, that as a rule the votaries of gungah smoke the drug in company, and never singly. A gungah smoker may often be distinguished by his appearance, which is always dry and rickety, eyes sunken and cheeks flattened. A gungah smoker can never be plump, and if the habit of excessive indulgence be long persevered in it brings on diarrhœa or dysentery. These evils may be, in a great measure, counteracted by a plentiful diet of milk and other substances containing a large quantity of oily ingredients. It is a peculiarity of gungah smoking that it makes the person with whom the indulgence has become a habit choleric and irascible, rough in manner and speech. There is a curious difference between the excessive use of opium and gungah. If an opium eater be ill, and you entirely withhold his favourite drug, he will rapidly sink; whereas the excessive use of gungah by smoking may be suddenly stopped without producing any injurious results thereby. The crime of murdering people while intoxicated by hemp is one which might be expected to be of frequent occurrence among a people, the lowest and most depraved of whom are continually drugging themselves with this narcotic, and yet the abuse of *Cannabis indica* for this purpose is almost unknown in India.

(*To be continued.*)

THE ECONOMIC PRODUCTS OF EUCALYPTUS TREES.*

Continuing his notice of the economic products of forest trees, Dr. Mueller next describes another industry —one quite unique and peculiar to Australia, namely, the distillation of volatile oil from Eucalyptus and allied Myrtaceous trees. While charcoal, tar, wood-vinegar, wood-spirit, tannic substances, and potash are obtainable and obtained from the woods of any country, there is in Australia a peculiar resource in the Eucalyptus oil. In no other part of the globe do we find the *Myrtaceæ* to prevail; in Europe it is only the Myrtus of the ancients, the beautiful bush for bridal wreaths, which there represents this particular family of plants; and although copious species of Eugenia and other berry-bearing genera, including the aromatic clove and allspice, are scattered through the warmer regions of Asia, Africa, and America, all pervaded by essential oil, they do not constitute the main bulk of any forests as there, nor can their oil in chemic or technic properties be compared to that of the almost exclusively Australian Eucalyptus. This special industry exemplifies also, in a manner quite remarkable, how from apparently insignificant experiments may arise results far beyond original anticipations. It is now possible to produce the oil at a price so cheap as to allow the article to be used in various branches of art—for instance, in the manufacture of scented soap, it having been ascertained that this oil surpasses any other in value for diluting the oils of roses, of orange flowers, and other very costly oils, for which purpose it proves far more valuable than the oil of rosemary and other ethereal oils hitherto used. As this became known, such a demand arose that a thoughtful and enterprising citizen of Melbourne was able to export about 9000 lb. to England and 3000 lb. to foreign ports, though even now this oil is but very imperfectly known abroad. The average quantity now produced at his establishment for export is 700 lb. per month. Alcoholic extracts of the febrifugal foliage of *Eucalyptus globulus* and *E. amygdalina* have also been exported in quantity by the same gentleman to England, Germany and America. Similar substances from various Melaleucas might be added. Originally an opinion was entertained that all the Eucalyptus oils had great resemblance to each other; such, however, proved not to be the case when accurate experimental tests came to be applied. Thus, for instance, the oil, which in such rich percentage is obtained from *Eucalyptus amygdalina*, though excellent for diluting the most delicate essential oils, is of far less value as a solvent for resins in the fabrication of select varnishes. For this latter purpose the oil of one of the dwarf Eucalypts forming the Mallee Scrub, a species to which Dr. Mueller gave, on account of its abundance of oil, the name *Eucalyptus oleosa*, nearly a quarter of a century ago, proved far the best. It is this Mallee oil, which is now coming into extensive adaptations for dissolving amber, Kauri resin and various kinds of copal. Mr. Bosisto's researches are recorded in the volume of the Royal Society of Victoria for 1863; Mr. Osborne's, in the Jurors' Reports of the Exhibition of 1862. In alluding so far to this oil distillation, Dr. Mueller said he had a special object in view. He wished to see it adopted far and near as a collateral forest industry, now that the way for the ready sale of the product is so far paved. The patentee is willing to license any person to adopt his process, and he is also ready to purchase the oil at a price which would prove remunerative to the producer. If it is now considered how inexhaustible a material for this oil industry is everywhere accessible in the Australian ranges, how readily it is obtainable, particularly at saw mills and at splitters' establishments, and how easily the process of the distillation can be performed, it really seems surprising that these facilities should not be seized upon, and that under such favourable circumstances a far larger export of this mercantile commodity should not be called forth. Those Eucalypts are the most productive of oil from their leaves, which have the largest number of pellucid dots in these organs; this is easily ascertained by viewing the leaves by transmitted light, when the transparent oil-glands will become apparent, even without the use of a magnifying lens. Mr. Bosisto is also a purchaser of scented flowers, indigenous as well as cultivated, including even the Wattle flowers, for the extraction of delicate scents, under a clever process discovered by himself; and it is astonishing what an enormous demand for these perfumes exists in European markets. This may be a hint to any one living in or near the forests where the extraction of the scent could be locally accomplished from unlimited resources, with little trouble and cost.

There exists another special industry in its incipient state, which might be regarded as essentially Australian, and which also might be widely extended; namely, the gathering of seeds of many kinds of Eucalyptus, and also of some Acacias and Casuarinas, for commercial export. No doubt the collecting of seeds is effected among the forest trees of any country, and very important branches of industry these gatherings are in very many localities abroad. But what gives to the Australian export trade of forest seeds such significance is the fact, that there is thereby offered means of raising woods with far more celerity and ease than would be possible through dissemination of trees from any other part of the globe, it being understood that the operations are instituted in similar climatic zones. Trees with softer kinds of woods, such as poplars and willows, even though they may rival some of the Eucalypts in quickness of growth, cannot be well drawn into comparison, as most of them do not live in dry soil, nor attain longevity, nor assume gigantic dimensions, nor furnish timber of durability. But there are still other reasons, which have drawn the Eucalypts into extensive cultural use elsewhere—for instance, in Algeria, Spain, Portugal, Italy, the south of France, Greece, Egypt, Palestine, various uplands of India, the savannahs of North America, the llanas of South America, at Natal, and other places in South Africa, and even as near as New Zealand.* One of the advantages offered is the extraordinary facility and quickness with which the seeds are raised, scarcely any care being requisite in nursery works,—a seedling, moreover, being within a year, or even less time, fit for final transplantation. Another advantage consists in the ease with which the transit can be effected, in consequence of the minuteness of most kinds of Eucalyptus seeds,† there being besides no difficulty in packing on account of the natural dryness of these seeds. For curiosity's sake Dr. Mueller had an ounce of the seed of several species counted, with the following results:—

Blue-gum tree, 1 ounce—sifted fertile seed grains, 10,112.

Stringy-bark tree (unsifted), 21,080.

Swamp-gum tree (unsifted), 23,264.

Peppermint Eucalypt (unsifted), 17,600.

According to this calculation 161,792 plants could be raised from 1 lb. of seeds of the blue-gum tree. If only half the seeds of such grew, the number of seedlings would be enormous; and even if only the seedlings of one quarter of the seeds of 1 lb. finally were established they would suffice, in the instance of the blue-gum tree, to cover 404 acres, assuming that we planted at the rate of

* From Baron von Mueller's Lecture on Forest Culture. See *ante*, p. 565.

* The seeds of *Eucalyptus rostrata* (red-gum tree) are available for all tropic countries, inasmuch as this species, which is almost incomparably valuable for its lasting wood, ranges naturally right through the hot zone of Australia.

† The seeds of the West Australian red-gum tree (*Eucalyptus calophylla*) and the East Australian bloodwood-tree (*Eucalyptus corymbosa*) are comparatively large and heavy.

100 trees to the acre (allowing for thinning-out). The following notes for comparison may be of interest:—

		Grains.
1 oz. of seed of *Pinus Pinaster*	contains	750
1 " " " *Pinea*	"	38
1 " " " *halepensis*	"	940
1 " " " *alba*	"	10,080
1 " " *Cupressus sempervirens*	"	4970
1 " " *Fraxinus Ornus*	"	316
1 " " *Betula alba*	"	34,560
1 " " *Acer Pseudo-Platanus*	"	183

It seems marvellous that trees of such colossal dimensions, counting among the most gigantic of the globe, should arise from a seed grain so extremely minute.

The exportation of Eucalyptus seeds has already assumed some magnitude. The monthly mails convey occasionally quantities to the value of over £100; the total export during the last twelve years must have reached several, or perhaps many, thousand pounds sterling. For the initiation of this new resource, through his extensive correspondence abroad, Dr. Mueller can lay much claim; and he believes that almost any quantity of Eucalyptus seed could be sold in the markets of London, Paris, Calcutta, San Francisco, Buenos Ayres, Valparaiso, and elsewhere, as it will be long before a sufficient local supply can be secured abroad from cultivated trees.

Monsieur Prosper Ramel, of Paris, stands foremost among those who promoted Eucalyptus culture in South Europe.

THE ACTION OF QUININE ON THE BLOOD.

The nature of the influence exerted upon blood by quinine has recently been the subject of a fresh investigation by Schulte.* Its extraordinary power of stopping fermentation and putrefaction by destroying low organisms, such as bacteria and fungi, has been before pointed out. It is supposed to diminish the formation of pus in inflammation, by arresting the motions and preventing the exit from the blood-vessels of the white blood corpuscles, the accumulation of which, according to Conheim, constitutes pus. By depriving the red blood-corpuscles of the power to produce ozone, it diminishes the change of tissue in the body, and thereby lessens the production of heat. Ranke and Kerner have shown the waste of tissue is reduced when large doses of quinine are administered, as indicated in the smaller proportion of uric acid and urea excreted.

With the object of ascertaining whether this effect is referable to the direct influence of quinine or oxidation in the blood or to its indirect influence through the nervous system, Schulte employed a method based upon the changes occurring in the alkalinity of the blood, observed by Zuntz, who had noticed that a considerable formation of acid takes place in freshly-drawn blood, and continues in a less degree till putrefaction commences. The amount of acid formed was estimated from the diminished alkalinity of the blood, as comparatively shown by the quantity of dilute phosphoric acid required for exact saturation. A sufficient quantity of chloride of sodium was added to the phosphoric acid to prevent the blood corpuscles from being dissolved and interfering with the reaction by their colouring matter. The point of saturation was fixed at the transient reddening of carefully prepared test-paper by the carbonic acid. Schulte has thus been enabled to confirm the experiments of Kuntz and Scharrenbroich, showing that quinine and berberine lessen the production of acid, and that quinine can stop it both before and after coagulation; that sodium nitropicrate has an action similar to, and nearly as powerful as, quinine, while the action of cinchonine is much less energetic. Harley has shown that while quinine lessens oxidation in blood, some substances, such as snake poisons, increase it. Binz found that when putrid fluids were injected into the circulation of an animal, the temperature rose; but that this increase of temperature could be more or less prevented by the addition of quinine to the putrid liquid, or the simultaneous injection of the quinine.

With respect to the influences of quinine on the change of tissue, Schulte gives the result of some careful experiments made by Zuntz, who found that after taking three 0·6 gram doses of hydrochlorate of quinine for two days the amount of urine he excreted was increased by one-third, and then decreased as much, the specific gravity falling from 1018 to 1012; the urea also showed a marked decrease.

* Neues Repertorium für Pharmacie, xx. 539.

SQUILL.

BY R. ROTHER.

The body called scillitin is the supposed active principle of squill; it possesses an alkaloidal character and combines with acids. In the native state it is soluble in alcohol and water; but the prodigious quantity of gum contained in the root and enveloping the principle renders strong alcohol inadmissible as a menstruum; water or weak alcohol is, therefore, the only available means by which the activity of the root can be perfectly exhausted. This menstruum dissolves the gum and with it the alkaloid. Hence any menstruum which does not completely dissolve the gum fails to extract the virtue of the root. The excessively large proportion of gum has always been an obstacle in the way of a concentrated preparation of squill, as also in the weaker aqueous preparations by reason of its fermentable quality. However, the acidulated preparations, as the vinegar and syrup of squill, are perfectly stable. If squill be macerated with water a few days, especially in a warm locality or during the summer weather, the infusion becomes sour. Gum, under the combined action of diluted acids and prolonged heat, is converted into glucose. When the sour infusion is evaporated, the acid converts the gum more or less completely into glucose, according to the duration of the action. Now if alcohol be added to the concentrated syrupy residue, which during the process has acquired a dark brown colour and sweet taste, very little if any gum will be precipitated whilst the sugar dissolves. A precisely similar result is obtained by the introduction of acetic or sulphuric acid in the beginning. An alcoholic menstruum, yet containing sufficient water to dissolve the gum, readily yields invariably a light-coloured residue, consisting of gum free from glucose, since the presence of alcohol has prevented the formation of acidity in the dilute infusion. This residue, when treated with strong alcohol, is converted into a doughy magma, of an utterly unmanageable nature. Therefore, to produce a concentrated preparation of squill as fluid extract, for instance, it becomes indispensably necessary to convert the greater part of the gum into glucose, in order to admit the presence of sufficient alcohol in the concentrated liquid to preserve it. The supposition would now seem valid, that the volatile acetic acid, above all others, would meet the indications. But this is not realized in practice; the requisite heat to expel all the acid remaining in the concentrated residue is destructive to the product. Sulphuric acid is more adaptable to the case, as this can be easily and completely removed with calcium carbonate. With sulphuric acid the concentration must not be carried so far as to cause injury through the instrumentality of the acid itself, as this would char the syrupy residue were it evaporated to the same extent as the acetic solution; it is, therefore, neutralized before even a very decided brown coloration has been imparted to the dilute liquor. The generated calcium sulphate, together with the excess of calcium carbonate, is removed by filtration, the filtrate carefully evaporated to the necessary limit, and then mixed with the required amount of alcohol. Acetic acid could be used as well, and even to advantage, if no objection be raised against the presence of the resulting acetate formed by neutralizing the acid with any desirable base after its catalytic action is no longer needed. When operating upon squill, it is always desirable to leave it in as coarse a condition as possible. The sliced root is often best; No. 12 powder is very convenient, and for purposes of extraction none should be finer than No. 20.

No preparation of squill should ever be made from the fluid extract.

Vinegar of squill is best produced from the sliced root by maceration; an insufficiency of water is first used with all of the acetic acid intended for the finished product, after due maceration the liquid is separated by means of a press, measured, and then as much water as will be necessary to complete the whole measure of the finished preparation added to the residue; after a short maceration this is also pressed out, the whole mixed together and filtered.

Syrup of squill should never be made by heat, as it is invariably clouded with flocculent matter, which has separated during the process. A bright and beautifully clear syrup will always be obtained when the sugar is dissolved in the vinegar of squill without heat. This is accomplished by first filtering the vinegar if necessary, pouring part of it upon the sugar to cause this to crumble, then adding the remainder, agitating frequently until the sugar is dissolved, and finally straining through muslin. The straining of cold syrups is best performed by placing a large square sheet of muslin upon a proportionately large funnel, then pouring on the syrup until the funnel is filled; by now folding any two opposite sides of the strainer together and twisting the ends in contrary directions, the syrup is rapidly forced through.

Compound syrup of squill can only be rendered permanent by the intervention of a small proportion of alcohol.

The seneka and squill entering into its composition can best be exhausted with a weak alcoholic menstruum. A portion of the alcohol should be expelled, and the dissolved albumen coagulated by slowly heating to the boiling-point, filtering after cooling, and dissolving the sugar and antimonial tartrate in the filtrate with heat. The process yields a product which meets every requirement, and is executed as follows:—

Take of Seneka root in No. 20 powder—
Squill „ „ „ of each 8 troy oz.
Sugar $76\frac{1}{2}$ troy ounces.
Antimonio-potassic tartrate 96 grains.
Alcohol,
Water, of each sufficient.

Mix one measure of officinal alcohol and 3 of water, pour three pints of this mixture upon the powdered roots and let macerate for twenty-four hours. Now place this into a cylindrical percolator forming a moderately low column, and pour on more of the menstruum until 4 or 5 pints of percolate has slowly passed; heat this slowly to the boiling-point and then evaporate to $3\frac{1}{4}$ pints, let cool, filter and in the filtrate dissolve the sugar and antimonial tartrate with heat, and strain through muslin while hot; the product measures 6 pints.

Fluid extract of squill is sometimes prescribed, and it is advisable for the pharmaceutist to prepare it himself, and always to have some on hand. For this purpose either the sliced root or the No. 12 powder can be used. The sliced root is treated by maceration, and the powder is percolated. The process with powder is as follows:—

Take of Squill, in No. 12 powder . .	16 troy ounces.
Sulphuric Acid	1 troy ounce.
Calcium Carbonate . . .	sufficient.
Alcohol	4 fluid ounces.
Water	sufficient.

Mix the sulphuric acid with 3 pints of water; pour the mixture upon the squill and let it macerate several days. Now place it into a cylindrical percolator, forming a low column, and pour on water until 4 pints of percolate has passed; evaporate this to 2 pints with boiling, and while hot add calcium carbonate in slight excess; filter; wash the residue in the filter with a small quantity of water; evaporate the whole filtrate to 12 fluid ounces, and then slowly pour in the alcohol with constant stirring and strain through muslin.—*Chicago Pharmacist.*

SYRUPUS ASSAFŒTIDÆ.

BY JOHN M. MAISCH.

Some years ago Mr. Richard Peltz proposed a syrup of assafœtida containing 15 grains of the gum resin in each fluid ounce, as a permanent substitute for the U. S. officinal mistura assafœtidæ, which in the course of a few days usually spoils. During the prevalence of whooping-cough, a few years ago, when assafœtida was often prescribed, I prepared a syrup, which was used by several physicians to their entire satisfaction, and which has kept well up to the present time. Instead of the boiling water used by Mr. Peltz, I have employed water at the ordinary temperature, and added some orange-flower water, which covers to some extent the odour of assafœtida, without masking it altogether.

Two drachms of selected tears of assafœtida are triturated with a sufficient quantity of water until three fluid ounces of emulsion have been obtained, to which half a fluid ounce of triple orange-flower water is added, and afterwards six troy ounces of sugar, which is to be dissolved by agitation without the aid of heat. It is important to perfectly emulsionize the assafœtida with the small amount of water, which, though more difficult than the preparation of lac assafœtidæ, is readily accomplished by judicious trituration with small portions of the water, and the removal of the concentrated emulsion, when trituration is continued with another portion.

The syrup thus prepared is whitish opaque and separates, on long standing, a portion of the resin like cream, which on occasional exposure to the air acquires a pinkish hue, and, subsequently, a deep pink colour: it can be readily mixed with the syrup by agitation. The change in the colour of the resin, of course, alters the appearance of the syrup in course of time, it becoming of a pinkish colour after the separated resin has again been diffused in it. An officinal preparation similar to the one described, it appears to me, would be by far preferable to the milk, since it is permanent, and affords an opportunity of combining assafœtida with other liquid medicines without much trouble.—*Chicago Pharmacist.*

NITRITE OF AMYL AND CHINESE SAMSHU.

Dr. F. Porter Smith writes to the *Practitioner* for January, with reference to "the effect of nitrite of amyl in causing flushing of the face, that Chinese 'samshu' (*i.e.* thrice distilled), or native corn-brandy, produces upon the people a remarkable reddening of the eyes and whole head, with a very evanescent excitement. This is due to the presence of fusel-oil (amyl-alcohol), and has exercised no small influence upon the drinking habits of the Chinese. The suffusion of the head and face immediately proclaims the fact of having drunk wine. The smell of the spirit, depending upon propylic and butyric as well as amylic compounds, acts as another tell-tale. Very strong and cheap spirit is easily obtainable in China, and may be used in the preparation of tinctures, due allowance being made for the presence of the amyl compound, which the Chinese distillers never remove by rectification. It acts like the salutary stink of gas, in giving timely warning of its near neighbourhood. Why remove fusel-oil from British brandy?"

The Pharmaceutical Journal.

SATURDAY, FEBRUARY 3, 1872.

Communications for this Journal, and books for review, etc., should be addressed to the Editor, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to Elias Bremridge, *Secretary,* 17, *Bloomsbury Square, W.C.*

Advertisements to Messrs. Churchill, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

LEGISLATIVE PROTECTION AGAINST POISONING.

Though we are loth to do anything calculated to revive a dispute which we hope has been irrevocably numbered with things that are passed away, we cannot refrain from recording here the opinion recently expressed by a leading medical contemporary in reference to the Brighton poisoning case. After reviewing the facts of that case, so far as they bear upon the question as to the sufficiency of the barriers placed by the law between an intending murderer and the poison by which the design is to be effected, the conclusion is arrived at that "no law, however stringent, can absolutely thwart a murderer;" and as the result of this the "sense of personal responsibility" is adopted as the really effectual safeguard, which no compliance with the requirements of the Poison Act can replace. This argument is by no means a new one; but we confess to some surprise at seeing it put forward emphatically by a journal which we have always regarded as a warm advocate of more vigorous legislative regulations on the subject of poisons, and we doubt not many will feel moved to congratulate our influential contemporary on the change of opinion now manifest.

In discussing the Brighton case it is admitted that the provisions of the Pharmacy Act were complied with, and that their failure to afford protection was due to the cunning of the criminal; but strange to say we have in the very same breath a confession of faith which reads almost like an involuntary condemnation of legislative protection, inasmuch as the obtaining of strychnine, avowedly in accordance with the law, is spoken of as "*a thing which we had hoped would have been rendered impossible by the Sale of Poisons Act of* 1868." The italics are our own; and we think the sentence reveals such an astounding state of mind on the part of the writer as to deserve such prominence.

Lamentably consistent with the above is the notion put forward by Mr. Garrett in commenting on the article from which the foregoing extracts have been taken, to the effect that it is desirable there should be a mitigation of the "responsibility resting upon druggists for the sale of poisons to careless persons or for criminal purposes." We cannot imagine any opinion on the subject of poisons more unfounded than this or more inconsistent with the true interests of the pharmacist. No doubt his responsibility is immense, but it is not by reducing it that he is to be benefited, and least of all can he seek such mitigation at the hands of either the press or the public. We sincerely sympathize with Mr. Garrett, in so far as he was the victim of deception, but we cannot object to the opinion of Mr. Serjeant Parry, that he was easily deceived, and we feel sure, from the general tenor of his letter in the *Times*, he will in future be more chary in supplying potent poisons, even in conformity with Act of Parliament.

But while we deprecate any mitigation of responsibility on the part of those who sell poison, we must equally deprecate the unjust censures from time to time passed on those who have strictly conformed with the law. On several occasions we have called attention to such cases in which it was apparent that ignorance of the provisions of the Pharmacy Act was the only basis for reprimands emanating from magistrates, coroners, and juries. That such a thing should be continued is a disgrace to the administration of the law no less than an injustice to those who suffer under it. In regard to this point we direct attention to a letter from Leeds, at p. 639, and we also take this opportunity of acknowledging the suggestion of a correspondent that a copy of the Regulations and Conditions to be observed under the Pharmacy Act should be sent to every coroner and magistrate in the country, a suggestion we have already made some months ago.*

PHARMACEUTICAL AFFAIRS IN AMERICA.

The dissatisfaction that we mentioned some weeks since † as existing among the pharmaceutists of New York with respect to the law recently imposed upon them by the Legislature, has led to some attempts on their part to draw up a Bill which, while securing the object in view, the security of the public, shall be more equitable in its relations to themselves. A joint committee had been appointed by the College of Pharmacy, the Apothecaries' Union, and the German Apothecaries' Societies, and this Committee has published the draft of a Bill that they recommend for adoption. It is satisfactory to notice that in this draft the principle of the English Act of 1868, which recognized the right of persons already engaged in the business to continue their occupation upon simple registration, but required that in future persons entering it should pass certain examinations, is adopted. An opinion has also been expressed that the safety of the public will best be secured by the increase of educational facilities, and

* Pharm. Journ. p. 348.

† *Ante*, p. 390.

that to this end expensive boards of examiners and exorbitant fees should be abolished, that the examining power should be confided to those who have hitherto endeavoured to promote such education, and that the pecuniary benefit should be received by the pharmaceutical colleges.

The Bill proposes to recognize four grades on the Register,—(1) "Graduates in Pharmacy," those who have had four years' experience in the compounding of prescriptions of medical men, and who possess a diploma from a college of pharmacy within the States, or from a recognized foreign institution or examining board; (2) "Licentiates in Pharmacy," those who have had four years' experience in dispensing prescriptions, and pass an examination before the Board of Pharmacy, or foreign pharmacists presenting satisfactory credentials of their attainments; (3) "Practising Pharmacists," those in business at the passing of the Act; (4) "Practising Assistants," who are not less than eighteen years of age, and have had two years' experience. Persons less than eighteen years of age are, as "junior assistants or apprentices," to be under the immediate supervision of a registered "pharmacist," or "assistant pharmacist," until they have become "graduates" or "licentiates."

The poison schedule is divided into two parts which are subject to the same regulations as those in the English Act, but the substances mentioned in them differ. Thus Aconite and its preparations, Cantharides, Ergot, and Savin, contained in part 1 in the English Act are placed in the second part in this Bill; Emetic Tartar is omitted altogether, while White and Red Precipitate, Biniodide of Mercury, Essential Oil of Bitter Almonds, and Opium and its preparations, except Paregoric, and other preparations, containing less than two grains of opium to the ounce are placed in the first part. In addition, Colchicum, Conium, Nux Vomica, Henbane, Cotton-root, Digitalis, and their pharmaceutical preparations, Croton Oil, Chloroform, Chloral Hydrate, Sulphate of Zinc, the Mineral Acids and Carbolic Acid are proposed to be subjected to the restrictions of Part 2.

Chicago gives fresh proof of its vigour and enterprise in the reappearance of the *Pharmacist*, to which we gladly give welcome. It has seldom fallen to the lot of a journal to be burnt out twice in thirteen months, yet this has happened to our contemporary. On the last occasion so complete was the destruction that only the office file of the journal was saved.

We take the opportunity of reminding our readers that the first Evening Meeting for the present year will be held on Wednesday next, at 8.30 P.M. A list of the Papers to be read will be found among the notices on the front page of this Journal.

Transactions of the Pharmaceutical Society.

EXAMINATIONS IN EDINBURGH.

January 23rd, 1872.

Present—Messrs. Ainslie, Aitken, Buchanan, Gilmour, Kemp and Young.

PRELIMINARY.

A certificate was received from the undermentioned in lieu of this Examination:—

Dewar, Michael .... Glasgow.
(*Certificate of the Edinburgh University.*)

MINOR.

Four candidates presented themselves for the Minor examination; of these, *two* failed. The following *two* passed, and were declared duly qualified to be registered as Chemists and Druggists:—

Equal. { Christie, James .... Aberdeen.
{ Fraser, Alexander .... Forres.

MODIFIED.

Seven candidates presented themselves for the Modified examination; of these, *five* failed. The following *two* passed, and were declared duly qualified to be registered as Chemists and Druggists:—

Hall, Samuel .... Littleborough.
Roberts, Henry .... Collingham.

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

The Sixth General Meeting was held at the Royal Institution, on the 18th of January; the President, Mr. E. Davies, F.C.S., in the chair.

Mr. N. P. Williams was elected a member of the Association.

The following donations were announced:—'The Year-Book of Pharmacy;' current numbers of the 'Pharmaceutical Journal' and the 'Chemist and Druggist;' 'New York Druggists' Circular' for December;' and a number of copies of 'Hints to Apprentices and Students' for distribution among the associates.

Mr. A. H. Mason, F.C.S., exhibited a specimen of crotonic chloral-hydrate, described its formation, its probable therapeutic value, and gave preliminary notice of the results of some experiments in connection with its use in pharmacy.

Mr. A. Norman Tate read a paper on "Chemistry and Commerce."

The object of this paper was to point out that, although such great benefits had already been derived by commerce from chemistry and other sciences, yet that to most persons engaged in commerce scientific knowledge is something almost unknown. Most of the various articles that pass through the hands of merchants, brokers and others are scarcely ever examined scientifically, and are often sold and bought without their real practical working value being in any way assessed, except by eye or touch, or sometimes by smell or taste. Yet the value of many articles cannot possibly be assessed in this way. Instances were given referring to pharmacy, such as the purchase of Peruvian bark, opium and articles of a like character, the real value of which cannot possibly be ascertained without a proper assay of the amounts of active constituents. The same could be said of dye-woods, weeds, etc., and of tanning materials and many other articles.

In addition to further individual study of chemistry and other sciences bearing upon their business, the reader of the paper considered that much good might be done by trade associations establishing agents or correspondents in different parts of the world, whose duty it should be to search out and forward new materials likely to be useful, and that these articles might then be carefully examined, and their value practically ascertained. The Pharmaceutical Society might, for example, do something in this way, in order to discover and bring into use new materials useful in pharmacy.

An animated discussion on some of the topics alluded to in the paper followed, in which the PRESIDENT and Messrs. REDFORD, MASON, SHAW and the SECRETARY took part; and Mr. TATE replied to the several remarks made.

Mr. REDFORD referred to the subject of ships' medicine chests, upon which the PHARMACEUTICAL JOURNAL had published an article in last week's issue. He thought that, as far as the Liverpool emigration traffic was concerned, there was efficient protection against adulteration. Every emigrant ship leaving the port with fifty passengers had a medicine chest, which was inspected and sealed up by a medical officer before being put on board. Two such medical inspectors were attached to the Emigration Department, one of whom was also analytical chemist to the Board of Trade. Mr. REDFORD believed that medicine chests for merchant ships were not so inspected.

The meeting terminated with a vote of thanks to Mr. Tate for his interesting paper.

MANCHESTER CHEMISTS' ASSISTANTS' ASSOCIATION.

The ordinary (fortnightly) Meeting was held on Tuesday, January 23rd; the President in the chair.

A paper was read by Mr. CARTER on "Carbolic Acid and the Carbolates."

The reader briefly alluded to the rapid rise into favour this substance has obtained, and to the fact of its being considered a universal disinfectant; also its mode of preparation and the various combinations with bases, as soda and lime, to form salts, with their properties and uses.

The next meeting will occur on February 6th, 1872, when Mr. ARKLE will read a paper entitled "Notes."

LEEDS CHEMISTS' ASSOCIATION.

The Fourth Meeting of this Society was held in the Library on Wednesday, January 24th, 1872; Mr. JAMES ABBOTT in the chair.

The minutes of the former meeting having been read and confirmed, Messrs. F. F. Walbran, J. T. Adams, and J. Stephens were elected Associates.

Mr. E. THOMPSON read the paper of the evening, entitled, "Dr. Black, and the Chemistry of his Time."

The lecturer began by remarking on the interest of comparing the state of science at one period with its condition at another; but he admitted that the chemistry of a hundred years ago was so different from the comprehensive science of the present day as to be hardly recognizable as the same thing.

Dr. Black lived between 1728 and 1799. He was of a Scotch family, settled at Belfast, but he was actually born at Bordeaux, where his father carried on the business of a wine-merchant. At twelve years of age he was sent to Ireland, and at eighteen to the University of Glasgow, for his education. After some time he made choice of medicine as his profession, and devoted himself with diligence to the study of those branches of science which were necessary to form the accomplished physician. Dr. Cullen was then at Glasgow, and though afterwards famous for practice of physic and nosology, he was then a zealous professor of chemistry. He was trying to prove that chemistry was a science as well as an art, and young Black could not help sympathizing with an effort which accorded so well with his own enlarged habits of thought. Dr. Cullen took great interest in the progress of his promising pupil, and employed him to assist in performing experiments.

In 1750 or 1751 Mr. Black removed from Glasgow to the University of Edinburgh, and entered upon some investigations into the nature of quicklime and magnesia, which resulted in important discoveries. It had before been crudely imagined that caustic alkalies owed their acridity and their supposed power of dissolving the stone in the bladder to the quicklime with which they were made, and this again owed its acridity to the fire in which it was burned. Our young student imagined that by some means or other, he could catch the causticity, or fire, as it escaped into the air during the time when the lime was passing from its caustic to its mild state. But he found that nothing did escape; on the contrary, the lime became heavier. He went on to discover that air was absorbed; not common air, but, as he called it, a "peculiar kind of air." He pursued similar researches on magnesia, and made an account of his investigations serve as the substance of his 'Inaugural Thesis,' an essay in Latin, which all were obliged to write on graduating, either at Glasgow or Edinburgh.

When Mr. Black took his degree, therefore, it was more as an advanced philosopher than as a raw student; and, young as he was, he was well prepared to undertake the duties of a teacher. About this time, that is in 1756, Dr. Cullen removed from Glasgow to Edinburgh, leaving the post of Professor of Chemistry and Anatomy at the former place vacant, to which Dr. Black succeeded, but soon afterwards exchanged his anatomy for medicine. He, therefore, gave regular courses of lectures on chemistry and on the theory and practice of medicine.

Dr. Black had an amiable disposition, great simplicity and elegance of manners, a thorough knowledge of his profession, and a conscientious care for the well-being of his patients, so that he obtained a considerable practice in medicine at an early period of his life, which he seems to have continued till near its close; and this circumstance might partly account for the quietness and want of ambition with which he pursued his chemical discoveries.

The lecturer then proceeded to explain, at some length, Dr. Black's discoveries on the subject of latent heat, showing the imperfect notions that prevailed before his time respecting liquefaction and vaporization, and giving due credit to the help that Dr. Black received in his investigations from James Watt, then a young man just commencing business near the College of Glasgow, and making his first efforts towards improving the steam engine. Thus, while Black was engaged in a theoretical investigation respecting the mutual relations of heat and steam, Watt devoted himself to the more practical question how steam and atmospheric pressure might be made available as a mechanical power; and yet neither of these philosophers probably at that time had any idea of the vast application of their inventions to manufactures and locomotion.

The state of chemistry in Dr. Black's time was illustrated from 'Black's Lectures,' 'Nicholson's Chemistry,' and a course of lectures on chemistry, by Dr. Webster, a contemporary and rival of Dr. Black at Edinburgh, delivered in 1785, a MS. report of which was in the possession of the lecturer. It was remarked that a hundred years ago and long before, some ideas were broached which were nearly identical with the more precise conclusions of modern times, as, for instance, respecting "heat as a mode of motion" and not a material substance, and concerning the identity of the forces of heat and electricity, magnetism and gravitation, as shown in recent investigations on the "correlation of physical forces." A remarkable passage to this effect was quoted from a MS. volume of Black's Lectures, which was omitted in Professor Robinson's printed edition, apparently because Dr. Robinson thought all such speculations erroneous.

The lecture was concluded by an account of Dr. Black's later years and peaceful death.

A very interesting discussion followed the reading of this paper, in which the Chairman, Messrs. F. Reynolds, S. Taylor, E. Yewdall and others took part, and upon the motion of Mr. F. Reynolds, seconded by Mr. Hardman, a cordial vote of thanks was given to Mr. E. Thompson.

Proceedings of Scientific Societies.

PHILADELPHIA COLLEGE OF PHARMACY.

At the meeting of the Philadelphia College of Pharmacy, on December 19, 1871, Professor Parrish called attention to the new excipient for making pills, introduced by Mr. J. B. Barnes at a recent meeting of the Pharmaceutical Society of Great Britain—soluble cream of tartar; bitartrate of potash in a solution of borax, inspissated to the consistence of mucilage. He also showed pills of Dover's powder, of sulphur, and of chloral hydrate, made with it and minute quantities of tragacanth. Those of chloral hydrate, though round and firm, are covered with crystals, they are necessarily kept in a vial.

In allusion to the difficulty of making salts of iron, especially sulphate, into pill, owing to the crumbling of the mass, Professor Parrish mentioned that if a paste of dextrine is used as the excipient, there is no difficulty in making a perfectly plastic mass; he exhibited pills of dried sulphate of iron, each containing three grains, very nearly equal to five grains of the crystals made with dextrine; they were of convenient size. He remarked that when this mass crumbles it is from a deficiency of water, and when water is again added it becomes quite plastic, though it is more bulky on each addition of water. The soluble tartar excipient does not appear well suited to this salt. Mr. Robert England expressed a preference for manna as an excipient in making difficult masses. Dr. Pile and others use a mixture of tragacanth and glycerine with satisfactory results.

Some fine specimens of bicarbonate of soda in powder and pseudomorphic masses from the Pennsylvania Salt Works at Natrona were exhibited with a letter from the manager of the works, a former graduate of the College, stating that a single charge of the carbonating chamber from which they were taken amounted to 525,000 lbs.

ACADÉMIE DES SCIENCES.

M. PASTEUR ON FERMENTATION.

At the sitting of the French Academy, on Monday, December 18th, a note was presented by M. Pasteur in reply to some statements made in Baron Liebig's memoir on fermentation, a translation of which has already appeared in our columns.* Remarking that this memoir appeared to be a profound criticism of some of his own observations, and that he was unable, from want of leisure, to follow it step by step, M. Pasteur expressed his intention of dealing specially with two negations in which were concentrated all the objections of the German chemist, and which went to the root of the question. The following is an abstract of M. Pasteur's argument:—

In the first of these two negations Baron Liebig had formally contested the production of beer yeast and alcoholic fermentation in a saccharine mineral medium, where an extremely small quantity of yeast had been sown. This, in effect, was the touchstone of the truth. M. Liebig, as was known, looked upon fermentation as a phenomenon correlative, so to speak, with death. According to him, all substances, especially those known as albuminoids,—albumen, fibrine, caseine, etc.—or the organic liquids containing them,—milk, blood, urine, etc. —have a property that is developed by exposure to the air of conveying movement to the molecules of fermentable matter. This matter is then resolved into new products, but without anything being taken from, or imparted to the substances causing the change. M. Pasteur, on the contrary, looked upon all fermentation, properly so called, as correlative with life, and he claimed to have proved that fermentation never goes on without an incessant interchange between the living cells which grow and multiply, and the fermentable matter which they partly assimilate. While the doctrine of Baron Liebig was in full favour, he had shown, in the first place, that in all real fermentation there were necessarily present special organisms, and that in what had been looked upon as dead albuminoid matter life appeared correlative with fermentation, the two phenomena commencing and terminating at the same time. In the second place he had shown that fermentation would become impossible even in free contact with air, the sole condition being that the air should be prevented from carrying to the fermentable matter the organic germs that are continually present in it in the neighbourhood of the earth's surface. To illustrate this point, he called attention to some infusion of hay that had been placed in an open vessel in 1864, which still remained limpid, and free from any trace of fermentation or putrefaction, only because the neck of the vessel had been so bent that dust was prevented from reaching the surface of the liquid. The same result followed when the hay infusion was replaced by other fermentable liquids. But if some of the dust that covered the outside of the vessel was brought into contact with the liquid, various changes or fermentations proceeding from the living cells, carried in with the dust, would appear after a few days. Nevertheless it has been satisfactorily proved that where fermentable liquids are prevented from fermenting by exclusion of the suspended germs, they undergo a perceptible oxidation and chemical alteration in the presence of the pure air.

M. Pasteur said he prepared fermentable media in which but three kinds of substances existed,—the matter capable of fermentation, mineral salts suitably chosen, and the germs of ferment. For example, he had found that the ferment of lactate of lime was a vibrion. To a solution of very pure crystallized lactate of lime he had added the phosphates of ammonia, magnesia, and potash, small quantities of sulphate of ammonia, and lastly the vibrion either in the germ state, or fully developed. After some days' interval, the lactate had entirely disappeared, and an infinite multitude of vibrions had made their appearance. As long as any lactate remained the vibrions multiplied, and were active in the liquor, but as soon as it was all decomposed they fell dead to the bottom of the vessel. The other fermentations, and the ferments peculiar to them, give the same result, especially with beer-yeast. In this particular branch of the investigation great care is required; repeated experiments are necessary, as other organisms may intervene and prevent the development of the ferment that has been sown. Certain infusoria, the lactic ferment, and various other organisms find their appropriate nourishment in the mineral medium, and may more or less prevent alcoholic fermentation. M. Pasteur thinks that these are the difficulties that Baron Liebig has been unable to overcome; but he considers that the obstacles themselves are fresh proofs of the truth of his conclusions, —the production of the lactic ferment in a saccharine mineral medium having the same signification, in a general point of view, as the production of beer yeast.

M. Pasteur next proceeded to deal with the second negation of Baron Liebig, in reference to acetic fermentation. Pointing out that he was the first to esta-

* See 3rd Ser. Vol. I. pp. 61, 81, 101, 122, 141.

blish a complete theory of acetification which has been carried out practically in a new and successful industry in the manufacture of vinegar, he proceeded to state the principle upon which that is based. Whenever wine is transformed into vinegar it is by the action of *Mycoderma aceti* developed upon its surface. He did not believe that there existed in any country, a single drop of wine, acidified spontaneously in contact with air, unless the *Mycoderma aceti* had been present previously. This microscopic vegetation has the faculty of condensing the oxygen of the atmosphere in a similar manner to platinum black or blood globules, and carrying it to subjacent matter. In what is called the "German process" the chips of wood or pieces of charcoal that are placed in the acetification-casks are but supports of the *Mycoderma aceti*, and do not, by their porosity, intervene in the chemical action, as was believed previously to the publication of his memoir.

The correctness of this view is formally denied by M. Liebig, who says that the elements of nutrition of the *Mycoderma* are excluded from the dilute alcohol used in making vinegar, which is produced without its intervention. He also states that he has consulted M. Riemerschmied, the head of one of the largest and best conducted manufactories of acetic acid in Germany, who has informed him that the diluted alcohol receives no admixture during its transformation, and that except the air and the surfaces of the wood and charcoal nothing can act upon the alcohol, and that he does not believe in the presence of the *Mycoderma aceti*. Finally, M. Liebig states that he himself has been unable to detect any trace of it in wood shavings that have been used in the manufacture twenty-five years. In answer to this apparently conclusive argument, that a plant necessarily containing mineral elements could not be developed in a medium not containing them, and to another in which it was imputed that he had claimed to produce beer-yeast, which contained sulphur, in a medium from which that element was absent,*—M. Pasteur replied, that in the former case the alcohol was diluted with ordinary water which contained all the mineral elements necessary to the life of the *Mycoderma aceti*, and that in the latter the yeast-ashes used as a mineral medium contained sulphates.

As a method of testing the truth of the respective theories, M. Pasteur proposed that Baron Liebig should name one or more members of the Academy, in whose presence, and with substances furnished by Baron Liebig himself, he would repeat the two chief experiments, the truth of which had been contested. He would prepare in a mineral medium as much beer-yeast as could reasonably be required, provided M. Liebig bore the expense. Upon the same condition he would prepare a few kilograms of vibrion flesh, of which all the carbon, nitrogen, sulphur, phosphorus, and cellulose and fat matters should be obtained from a medium of crystallizable mineral substances and fermentable organic matter. As to the presence of *Mycoderma aceti* on the beech shavings, if M. Liebig would obtain some from the manufactory referred to, dry them quickly in a stove, and send them to Paris, he would engage to demonstrate the presence of the mycoderm on the surface of the shavings. Another suggestion he made was that M. Riemerschmied should fill one of his vats which had been in use for some time with boiling water for half an hour, allow it to cool, run the water off and resume operations. According to M. Liebig the fermentation would go on just as before; but he (M. Pasteur) affirmed that no more vinegar would be produced until, at least, sufficient time had elapsed for a fresh growth of mycoderms to appear on the shavings, for the boiling water would have killed all the old fungus.

The President (M. Faye) proposed that the Academy should engage to bear the expense of the experiments necessary for the solution of the questions raised, and the proposition was agreed to.

M. Fremy said that for many years he had studied this subject, and that in 1841, a time when M. Pasteur had scarcely entered the scientific world, he had, in conjunction with M. Boutron, published a memoir on "Lactic Fermentation." They had shown that in this fermentation, by which they meant the production of lactic acid in soured milk, it is the sugar of milk which is the fermentable element; the ferment, which was very different from yeast, and which they called the lactic ferment, being derived from the caseous matter. They had thus clearly distinguished between alcoholic and lactic fermentation. They had also established that fermentation was not confined to sugar in the presence of yeast, but extended to many other organic bodies. The same ferment would not cause different fermentations, each fermentable substance requiring a special agent; but the same albuminous substance could form, according to circumstances, different ferments; thus caseine produced equally alcoholic, lactic and butyric ferment. Their views were very different to those of M. Pasteur, as they considered that yeast had its origin in the decomposition of albuminous matter, while he maintained that it was produced by germs. M. Fremy said that he had pointed out to M. Pasteur that the juice of the grape, carefully filtered and quite clear, undergoes fermentation when exposed to the air, and produces a considerable quantity of grains of yeast, and had asked him to explain the presence of alcoholic fermentation under such circumstances. M. Pasteur had replied that it was due to the germs of yeast that existed in the air falling into the juice. But this presupposed that the air contained so large a quantity of yeast germs that, in any locality, when the juice was exposed to the air, that moment a germ fell into it and caused it to ferment. M. Pasteur had stated that germs of yeast could develope in a liquor consisting of sugar, phosphates and ammoniacal salts. Such a solution, therefore, exposed to the air, should undergo fermentation by contact with the germs contained in it; but he had not been able to recognize alcoholic fermentation in such a mixture,—a result that M. Pasteur attributed to the formation of some other fermentation which prevented the production of the yeast.

M. Pasteur replied that the development of beer-yeast in a saccharine mineral medium, where it had been directly sown, was a very delicate experiment, since such a medium was more suitable to the production of various other organisms. To repeat the experiment without the direct sowing of the yeast-germs he compared to an attempt to grow corn in land covered with other plants, the soil of which was favourable to those plants and not to corn. M. Fremy demanded the solution of a problem that he himself was the first to propose in the following terms, "To find a saccharine mineral medium that would be as suitable to the production and development of the alcoholic ferment as the natural must of the grape itself." This problem is not insoluble, but it would require long research. But one ferment was as good as another to prove the truth of the theory, and the results that he had obtained with the lactic, butyric and various other fermentations ought to be sufficient evidence of the truth of the theory. He denied that he had ever said, as represented by M. Fremy, that atmospheric air contained so great a quantity of yeast-germs; that, in all localities, when the juice was exposed to the air, that moment a germ fell into it and caused fermentation. On the contrary, he had demonstrated with an exactness which had not been contested that all the germs—either of yeast or of other organisms on the surface of the fruit or wood, and those that were floating in the air during the manipulation or were present on the sides of the vessels used—were forcibly introduced into the juice in the grape vats. He concluded by denying (1) that caseine will produce equally alcoholic, lactic and butyric ferment, or

* Pharm. Journ. 3rd Ser. Vol. I. p. 103.

(2) that in the production of wine it is the juice of the fruit which, in contact with the air, produces the grains of yeast.

ROYAL INSTITUTION.

On Friday evening, January 14th, a lecture on "The New Metal Indium," was delivered by Professor Odling, at the London Institution. He stated that previous to Lavoisier's time it was not known that terrestrial matter could be resolved into certain distinct elementary substances, neither of which was capable of being converted into one of the others. Twenty-four of these elements were known to chemists before the discovery of hydrogen, and thirty-four more have been added to the list at various intervals since that time. Indium, the last discovered, was found by Reich and Richter in the year 1863, and as for the last fifty there has, on the average, been one fresh element noticed every four years, more than the usual time has elapsed since the last discovery. Probably the list of elementary substances is capable of great extension, but it is not likely that any very commonly occurring ones remain, the latest found being of extreme rarity, and, although sometimes widely distributed, to be detected only in very small quantities.

Indium was discovered by Reich and Richter in some zinc blend, or black jack, from the Harz mountains. Its spectrum contains two lines only, of a bright indigo colour, one situated in the blue and the other in the indigo portion of the spectrum. The metal is white, but tarnishes rapidly on exposure to air, when it exactly resembles tarnished lead, but differs in the peculiarity that the film of tarnish may easily be rubbed off with a cloth. Indium is very compact and soft, and is easily pressed into wire. Its weight is nearly that of tin, the sp. gr. of tin being 7·3, indium 7·4, and lead 11·9. It is very fusible, and may be melted in hot spermaceti at 176° C.; tin melts at 228° C., and cadmium 278° C. Its combining ratio is 38, and its atomic weight 38.

Parliamentary and Law Proceedings.

Mysterious Case of Poisoning.

An inquiry is being held at North Cray into the circumstances attending the death of Emma Smith, aged 16, who died after a day or two's illness under suspicious circumstances, resulting in the stomach being forwarded for analysis to Professor Rodgers. That gentleman stated that he found the stomach intensely inflamed, the appearances quite warranting the suspicions of Dr. Allfrey, who made the *post-mortem* examination in the first place, and came to the conclusion that some irritant poison had been administered. The contents of the stomach showed indications of a poison, possessing the properties of white hellebore. He could not determine in what form the poison was taken. Hellebore was sold in the form of a powder, and was used by veterinary surgeons. It was a powerful irritant, and would cause vomiting and great pain. It took effect very quickly, and the bodies of those dying from it would be exceedingly stiff. Half a grain to three-quarters was sufficient to cause death. Veratria was the active principle of hellebore, veratria being to hellebore what quinine was to Peruvian bark. White hellebore could be obtained of herbalists and veratria of chemists. There would be no difficulty in getting as much hellebore of herbalists as would kill; in fact any quantity could be procured. White hellebore was used to poison birds, and might be taken in ignorance to procure abortion.

The Coroner said that hellebore was sometimes mistaken for wild celery, and he had held an inquest at Woolwich in which thirteen or fourteen persons had made a mistake in that way in Plumstead marshes. Deceased's mother had a garden, but she did not know that there was any white hellebore in it. He advised the police to make diligent inquiry amongst the chemists and herbalists within a moderate range, and to ascertain whether white hellebore grew in the locality. The inquiry was then adjourned for a fortnight.—*Daily News.*

The Alleged Poisoning of a Medical Officer.

On Thursday, January 25th, Hannah Steel was brought up at the Manchester City Police Court, charged on remand with having caused the death, by poison, of Mr. Andrew Harris, late resident senior surgeon at the Manchester Workhouse.

Professor F. Crace Calvert said that since the previous Thursday he had examined various matters placed in his hands by Inspector Henderson, so far as he deemed it advisable. The result of his analysis was, that in the blood from the heart of the deceased he distinctly discovered atropia. In the contents of the stomach he also found the poison. There was poison in milk which was left in the cream jug. He did not find atropia in the tea, or in the tea leaves. In the deceased's wine poison was discernible. The first vomit of Margaret Lythgoe contained atropia, and the second did also. Clarke's vomit, too, showed a distinct quantity.

Mr. Cobbett, in a speech on behalf of the prisoner, reviewed the evidence which had been given, not one particle of which, he said, in any way showed that she was guilty. With respect to the threat she was said to have used, to the effect "that before the week was out she would give Mr. Harris plenty of reporting," that only meant that in future—taking into consideration that she had been reported by him, having failed to report a certain case—she would be careful to report everything at once without any care for his comfort and convenience. He submitted that no intelligent jury would entertain such evidence as had been adduced, and expected the magistrates to dismiss the case.

In reply to the charge, the prisoner said she knew nothing of the affair until her husband told her of it after 1 o'clock. The prisoner was committed for trial at the assizes.

Unqualified Medical Practitioners.

Yesterday (January 31st) Mr. Humphreys held an inquiry at the 'Red Cow,' Mile End Road, into the circumstances under which Edward Davis, aged one year, came by his death.

Elizabeth Davis, of 20, Belle-Vue Terrace, Mile End, said, "The deceased was my son. He had been ailing for some time, and I called in a chemist to attend to him, and he has been attending and prescribing for some time past, charging 6*d.* a visit. I always thought he was a regularly qualified doctor, and he never told me otherwise. The deceased gradually got worse, and at last was so bad that I became dissatisfied, and on Friday evening called in Dr. Riley, but deceased died the next morning."

Dr. Riley said, "I was called to see the deceased on Friday evening, and found him suffering from congestion of the lungs. He died the next day, having been too far gone when I saw him for me to render him any assistance. If I had had the case a few days before I dare say he might have survived, as he was a healthy, well-nourished child."

The coroner, addressing the jury, said, "Unfortunately this is a sample of many inquests which I have to hold, for chemists openly defy the law, thereby endangering the life of the patient. There is no earthly reason why this child should not have grown up to manhood. Some active steps ought at once to be taken to abate this evil, and I sincerely trust that the press will help to expose it."

The jury returned a verdict of "Death from natural causes," and expressed their hearty concurrence in the opinions expressed by the coroner.—*Morning Advertiser.*

Reviews.

THE HALF-YEARLY ABSTRACT OF THE MEDICAL SCIENCES. Edited by WILLIAM DOMETT STONE, M.D., F.R.C.S. Vol. liv. July to December, 1871. London: J. and A. Churchill. 1872.

The half-yearly issue of this well-known work contains, as usual, short abstracts of the most notable productions in medical literature during the past six months. Although compiled more especially for the use of the medical practitioner, the pharmaceutist who tries without too much study to keep himself informed of the principal points in the history of therapeutics as they arise, will find the brief epitomes in this and similar volumes of great service. Especially does this remark apply to the section on "Forensic Medicine," where some toxicological extracts are to be found, and that on Therapeutics, containing information in reference to condurango, chloral hydrate, and other comparatively novel remedies.

THE PRINCE'S ILLNESS: ITS LESSONS. A Lecture on the Prevention of Disease. By BALTHAZAR W. FOSTER, M.D., M.R.C.P. London: J. and A. Churchill. 1872.

In a pamphlet form Dr. Foster has issued a lecture that he delivered recently before a local association, in which he endeavoured to enforce the sanitary lessons to be learnt from the prince's illness. He has not, however, confined himself to that particular instance, but has illustrated the subject by the discussion of the death-rate at Birmingham, and outbreaks of fever in different parts of the country. It is much to be desired that such information as that contained in this pamphlet should be circulated, to assist in inducing the public to consider how greatly zymotic diseases might be diminished by simple sanitary precautions.

MEETINGS FOR THE ENSUING WEEK.

MONDAY, Feb. 6. ......*London Institution*, at 4 P.M.—"Elementary Chemistry." By Professor Odling.

TUESDAY, Feb. 6. ......*Royal Institution*, at 3 P.M.—"On the Nervous and Circulating Systems." By Dr. Rutherford.

WEDNESDAY, Feb. 7. ...*Pharmaceutical Society of Great Britain*, at 8.30 P.M.—Evening Meeting.—"Note on Tincture of Cinnamon," in connection with Mr. Haselden's paper read at the last meeting. By Mr. Greenish.—"Note on the 'Longouze' of Mauritius." By Daniel Hanbury, F.R.S.—"The Separation and Quantitative Determination of the Different Cinchona Alkaloids." By Dr. J. E. De Vry. "*Samadera indica*." By Dr. J. E. De Vry.
Society of Arts, at 8 P.M.—"The Forests of England, their Restoration and Scientific Management." By T. W. Webber, Esq.
Royal Microscopical Society, at 8 P.M.—Annual Meeting.

THURSDAY, Feb. 8. ......*Royal Society*, at 8.30 P.M.
Royal Institution, at 3 P.M.—"The Chemistry of Alkalies and Alkali Manufacture." By Professor Odling.

FRIDAY, Feb. 9. ....*Royal Institution*, at 9 P.M.—"Sleep." By Professor Humphrey.
Quekett Club, 8 P.M.

SATURDAY, Feb. 10. ......*Royal Institution*, at 3 P.M.—"The Theatre in Shakspeare's Time." By W. B. Donne.
Royal Botanic Society, at 3.45 P.M.

The following journals have been received:—The 'British Medical Journal,' Jan. 27; the 'Medical Times and Gazette,' Jan. 27; the 'Lancet,' Jan. 27; the 'Medical Press and Circular,' Jan. 31; 'Nature,' Jan. 27; the 'Chemical News,' Jan. 27; 'English Mechanic,' Jan. 26; 'Gardeners' Chronicle,' Jan. 27; the 'Grocer,' Jan. 27; the 'Journal of the Society of Arts,' Jan. 27; the 'Educational Times' for February; 'Journal of Materia Medica' for November; 'Répertoire de Pharmacie' for December.

Notes and Queries.

*** *In order to facilitate reference, correspondents are requested to mark their answers in each case with the title and number of the query referred to.*

No notice can be taken of anonymous communications. All queries or answers should be accompanied by the name and address of the writer.

[295.]—SOL. ACID. CARBOLIC. AROMAT.—Your correspondent *J. A. S.* will, I think, find his reply in the ninth page of the advertiser of the Journal of Jan. 6th.—L. HOOPER.

Solut. Acid. Carbolic. Aromat. is prepared by R. M. Rew and Co., 282, Regent Street, London. Put up in various sized bottles for retailing, larger ones for convenience of dispensers.

[297.]—CHEMICAL FLY-PAPER.—In answer to *Nil Admirari's* request to be supplied with a receipt for making Chemical Fly-Paper, a correspondent has sent us the following cutting from a newspaper:—"A newly invented fly-paper in Titusville, Pa., is covered with nitro-glycerine, glue, and molasses. The flies, attracted by the molasses, alight, and are stuck fast by the glue. Should any get away, they proceed to rub their legs together in ecstasy, when the friction of their own shins causes the nitro-glycerine adhering to their feet and limbs to explode, blowing them to atoms." We have had no experience of the efficacy of the preparation.

CHILBLAINS.—A correspondent recommends the use of a solution of nitrate of potash,—a scruple to an ounce of water,—applied with a piece of lint, for chilblains.

REMEDY FOR DANDRIFF.—Mr. J. L. Davis states, in the *American Journal of Pharmacy* (4th ser. vol. xliv. p. 6), that, having tried many preparations for the removal of dandriff without success, he was led to adopt the plan of cleansing the scalp with borax and carbonate of potash. Under this treatment the dandriff was removed, but the hair became sensibly thinner. He therefore tried a preparation made by agitating repeatedly, at intervals of a few hours, one ounce of flowers of sulphur with one quart of water, and decanting the clear liquor. With this the head was saturated every morning, the result being that in a few weeks the hair became soft and glossy, and the disease was eradicated. Sublimed sulphur being practically insoluble in water, and the liquor being free from taste, colour and smell, Mr. Davis does not pretend to explain the operation of the remedy.

[300.]—MEDICINAL ROOTS IN SPAIN.—Can any one inform me what are the medicinal roots included amongst the imports into Spain, under the following names:—"Forment," "Bur," "Jet Wall" and "American Cissampelos"? See Newdegate's 'Tariffs of all Nations,' p. 73.—C.

[301.]—WHITE MARBLE COUNTERS.—A correspondent asks whether white marble counters, such as are sometimes used both in this country and America, are found to keep their colour, as a rule, for any great length of time.

[302.]—AUSTRALIAN FEBRIFUGE.—Can any reader inform me what is the composition of "Australian Febrifuge"? Answer will much oblige.—M. P. S.

[303.]—TINCTURA ALOES CUM CANELLA.—Would some reader favour me with a formula for this tincture?—"VINCIT AMOR PATRIÆ."

[304.]—MOSSES.—Can any correspondent inform me the best way to abstract the colour (so as to preserve it) from some moss?—G.

Correspondence.

**** No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

PHARMACEUTICAL EXAMINATION.

Sir,—Will you kindly permit me to reply to the comments which your correspondent, Mr. Benjamin Keen, has made upon my lecture. Mr. K. begins by stating that my lecture abounds with absurdities and inaccuracies, but he makes no attempt whatever to prove his assertion; and all he has to say against my statements is, that he, for one, thinks otherwise, or that he, for one, would be sorry to agree with me. I do not know Mr. Benjamin Keen, and cannot tell how far the opinion of your readers may be impressed by the mere fact that he, for one, thinks so or so; but I am quite sure that the use of such terms as "absurdities" and "inaccuracies," unless supported by a very different kind of argument, reflects little credit on their author. In alluding to my remarks on practical pharmacy, Mr. K. complains that I ignore the B. P. altogether, and he therefore considers them as so absurd as to be almost beneath one's notice. That my remarks on practical pharmacy have really been quite beneath his notice is very evident, for if he had but read them he would have found that I recommend the B. P. to the student as the text-book on that subject.

There is only one single point on which Mr. K. ventures to argue. He endeavours to show that the study of the science of botany is necessary for a chemist and druggist, as without it he would not be able to understand one-half the definitions of materia medica in the B. P.,—such as "pellucid dots" or "indentations" in the description of Fol. Buchu. Does your correspondent really mean to assert that, without having studied botany, he would not have understood the meaning of the terms quoted? He distinctly says so, and I, for one, have no desire to charge him with inaccuracy. He might have selected better instances, and named terms which are not known to every schoolboy, and which cannot be found in an ordinary dictionary; but even such cases would not prove anything, as reference to a botanical glossary would suffice to help a student of materia medica over the difficulty.

I must decline to defend myself against the charge of incompetency as a teacher of pharmacy, to which Mr. K. is inclined to attribute the failures alluded to in my lecture. As to the remark of Professor Attfield, cited by your correspondent, I wish to say that distinguished lecturer's statement can only refer to his laboratory students and their examinations in chemistry. I never maintained that well-instructed students of chemistry were likely to fail in the chemical part of their examinations; and any one who will take the trouble of reading the report of my lecture will find that I have expressed myself strongly in favour of a thoroughly sound education and examination in pharmaceutical chemistry and materia medica.

I shall gladly reply to any comments upon my lecture which are supported by arguments, but I must decline to take any further notice of remarks such as Mr. Benjamin Keen has thought fit to make.

225, *Oxford Street, Manchester,* LOUIS SIEBOLD.
January 30th, 1872.

Sir,—Manchester has an unenviable reputation in matters political, and if Mr. Siebold's exposition of educational opinions be that of the majority of his fellow-citizens, they deserve the obnoxious epithet of pharmaceutical "*réactionnaires.*" The most striking answer to Mr. Siebold's complaints occurs on the same page of the Journal in which his lecture is printed. There are enumerated the questions which constitute the Preliminary examination of the Pharmaceutical Society, and only 58 per cent. of the number of candidates satisfied the Examiners. A lower third-form boy in any public school passes a considerably stiffer examination than this every three months. The two most important preliminary studies, and the most useful in rendering intelligible the rudiments of chemistry are here conspicuous for their absence,—I mean geometry and algebra. No wonder so few succeed in passing the Major and Minor. How is a student to understand the principles of crystallography who has never opened a Euclid? How is he to work out a chemical equation, if ignorant of the simplest rules of algebra? What do such words as hydrogen, polybasic, perigynous, etc. mean to him, if he has no acquaintance with Greek roots? empty sounds conveying no meaning to his understanding; so everything he learns is, to him, one continual cram and jumble of formulæ, hard words and incomprehensible technicalities. No man who has not mastered the first few books of Euclid and simple equations in algebra, is capable of appreciating the theory of the poly-atomicity of the elements, their combinations and substitutions, without inflicting a series of violent wrenches on his mental faculties. He is compelled to accept a number of doctrinal laws and facts which he cannot intuitively understand, and this constitutes a cram of the very worst description. Thus we find that in the last Minor examination, held in London, only twelve passed out of twenty-five, and out of three candidates for the Major, only one passed.

Formerly, when the examinations were purely voluntary, the proportion of rejected candidates was much less; not that the examinations are at all more difficult than they were five or six years ago, for, on the contrary, a somewhat higher theoretical standard of knowledge was required then, but because all young men of good education were desirous of emulating each other in earning a distinctive title above their fellows; and by a process of natural selection, none but really well-educated and capable students volunteered to undergo the ordeal of examinations.

In various quarters an outcry is raised against the study of botany, coupled with a florid eulogium on the advantages of a profound acquaintance with materia medica. What is the study of materia medica but a one-sided excrescence of botany? What mental satisfaction is there in recognizing the quality of a piece of jalap, if we did not know something of the difference between roots, tubers, stems, etc.; the formation of woody tissue, the habits of the plant, its Natural Order and its likeness to our common convolvulus? To know all this, we must learn something of botany, of the cellular construction of plants, their organs of nutrition and reproduction, and a thousand other minute characteristics.

The conversion of Bloomsbury Square into a botanic garden would, without interfering with its existing object, confer such a boon on pharmaceutical students, that few would ever fail in that department of their studies. Most Continental schools of pharmacy have gardens attached, which are free to all students and not jealously guarded for a select few, as the admissions to those in Regent's Park are here. If better opportunities existed for students to make themselves acquainted with the characteristics of medicinal plants, than is afforded by musty specimens and dogs'-eared plates, the study would find many more loving disciples than it now boasts of. A few beds planted with our native herbs, and relieved by a few subtropical and brightly-coloured plants or shrubs, such as the castor-oil palm, the *Iris grandifolia*, etc., would not only be an invaluable aid to the study of medical botany, but would gratify the eyes of the inhabitants of the square, and be a relief to the dingy grass and smoky foliage of the half-dozen plane-trees that cumber the ground.

I think that if our pharmacies were inspected annually, as in Prussia, and fines inflicted on those who neglected to renew their annual stock of indigenous herbs, roots, fruits, seeds and leaves, the study of botany would not find so many detractors. It is quite as essential to the technical education of the pharmacist as chemistry; we seldom make our own chemicals, yet no one disputes the necessity of learning that, —and how many country chemists there are who prepare their own liquor taraxaci, their syrups of violets, of red poppies and not a few green extracts. Those, too, who have gardens can have the satisfaction of growing their own medicinal herbs,—a shady corner sheltering a luxuriantly handsome belladonna shrub, an unsightly dung-heap covered and ornamented by the large white flowers of stramonium, with its curious prickly fruit, and a border of biennial henbane with its delicately-veined petals.

In most Continental schools of pharmacy, mineralogy, geology and zoology are taught, and surely it behoves a chemist to know something of the nature and composition of the ground he walks on, and even to turn his knowledge to good account; for if by hazard, he could devise a process "*tant soit peu*" economical for separating the potash from the silica, of which granitic rocks are formed, not only would a colossal fortune be his, but he would confer an everlasting benefit on mankind.

The preliminary test of a man's intellectual capability for working in the fields of science should at least include Euclid, algebra,—were it only as far as simple equations,—and the translation of the 'Iliad.' Decimals also should occupy a more prominent place, and the whole arithmetical test be much further advanced. The extraction of square and cube roots, the laws of arithmetical, geometrical and harmonical progression and logarithms should be insisted upon. Many persons complain of the loss of time and futility of spending so much money in acquiring a superficial knowledge of the dead languages. But in the case of a pharmacist who necessarily employs Latin daily, and who should not be puzzled by the first long word occurring in a prescription or in descriptive botany, both Greek and Latin are very necessary to enable him to seize the meaning of all the terse and definite terms which render the botanical description of a plant so precise as to picture in the eye of one familiar with them, the exact form and arrangement of the leaves, flowers and fruit of a plant described in a dozen words or so.

A knowledge of the metric system of weights and measures might judiciously be included in the Preliminary examination, and if prizes were offered for those who distinguished themselves as classical or mathematical scholars, we should probably hear less of subsequent failures in the Major and Minor ordeals. Not that by any means other branches of education should be neglected in order to raise the standard of mathematical or classical knowledge,—English composition and French or German ought to be encouraged, as specially useful in after-life. The writer has abundant pecuniary proof of *their* value in a business point of view. In furthering a higher standard of scientific education for pharmacists, we are expressing the views and ardent hopes of the rising and present generation of pharmaceutical chemists.

ERNEST J. T. AGNEW.

THE POISON CLAUSES OF THE PHARMACY ACT AND THEIR OFFICIAL EXPONENTS.

Sir,—It was with feelings of great indignation that I read the case of "Censure of a Chemist by a Coroner" in your impression of Saturday last. Within the last few months several chemists have been called over the coals by coroners for simply doing their duty, and acting (if we take for granted that the cases are truthfully reported) strictly in accordance with the Pharmacy Act. The apprentice in this case seems to have done everything that was necessary in selling such a poison as laudanum. There is no doubt that an affair such as is reported would do a great amount of harm to many chemists in large towns were it to happen to them. In my case, for instance, I am situated in the midst of a thickly-populated neighbourhood. Supposing I was summoned before the magistrates for selling twopennyworth of laudanum (after cautioning the purchaser, and doing what I am compelled to do by law), and highly censured for same, what would be the result? Why, the papers would contain a long account of it,—especially the sensational ones,—and I should be looked upon as a man who did not know his own business; the greater part of my customers would leave me, thinking I was not capable of dispensing or handling poisons. But my indignation arose from the fact that the coroners and magistrates seem to be entirely ignorant of the regulations respecting the sale of poisons, and through their ignorance a chemist is bound to submit. One thing has always struck me,—the chemist is censured, the coroner is left in ignorance, and there the matter seems to be allowed to drop. We hear occasionally of counsel being engaged to prosecute some unfortunate being who has been so unlucky as to break the law, but we never hear of counsel being engaged to defend a chemist who is unjustly reprimanded by those persons who are supposed to be conversant with the law, but who are continually showing their ignorance of it.

If such a thing is to continue, we are all at the mercy of coroners and magistrates. Is there no fund of the Society out of which some able barrister might be engaged to defend, in such a case,—at least, until the public and the coroners seem to understand the Pharmacy Act better? I asked one of the members of the Association in this town, "if such a case had to happen here, would the Association do their best to defend that man?" and the reply was, "He could not tell, they were too poor." But such cannot be the case with the Pharmaceutical Society. As to the youth being too young to sell two-pennyworth of laudanum, I cannot say a word; such an idea is simply absurd, and any right-thinking person who knew anything of the trade would say so. LEEDS.

LABELLING.—THE POISON REGULATIONS.

Sir,—Your correspondent, W. R. F., writing from Scarborough, seems to propound a doctrine which has been frequently held before, but which I consider to be altogether unsound, and one which I am anxious to protest against. He describes a case in which a lady of weak constitution sends her servant to a chemist for an ounce of paregoric, which he supplies. He labels it "paregoric elixir," with name and address of seller, and one of the new poison-labels. What would your correspondent or the law require more? He says that this was only "half doing it," and that the chemist ought to have had the dose printed on the label, when no ill-effects from an overdose would have occurred. He insinuates also, that if a bottle containing an ounce of paregoric so half-labelled had been sold to one in the country, where medical aid could not easily have been procured, and the buyer had chosen to take six drachms in four hours, and afterwards had become, from whatever cause, "very unwell, and, of course, very uneasy," the chemist so half-labelling the bottle would have been branded with a bad name in the locality, and a "good blowing up" might, I suppose deservedly, have happened.

Now, putting aside any question about the danger of taking six drachms of paregoric in four hours, or as to whether an overdose would make the patient too easy or "very uneasy," and not entering upon the other question, whether printing upon the label of such a thing as paregoric the dose for an adult would not lead to many fatal errors in apportioning the dose to children of a few months old,—here a chemist, having fully complied with the law in the matter of labelling, is made responsible for the ignorance or the stupidity of his customer. This is really too bad. An ironmonger may sell a razor without warning his customer against cutting his throat, and a publican may supply to a drunkard that which he knows is to such a man a poison; and yet in both these instances the buyer of the article is supposed to possess common sense, though in the latter case there is little evidence of it. But a druggist must not only prepare his medicines correctly, and describe them properly and according to law on the label, but he must also provide his customers with knowledge of their effects, with discretion in their use, and with that caution in the employment of dangerous things which children are supposed to learn at an early age.

A chemist of right principles will cheerfully comply with the requirements of the law, and, in addition, will give all needful directions for the use of strong remedies when he thinks that the safety of his customers requires them; but he will not burden himself with absurd responsibilities, or systematically insult his customers by treating them as if they were not possessed of common sense.

Leeds, Jan. 27th, 1872. EDWARD THOMPSON.

HOURS OF CLOSING.

Sir,—I am glad to find that the subject of shorter hours of business is at length attracting attention, and that influential men are coming forward as the champions of early closing. When such men as Mr. Giles speak, the pharmaceutical world listens. I have read with pleasure his remarks on the subject. That there are difficulties to be encountered, no sensible man will deny; but I hold that they are not insurmountable. Our business is a peculiar one; we are not ordinary traders; our duties may be looked upon as semi-professional; as in the case of the physician or surgeon, we must expect to be called upon at any hour to render our services in cases of sudden and alarming illness, and I am sure that no man worthy of the name of pharmacist will object to meet such a demand, ay, and cheerfully too, but he does object, and very properly, to be disturbed after the legitimate hour for closing by Mrs. Grundy, who habitually sends an old prescription for mixture or pills, which she has been in the habit of taking for the last ten or twenty years,—she never being able to remember that the bottle or box requires replenishing until she is preparing for bed.

I would suggest that, in order to protect ourselves from the inconsiderate and impertinent demands of the public, a higher rate of charges, say one-third, be asked, in order to compensate us for the extra demand upon our time.

I am quite certain that if pharmacists generally, laying aside all petty jealousy, were to agree to adopt this policy, nine-tenths of our unnecessary after-hours' business would be put a stop to.

Mrs. Grundy cares little for the inconvenience and discomfort she causes the pharmacist, but she does consider any extra demand upon her purse.

Another point I would mention is Sunday business. I am not one to insist upon a Puritanical observance of the Sabbath, but I do hold that the sanctity of the day should be respected, and that we ought not to supply on that day any article that may not really be required for medicinal purposes. I regret that in many of the largest and most respectable establishments the assistants are required to supply any article that may be asked for. The practice (and this is increasing) of keeping the shop door open on Sunday is a most objectionable one; it invites Sunday trading, and cannot be too loudly condemned. Looking at the question from the lowest stand-point, we ought to be above this practice, which places those who countenance it upon a level with the keeper of the spirit vaults or low beerhouse. Would it not be quite sufficient, and more in keeping with our dignity, to keep our doors closed, and have a notice such as the following (which I observed in one London establishment) affixed thereto?—"Such medicines only as may be urgently required can be obtained on Sunday at this shop. Please ring the bell."

Let us keep our conscience clear, and meet with a firm but courteous refusal the demands which may be made upon us for unnecessary articles on the Sabbath.

"PHARMACEUTIST."

Sir,—One word in reference to the early closing movement. Many thanks, I am sure, are due to Mr. Giles, for his able paper, and to all who have taken the matter in hand. But my idea is, "that there is too much bark and too little bite." We formed a committee here, but I believe the resolutions in the majority of cases have been broken. One will not close because his neighbour won't, and so we go on. It has been the talk for some time, but I think we let talking do for us. I propose as a remedy (for my opinion is, it will never become universal without) that we work all together, and try to get the Factories Act extended to retail trades, and then there can be no shirking; all will be compelled to close their shops at a certain time.

LEEDS.

OBSERVATIONS IN PRACTICAL PHARMACY.

Sir,—In justice to Dr. Symes, I beg to acknowledge that what he states respecting the guaiacum mixture in his paper, printed in the Journal for December 30th, 1871, is in the main correct if the simple tincture be taken for making it, the only noteworthy point of difference I have observed being that the resinous matter does not adhere to the glass.

I must confess that I wrongly supposed the ammoniated tincture was intended, there being no other officinal formula.

I wish it to be understood that the remarks on this subject in my letter of the 13th ult. are correct only so far as when applied to the mixture made with the ammoniated tincture.

The Dispensary, Grantham, G. WELBORN.
January 30th, 1872.

BENZOATE OF LIME, ETC.

Sir,—I really cannot plead guilty to the soft impeachment that places me in the wrong groove.

Having repeatedly prepared benzoic acid, both by sublimation and by the moist process, I am not unaware of the affinity possessed by benzoic acid for lime; but I need not remind you, Sir, of the wide difference that exists between pure hydrate of lime, and the salts of that alkali so usually present in hard water.

I have received several communications from friends upon the subject of this correspondence. One says he has lately "had a large batch of syrup of tolu spoiled in consequence of hard instead of distilled water having been used; the syrup was densely opaque, and had to be filtered through felt, when it was found to be very deficient in flavour, owing to its deprivation of benzoic acid, which remained on the filter as an insoluble precipitate. On examination the water was found contaminated with sulphates of lime and magnesia, with iron."

Surely this fact justifies my quotation of the note from "L'Officine!"

N.B. The note was not inserted with a view to diversion from the original question at issue, nor as a mere technical objection. And here allow me to quote an old saw:—

"An ounce of experience is worth a ton of theory."

I happen to be inheritor in the fourth generation of that long-lived complaint, asthma, and have had, during the last few weeks, to contend with an unusually severe attack of the complaint.

The usual remedies having failed to appease the symptoms, I was induced to try the comp. tr. benzoin, and first adopted Mr. Haselden's suggestion, taking it upon sugar, in order to obviate the irritating effect of the tincture upon the fauces, but found the benzoic acid, resin, etc. quite too much, causing me to gasp for breath.

I have tried decoction of linseed, and also mucilage of tragacanth, but found no vehicle to compare with new milk, with which the tincture blends admirably.

The effect of the remedy has been to cut short the attack, relieving the violent paroxysm of coughing, and the scarcely less unpleasant symptom, crepitation; thus securing comfort by day, and nights of undisturbed repose.

The jolly friar, to whatever order he belonged—whether black, white, or grey—who invented the compound, deserves to be held in honourable remembrance; and I believe the old remedy might be more generally adopted with the best results.

R. GOODWIN MUMBRAY.

Richmond, S.W., January 30th, 1872.

[*** This discussion is digressing so far from the original subject that we are unable to follow it further.—ED. PHARM. JOURN.]

THE POSITION OF WIDOWS UNDER THE PHARMACY ACT.

Sir,—"Nemo mortalium omnibus horis sapit" is as true now as ever. I was in error as to one portion of my remarks at the close of Mr. Siebold's lecture, reported in your Journal, and referring to the above. A widow may continue her husband's business under proper management. I ought to have known better, as I carefully studied the Act on its becoming law. The clause, however, referring to that subject had escaped my recollection, and a wrong impression had been produced on my mind by a conversation which lately occurred in my hearing. I honestly confess I was wrong on that one point, and express my regret.

J. T. SLUGG.

242, *Stretford Road, Manchester.*

A. P. S.—We are unable to give a form for chlor-alum; the name would imply that it is a solution of hydro-chlorate of alumina.

"*Vanilla.*"—Formulæ for vanilla-flavouring will be found in Vol. I. of the present series, pp. 878, 1001.

J. Bienvenu.—We find no reference to indigo carmine in Trousseau's 'Clinical Medicine,' the last work published by the Sydenham Society.

S. R.—About half a drachm of some resin, such as benzoin or common resin and powdered sugar, will make the pills tolerably small. Should the resin be objected to, liquorice powder and simple syrup will form a mass without much difficulty, but will make the pills larger. See also Professor Parrish's remarks on p. 634.

A. G. P.—Bisulphite of magnesia is prepared by supersaturating magnesia with sulphurous acid.

"*Spectrum.*"—A more powerful source of light and heat than in the ordinary lantern is required; the position of the lenses is different, and one or two good prisms are necessary.

T. Jones.—We are not aware, but recommend you to apply at the Colonial Office.

COMMUNICATIONS, LETTERS, etc., have been received from Professor Flückiger, Mr. C. Davis, Mr. J. Bienvenu, Mr. C. Francis, Mr. S. T. Severs, Mr. T. Jones, Mr. M. C. Cooke, Mr. J. W. Gill, P. Y., A. P. S., "Associate," "Spero," "Pharmaceutist."

"An Apprentice" has not complied with the regulation as to anonymous communications.

TINCTURE OF CINNAMON,*

IN CONNECTION WITH MR. HASELDEN'S PAPER READ DECEMBER 6, 1871.†

BY THOMAS GREENISH, F.C.S.

It will be in the recollection of those who were present at the last meeting of the Society in December that a paper by our President, "On the Syrup and Resin of Tolu and Tincture of Cinnamon," was, from the lateness of the hour, taken as read. There was consequently no discussion, and the paper was printed in the Journal of the following week. I had a few observations to make on one of the preparations, namely, the tincture of cinnamon, and, with the view of raising a discussion on a subject so eminently practical, and thereby eliciting the opinion of the members on some points in connection with it, I have embodied my remarks in the present paper. The sample shown by our President, which had undergone decomposition, was that of tincture of cinnamon, and is now on the table. I have also here a specimen of the compound tincture of cinnamon, in which similar changes, as regards the cinnamon which it contained, seem to have taken place.

Whilst engaged in the investigation of this subject, and going over the old Journals, a paper "On the Decomposition of Cinnamon Water," Vol. I. page 207, by the late Mr. Jacob Bell, attracted my attention. It is there stated, "The cinnamon water having lost its peculiar properties, it was found on examination that a quantity of cinnamic acid had separated in crystals;" and Mr. Redwood observed, "From the investigations of a German chemist, it appears that oil of cinnamon, when exposed to the air, absorbed oxygen very rapidly, giving rise to the formation of cinnamic acid and two resins—resin alpha and resin beta."

The result of some carefully-conducted experiments by Mr. W. Bastick, which will be found in a paper in Vol. VII. page 268, on "The acetous fermentation of some of the alcoholic preparations of the Pharmacopœia," seems to prove that in most proof-spirit tinctures, if kept for a time in bottles more or less full,—in fact, in the condition in which they are usually found on the shelf of a dispensing establishment,—and at a temperature of from 60° to 80° F., there is decomposition of the alcohol, and a partial destruction of the vegetable principles themselves, the proof-spirit tinctures only being liable to this change. Among others which he had observed to decompose he mentions the compound tincture of cinnamon; and his experiments point to one remedy, a stronger alcoholic solution as a menstruum.

Taking the same view of the cause and the remedy, and to guard against a similar decomposition in the simple or compound tincture, I made each of them with 6 parts spirit and 2 parts water, instead of 5 and 3, and the result has been that under the same conditions neither of the tinctures at the present time show any signs of change.

Consulting the continental Pharmacopœias with reference to this subject, I find that the spiritus vini dilutus of the Austrian Pharmacopœia is stronger than our proof spirit; it has a sp. gr. ·892; and the spiritus vini rectificatus, which is its equivalent in the Prussian Pharmacopœia, and with which their tinctures of cinnamon are made, is about the same as the strength of spirit which I have found it desirable to use in making these two preparations.

I now approach a much larger subject, but one, I think, quite worthy of consideration,—whether having regard to the proximate principles of the several substances which constitute the ingredients of a tincture, the relative proportions of spirit and water may not in some instances be varied with advantage as regards solubility, also with a view to the permanence of the resulting preparation.

On reference to the British Homœopathic Pharmacopœia, a work that I would recommend to the careful perusal of every pharmacist, there are some very pertinent remarks, which I take the liberty of quoting, on the preparation of the tinctures contained in it, and it will be observed that six different strengths of spirit are employed.

"1st. *Dilute Alcohol.*—This is made by mixing equal measures of rectified spirit and distilled water. The mixture should have a density of ·935, and contains 42 per cent. of absolute alcohol.

"2nd. *Proof Spirit* (British Pharmacopœia).—This is made by mixing 5 measures of rectified spirit with 3 of distilled water. It should have a density of ·920, and contains 49 per cent. of absolute alcohol.

"3rd. *Spirit of* 20 *O. P.*—This is made by mixing 6 measures of rectified spirit with 2 of distilled water. It should have a density of ·888, and contains 63 per cent. of absolute alcohol.

"4th. *Spirit of* 40 *O. P.*—This is made by mixing 7 measures of rectified spirit with 1 of distilled water. It should have a density of ·865, and contains 73 per cent. of absolute alcohol.

"5th. *Rectified Spirit* (60 *O. P.*) has a density of ·830, and contains 84 per cent. of absolute alcohol.

"6th. *Absolute Alcohol* having a density of about ·793 is required for a few of the preparations."

Again, under the head of tinctures, it is very properly stated that "the objects to be attained in these preparations are the following:—

"1st. A preparation containing all the soluble ingredients of the substance employed.

"2nd. A uniform strength, so that it may be always known exactly how much of the dry crude material is represented in a given measure of the tincture."

And it further states, that "these objects may be attained in the following manner:—

"1st. The complete solution of all soluble matter can be accomplished by varying the alcoholic strength to suit the nature of the ingredients in each plant, using a very dilute spirit where the ingredients are chiefly soluble in water, and a strong spirit where alcohol is the best solvent."

Referring to the practice in this Pharmacopœia with regard to tincture of cinnamon, I find that rectified spirit is used as a menstruum.

A paper by Mr. Giles, read before the Bristol Pharmaceutical Association, will be found in the Journal of January 20th, in which the author reviews the Pharmacopœial tinctures generally with reference to their alcoholic strength, and expresses an opinion that the subject is deserving of more attention than it appears to have received. Mr. Giles has so ably stated the case, that I need do no more than refer to that paper as containing pretty well all I have further to say on this part of the subject; and, in conclusion, I am of opinion that many of the proof-spirit tinctures of the British Pharmacopœia

* Read at the Evening Meeting of the Pharmaceutical Society of Great Britain, February 7, 1872.

† See *ante*, p. 467.

may, with a view both to permanence and efficiency, be made with a stronger solution of alcohol than that of 5 and 3, which constitutes our proof spirit.

[*The discussion upon this paper is printed at p.* 652.]

THE MADAGASCAR CARDAMOM OR LONGOUZE.*

BY DANIEL HANBURY, F.R.S.

In several works on Materia Medica published within the last fifty years,† mention is made of a *Madagascar Cardamom* the fruit of a zingiberaceous plant called *Amomum angustifolium.* Sonnerat the author of this botanical name, was a French traveller who visited Madagascar in the second half of the last century. Among the plants of that island which he described‡ was the species in question, which he thought he identified with the *Great Cardamom* of ancient writers, a drug we now know to have a very different origin. The name *Grand Cardamome* had, however, been given to it more than a century before by Flacourt§ another explorer of Madagascar. Both Flacourt and Sonnerat state that the plant is known as *Longouze*, and the latter adds that it has been introduced into the Isle of France where it thrives well. The fruit is described as of a scarlet colour, filled with a white pulp of pleasant acidulous taste, in which are imbedded numerous, spicy, brown seeds. The plant is said to grow in great plenty in marshy places, but no mention is made of the fruits being ever collected for the purposes of commerce.

In 1854, Mr. Emile Fleurot of Mauritius contributed to the Museum of the Pharmaceutical Society specimens and drawings of the *Longouze* which is now apparently wild in that island. They were labelled in accordance with Bojer's *Hortus Mauritianus*|| *Amomum nemorosum*, under which name they were not recognised as Sonnerat's plant. It appears however that this *A. nemorosum* Bojer is but a synonym of *A. angustifolium*, Sonn., with which in fact the specimens communicated by Mr. Fleurot entirely agree. The plant is still claimed in Mauritius to be the *Grand Cardamome de Madagascar.***

A collection of Mauritius drugs sent to the Paris Exhibition of 1867 included fruits of *Amomum angustifolium*, from which I obtained a few seeds that germinated. During the past summer (1871) one of the plants thus raised produced flowers, which having been fertilized artificially, were succeeded by ripe fruits.

Now a most interesting point about this plant is its complete identity with a species of *Amomum* growing in Tropical western Africa. Though Mr. Fleurot's excellent drawings might well have raised suspicions that such was the fact, it was not until my plant flowered that I convinced myself that the *Amomum Danielli* of Hooker could in no way be distinguished from the *A. angustifolium* of Sonnerat. *A. Danielli* Hook. f. has been figured three times in the last twenty years,* yet its similarity to the Madagascar plant has not been noticed, although of the latter there is in addition to Sonnerat's plate, an excellent drawing in Roxburgh's unpublished collection, now in the herbarium of the Royal Gardens, Kew.

The West African area of the plant extends along the coast line from Sierra Leone to Gaboon, and perhaps still further south. Growing over this wide district and under considerable variation of altitude, the plant presents some variations; the flower is either yellow or red, or has the labellum alone, yellow. The scape is simple or branched, short or long, and varies in the number of fruits it bears; and the fruits themselves differ much in size according to locality. But the labellum is always narrow and pendulous, and the seeds oblong and highly polished. The negroes of West Africa eat the pleasantly acidulous pulp of the fruit, and apparently do not use the seeds, but in Mauritius according to Bouton, the latter are chewed to sweeten the breath.

I have no reason for believing that the fruits of *Amomum angustifolium* Sonn. have ever been even an *occasional* article of export, either from Eastern or Western Africa, and feel quite certain that they never formed a regular object of commerce with Europe. The seeds are weak in aroma and have a disagreeable irritating taste, so that they could with no advantage replace the cardamoms of Malabar or Ceylon.

* Read at the Evening Meeting of the Pharmaceutical Society of Great Britain, February 7, 1872.

† Fée, *Cours d'Hist. Nat. pharmaceutique*, I. (1828) 361; Guibourt, *Hist. des Drog.* II. (1849) 216; Martiny, *Encyklopädie d. med. u. pharm. Rohwaarenkunde*, II. (1854) 771; Berg, *Pharm. Waarenkunde*, 1863. 425.; Wiggers, *Handbuch d. Pharmacognosie*, 1864. 176.; Henkel, *Handbuch d. Pharmacognosie*, 1862. 382.

‡ *Voyage aux Indes Orientales et à la Chine*, II. (1782) 242. pl. 137.

§ *Hist. de la grande isle de Madagascar*, Paris, 1658. 126.

|| Maurice, 1837. p. 327.

** Bouton, *Medicinal Plants growing* * * *in Mauritius*, 1857. p. 152.

* Hooker's *Journ. of Bot.* IV. (1852) pl. V. sub nom. *Amomum Afzelii;* Bot. Mag. tabb. 4764. 5250.

THE SEPARATION AND QUANTITATIVE DETERMINATION OF THE DIFFERENT CINCHONA ALKALOIDS.†

BY DR. J. E. DE VRY.

Since the publication of my paper "On the Determination of the Amount of Alkaloids in Cinchona Bark,"‡ my multiplied analyses of various barks have led me to adopt a new method for the detection of different alkaloids contained in the mixture obtained in determining the total amount of alkaloids in any bark, and to ascertain their relative quantity.

The alkaloids known at present with *certainty* to exist in cinchona barks are quinine, cinchonidine, cinchonine, quinidine, and an amorphous alkaloid soluble in ether. Of these five alkaloids, the two first mentioned are lævogyre, whilst the three last mentioned are dextrogyre. The fact that the amorphous alkaloid, of which some Indian barks contain a relatively large quantity, turns the plane of polarization to the right, proves that it should not be considered as amorphous quinine. It is an alkaloid *sui generis*, which is perhaps identical with Pasteur's quinicine. I am still investigating it, and, as I have recently received from Pasteur a sample of the qui-

† Read at the Evening Meeting of the Pharmaceutical Society of Great Britain, February 1, 1872.

‡ PHARMACEUTICAL JOURNAL, August, 1864.

nicine prepared by himself in 1853, I hope to be able either to ascertain or to deny this identity. Till then I shall continue to denominate it "amorphous alkaloid soluble in ether."

It has been till very recently my opinion that all the above-mentioned five alkaloids did not occur together in any well-defined species of cinchona, but that, if they really were found together in a bark, that bark was taken from a hybrid. Thus, for instance, I found all five alkaloids in the bark of *C. Hasskarliana*, Miq., which so-called species is nothing else but a hybrid of *C. Calisaya* fructified by the pollen of *C. Pahudiana*. As the *C. Pahudiana* of Java contains cinchonidine, and the *C. Calisaya* of the same locality contains very often quinidine, the occurrence of both these alkaloids, together with the three others, in the hybrid of these species did not surprise me.

I am, however, now obliged to give up this opinion, as I recently found that the bark of *C. succirubra*, grown in Darjeeling, contains all the five alkaloids together. As in the red barks from Ootacamund which I have analysed I always found cinchonidine and never quinidine, I supposed this fact to be a general rule; and, consequently, when I analysed, in December, 1870, the red bark from Darjeeling sold in October of that year in London, I found cinchonidine, but did not search for quinidine.

I was, therefore, much surprised in finding all five alkaloids contained in a sample of mixed rough alkaloids,* prepared by Dr. B. Simpson from green red bark at Darjeeling. This unexpected fact induced me to make another analysis, both of red bark from Ootacamund and of red bark from Darjeeling. The result was that I found cinchonidine without quinidine in the red bark from Ootacamund, whilst that from Darjeeling proved to contain both cinchonidine and quinidine. To avoid the mistake of again overlooking one of the alkaloids which might be contained in a given bark, I now use another method, which is based upon the following facts:—

1. The great solubility of quinine and amorphous alkaloid in ether, and the *relative* insolubility of quinidine, cinchonidine and cinchonine in this liquid.

2. The great solubility of the iodo-sulphate of the amorphous alkaloid in alcohol, and the very small solubility of the iodo-sulphate of quinine (herapathite) in this liquid.

3. The great difference in solubility between the tartrate of cinchonidine and the tartrates of cinchonine and quinidine,—the first being soluble in 1265 parts of water at 10° C.,† the second in 35·6 parts of water at 16° C.,† and the third in 38·8 parts of water at 15° C.‡

4. The great difference in solubility between the hydriodate of quinidine and the hydriodates of cinchonidine and cinchonine in water and alcohol.

1 part of hydriodate of quinidine requires 1250 parts of water at 15° C., or 110 parts of alcohol.

1 part of hydriodate of cinchonidine requires 110 parts of water, or 3 parts of alcohol.

* Broughton's amorphous quinine.

† O. Hesse, *Annalen der Chemie und Pharmacie*, vol. cxxxv. p. 337.

‡ O. Hesse, *Ibid.* vol. cxlvi. p. 357. The numbers obtained by my own experiments in this direction differ only very slightly from those obtained by Hesse. This difference is, therefore, of no consequence for the practical application.

1 part of hydriodate of cinchonine requires 128 parts of water, or 3 parts of alcohol.

These facts are applied to the separation and determination of the different cinchona alkaloids in the following manner:—

5 grams* of the pulverized mixed alkaloids are mixed with 50 grams of ether, and the mixture, after well shaking, left at rest till the next day. By this operation the alkaloids are separated into two parts, viz. one part soluble in ether, and another part insoluble in that liquid. The part soluble in ether contains the quinine and the amorphous alkaloid, together with traces of quinidine or cinchonidine, whilst the insoluble part contains the cinchonidine, cinchonine and quinidine. These two parts are separated by a filter, the insoluble part washed with some ether, and the ethereal solution either evaporated or distilled.

A. *Part soluble in Ether.*

The residue left by the evaporation of the ether is dissolved in 10 parts of proof spirit acidulated by one-twentieth of sulphuric acid. To this solution is carefully added an alcoholic solution of iodine till a precipitate is no longer formed. This part of the process is the most difficult, and requires some experience. If the mixed alkaloids contain a large amount of quinine, there appears immediately a black precipitate of quinine-herapathite, whereby the addition of the solution of iodine is regulated; but if the amount of quinine is only very small, it may happen that the precipitate of herapathite does not appear immediately. In such a case only a small quantity of iodine must be added, and the liquid, after having been stirred by a glass rod, left till the next day. If quinine is really present, it will then be precipitated in the form of herapathite. The chief desideratum of this part of the process is to add enough and not too much iodine. The herapathite is collected upon a filter, washed with strong alcohol, dried upon blotting-paper, and heated in a water-bath. One part of the herapathite, thus dried, represents 0·565 part of pure quinine.

The liquid separated from the herapathite is mixed with an alcoholic solution of sulphurous acid, whereby the iodo-sulphate of amorphous alkaloid is converted into hydriodate, and the red-brown colour disappears. The solution is then carefully neutralized by caustic soda, and heated on a water-bath to expel the alcohol, after which it is precipitated by a slight excess of soda. The precipitate consists of the amorphous alkaloid, containing traces of quinidine or cinchonidine, if these alkaloids were contained in the mixed alkaloids.

B. *Part insoluble in Ether.*

This part is mixed with 40 parts of hot water, and converted into neutral sulphate by careful addition of diluted sulphuric acid, so that a solution is obtained having a slight alkaline reaction upon red litmus paper. To this solution a solution of tartrate of potash and soda is added in sufficient quantity to convert the sulphates into tartrates, and, after stirring with a glass rod, it is left till the next day. If cinchonidine be present in appreciable

* The mentioned quantity is the minimum which I use for this determination, but, if possible, I prefer to use a larger quantity.

quantity, its tartrate will be found separated in crystalline form, whilst the other tartrates remain dissolved; if only traces of cinchonidine be present, striæ will be observed on every spot of the glass which has been rubbed by the glass rod. The tartrate of cinchonidine is collected upon a filter, washed with a little water, and dried on a water-bath. One part of this tartrate represents 0·804 part of cinchonidine.

The liquor separated from this tartrate is mixed with a solution of iodide of potassium, and well stirred by a glass rod. If quinidine is present in appreciable quantity, a sandy crystalline powder* of hydriodate of quinidine will be precipitated, which is collected upon a filter, washed with a little water and dried on a water-bath. One part of this hydriodate represents 0·718 part of anhydrous quinidine. If only a trace of quinidine be present, no precipitate will appear, but only striæ on every spot of the glass which has been rubbed by the glass rod.

The liquor separated from the hydriodate of quinidine is precipitated by caustic soda, whereby the cinchonine is obtained.† It is collected upon a filter, washed with water and dried on a water-bath.

I am perfectly aware that this process is far from perfect. So, for instance, the tartrate of cinchonidine and the hydriodate of quinidine, although difficultly soluble in cold water, are not insoluble; and therefore the quantities of the alkaloids determined by this process are too small, whilst, consequently, that of the cinchonine is found too large. The best part of the process is the accurate determination of the *real* quinine contained in a bark, and the impossibility of overlooking one of the mentioned five alkaloids which may be contained in a bark.

The Hague, December 28th, 1871.

[*The discussion upon this paper is printed at p.* 654.]

SAMADERA INDICA, *Gærtn.*‡

BY DR. J. E. DE VRY.

The paper of Mr. M. C. Cooke on page 541 of this volume of the PHARMACEUTICAL JOURNAL, reminds me of some investigations made by me in this direction during my stay in Java, which will perhaps prove to be of interest in reference to the subject of that paper.

The first investigation of the bark and the kernels of the fruit of the tree mentioned, which is called by the Malays *Gatip pahit*, was made, in July 1857,§ by D. W. Rost van Tonningen, who was at that time first assistant to the late Dr. Fromberg, in the then existing chemical laboratory of Buitenzorg in Java. In 100 parts of the bark of the tree he found:—

Part soluble in Ether (fat)	1·409
,, in Alcohol (resin)	5·119
,, in Water (tannic acid, extractive matter, samaderine)	2·203
Mineral substances	7·913
Cellulose	70·656
Water	11·832
Loss	0·868
	100·000

In 100 parts of the kernels of the fruit he found:—

Part soluble in Ether (oil)	34·260
,, in Alcohol (resin)	8·380
,, in Water (tannic acid, extractive matter, samaderine)	10·585
Part soluble in Potash (pectic acid)	0·160
Mineral substances	2·733
Cellulose	39·000
Water	4·577
Loss	0·305
	100·000

The samaderine was obtained by treating the watery extract with small quantities of alcohol, by which treatment the greatest part of the samaderine was left in crystals. These were redissolved in water, the solution digested with animal charcoal and recrystallized.

The samaderine is white, and crystallizes in the shape of feathers. Its taste is very intensely bitter, much more so than the author ever observed in any analogous substance. Its chief and characteristic reaction is that with concentrated sulphuric acid, which gives a beautiful red-violet colour upon the addition of a trace of samaderine. The quantity of samaderine obtained was too small for further investigation, and the author intended to return to this subject as soon as he was in possession of a sufficient quantity of bark and kernels of the fruit. This intention, however, he was never able to carry out, and as, in April 1863, a small quantity of the kernels of the fruit came into my possession, I took the matter up, chiefly with the object of obtaining the samaderine.

640 grams of kernels, dried at 100° C., were pulverized and expressed by a press. I obtained 210 grms., consequently 32·8 per cent. of a clear light yellow oil of a bitter taste, and 0·9175 s. g. According to the investigation which Dr. A. C. Oudemans made of it, after my return to Europe, it consists of 84 per cent. tri-oleine, and 16 per cent. tristearine and tri-palmitine. The oil is not siccative.

After the expression of the oil, the cake was pulverized again and treated with alcohol. The alcoholic tincture was mixed with a slight excess of an alcoholic solution of acetate of lead, whereas a slightly yellow-red precipitate was formed. This precipitate was separated by a filter, and the excess of lead removed from the liquor by sulphuretted hydrogen. By these manipulations the reddish-yellow colour of the liquid was only slightly diminished. By evaporation I could not obtain any crystals, but obtained a yellowish extract, which was very hygroscopic. I found, however, that this extract contained a lime-salt, and as all my endeavours to obtain the crystals of samaderine, described by Rost van Tonningen, failed, I suppose that these crystals consisted of a lime-salt impregnated by

* If the quantity of the quinidine is very small in relation to that of the cinchonine, the precipitate will not be sandy and crystalline, but often somewhat resinous. This difference is caused by some hydriodate of cinchonine, and can easily be removed by washing the precipitate with a little alcohol.

† Sometimes I have found a trace of an amorphous alkaloid in the thus obtained cinchonine. I suppose, therefore, the existence in some barks of a second amorphous alkaloid, which is insoluble in ether.

‡ Read at the Evening Meeting of the Pharmaceutical Society of Great Britain, February 7, 1872.

§ 'Acta Societatis Scientiarum Indo-Neerlandicæ,' vol. iii.

samaderine. I am confirmed in this supposition by his description of the manner by which he obtained the crystals of samaderine, viz. by treating the watery extract with small quantities of alcohol. This method could, perhaps, succeed if the samaderine was either insoluble, or little soluble, in alcohol; but as I found the contrary, this method of preparation cannot lead to successful results.

After many unsuccessful endeavours, I at last obtained the samaderine, but not crystallized, by the following method:—The alcoholic extract was treated with water till all the bitter substance was dissolved and the watery solution filtered. The clear liquid, which was intensely bitter, was shaken with a large quantity of animal charcoal, which absorbed the bitter principle. The charcoal was collected on a large filter, well washed with water and dried. The yellow liquid filtered from the charcoal proved to contain a relatively large amount of sugar. By treating the dried charcoal with alcohol, I obtained a slightly yellow liquid, which was intensely bitter. Upon distillation of the alcohol there remained a slightly-coloured residue, which I suppose to be the isolated bitter principle to which Rost van Tonningen has given the name of samaderine. It is very soluble both in water and in alcohol, and gives with sulphuric acid the characteristic reaction described by the above chemist. I suppose it to be a glucoside, but the small quantity did not allow me to investigate it further, and as I soon afterwards left Java, I took it with me to Europe. As now, by Mr. Cooke's papers, the attention of the pharmaceutical public is fixed upon this plant, I forward with this paper my specimen of samaderine to the Museum of the Pharmaceutical Society. If samaderine should prove to be a valuable medicine, it will be practical to use the kernels and not the bark of the tree for its preparation; which kernels will be, at the same time, a valuable source of oil. The kernels contain the bitter principle in much larger quantity than the bark; their collection is accomplished without injury to the tree; but if the bark is used, a cutting of the tree is involved.

[*The discussion upon this paper is printed at p.* 654.]

PREPARATION OF CRYSTALLIZED INDIGOTINE.

BY M. C. MÉHU.*

While making some experiments with indigotine obtained from urine, the author was led to try its solubility in carbolic acid. Indigotine is usually described in chemical works as being insoluble in water, alcohol, ether, fixed and volatile oils, dilute acids and alkalies. Boiling concentrated alcohol, however, dissolves sufficient to acquire a decided blue colour, as also does methylic alcohol; both these solvents lose the greater part of the colouring matter upon cooling,—sometimes depositing crystals, which, however, require the microscope for their detection. But M. Méhu has found that, under the influence of heat, carbolic acid dissolves freely the blue colouring principle of indigo, and deposits the greater portion of it upon cooling in a crystalline form. Alcohol, camphor (one part to fifteen of the carbolic acid), or benzine may be added to prevent the solidification of the carbolic acid on cooling; they also assist the precipitation of the colouring matter.

By this method the author states that, operating with 500 grams of carbolic acid, he has obtained two grams of pure indigotine, in crystals which, to the naked eye, appear of a copper colour, but under the microscope are seen to be dark, frequently opaque blue, and remarkably perfect in form. The indigo employed should be washed with water, then with water acidulated with hydrochloric acid, and finally several times with fresh boiling alcohol.

The author suggests that this definite form of indigotine might be utilized in colorimetric operations.

* 'Journal de Pharmacie et de Chimie,' 4th ser. vol. xiv. p. 412.

TANNIN AND GLYCERIN.

BY R. ROTHER.

Tannic acid is frequently prescribed in concentrated solution with glycerin: but tannin, commercially obtained, possesses various impurities which either remain as insoluble turbidity or discolour the solution. Firstly, a green resinous colouring matter, insoluble in water but soluble in strong alcohol and glycerin, invariably occurs. This contamination results from the solvent action of the ether in the original process of extracting the tannin. Secondly, metallic chips of copper, iron, etc., from the vessels in which the tannin was dried are never absent.

A concentrated solution of tannin is nearly indispensable among the requisites of the prescription department. An aqueous solution, however concentrated it may be, will spoil. An alcoholic solution is often objectionable; but an aqueous solution, containing glycerin, can be utilized on most occasions.

This solution is best adjusted by weight; it is perfectly stable, clear and transparent, and contains one troy ounce of tannic acid in two troy ounces of the solution, that is half tannin by weight. The solvent is the other half, or one-fourth each by weight glycerin and water. More than this proportion of glycerin cannot be used to advantage, as the liquid becomes too thick to pour conveniently. This solution cannot be prepared, however, by directly combining the three ingredients, as the impurities must first be removed; and the only preliminary solvent for this purpose, which the writer has found to answer perfectly, is a mixture of equal measures of strong alcohol and water. A very concentrated solution, in the proportion of two parts of liquid to one of tannin, can be formed with the aid of heat, which filters with the greatest facility, leaving the resinous colouring matter and the metals untouched.

Alcohol alone, in the proportion of four to one of tannin, would not filter well. Water, in the proportion of at least four to one of tannin, would not filter even as rapidly as the solution with alcohol; and whilst the alcoholic solution becomes turbid with water, the aqueous solution never became clear from the first, and, moreover, was always much darkened by the metallic impurities forming coloured soluble tannates. The preliminary solvent and permanent solvent above proposed are, therefore, the only available ones. These form a light green, thin, syrupy solution, miscible with glycerin and water in all proportions without losing their brightness, and forming in a more dilute condition colourless solutions.

From these observations the following formula is deduced:—

Take of Tannin	8 troy ounces.
Glycerin	4 " "
Strong Alcohol . .	8 fluid ounces.
Water.	8 " "

Mix the alcohol and water; add the tannin and apply heat until the tannin is dissolved. Filter hot, then add the glycerin and evaporate by a careful heat until the solution weighs 16 troy ounces.—*Chicago Pharmacist.*

REACTIONS OF CARBON BISULPHIDE.

BY F. SESTINI.*

Solubility in water.—Carbon bisulphide is not quite insoluble in water. After several days' contact at ordinary temperatures, water takes up about 1 part in 1000 of its weight of this compound, a very small quantity at the same time undergoing decomposition. The aqueous solution, when distilled, gives up the carbon bisulphide unaltered, at the commencement of the distillation. It has the odour of the compound, a slightly burning taste, and does not contain more than 0·002 gram of hydrogen sulphide in a litre.

Reactions with the Hydrates of the Alkaline Earths.—When a mixture of water, calcium hydrate and carbon bisulphide is exposed to the action of solar light in summer, the liquid in six or eight hours acquires a fine yellowish-red colour, and during the following night deposits a few very fine prisms of an orange-red colour.

The same reaction takes place in two hours when carbon bisulphide is heated to about 50° with milk of lime. The liquid, filtered while hot, does not deposit any crystals on cooling, but, on adding calcium hydrate to the cooled filtrate, it yields the prismatic crystals above mentioned.

These crystals consist of a compound of hydrate and sulphocarbonate of calcium, represented by the formula $3\,CaH_2O_2 . CaCS_3 . 7\,H_2O$. The formation of the sulphocarbonate, which however is preceded by that of sulphide of calcium, is represented by the equation—

$$3\,CaH_2O_2 + 3\,CS_2 = 2\,CaCS_3 + CaCO_3 + 3\,H_2O.$$

Hydrate of barium acts exactly like hydrate of calcium, and gives rise to a yellow compound which crystallizes in short prisms.

The hydrates of strontium and magnesium likewise acted in the same manner (the latter but feebly), but did not yield crystallized compounds.

The reaction with calcium hydrate may be applied to the detection of carbon bisulphide in solution.—*Journal of the Chemical Society.*

* Gazzetta chimica Italiana, i. 473.

SHEFFIELD PHARMACEUTICAL AND CHEMICAL ASSOCIATION.—ANNUAL DINNER.

The Annual Dinner of the above Association was held on Wednesday, Jan. 31, at the Adelphi Hotel; the newly-appointed President, Mr. W. V. Radley, occupied the chair. After the cloth had been withdrawn, and the usual preliminary toasts proposed and duly responded to,

Mr. E. Birks gave the toast of the evening, "Success to the Sheffield Pharmaceutical and Chemical Association." In the course of his remarks, Mr. Birks alluded to the object of such an association, which he thought was primarily to instruct the apprentices and associates, whom he reminded, if their study was to be real and beneficial, it must be applied to by constant and unwearied diligence.

Mr. Dobb replied, in an eloquent speech. Alluding to the benefits conferred by the association, he said that, even if it ceased to be an educating body, yet it would always, as the representative body of the chemists of that important town, make itself felt, as it had done in the past session. With regard to the proposed "Pharmacy Amendment Act," he said the action of this Society had had a visible effect.

Mr. Wards proposed "The Medical Profession," which was responded to by Dr. Hime. He said he trusted that the good feeling then displayed might be increased, as it was indispensable that there should be such a feeling existing between them and the medical profession. In referring to dispensing, he said he hoped that the time was not far distant when quackery on the one hand would be utterly abolished, and, on the other hand, when the medical practitioners would altogether discontinue the dispensing their own medicines, and so leave the lawful calling of dispensing to the trained and qualified chemist.

The other toasts were "The Honorary Members and Lecturers," "The President," "The Council and Officers of the Association," "The Ex-Secretary."

At intervals during the evening several songs and recitations were rendered, and the company broke up at a late hour.

SOIRÉE OF THE BIRMINGHAM AND MIDLAND COUNTIES CHEMISTS' ASSOCIATION.

On Tuesday evening, February 6th, the President, Mr. George Dymond, gave a soirée to the members and associates of this society, at Lovegrove's Royal Hotel. There was a very large attendance,—more than a hundred chemists and assistants and medical and other scientific men of the town and district, and an equally large number of ladies present. Various scientific objects and apparatus were ranged round the room, all of which were of the greatest interest to the visitors.

Mr. Lancaster exhibited some valuable microscopes, and showed with them some admirable objects; he had also several graphoscopes, through which a number of large photographs were seen to great advantage.

Mr. Field, aided by several pharmaceutists, made up a good show of microscopes.

Messrs. Southall, Son and Dymond, exhibited a collection of roots and herbs which are officinal in the Pharmacopœia of India, and which do not appear in the British Pharmacopœia. Some of the specimens attracted particular attention.

Mr. C. J. Woodward, B.Sc., chemical lecturer at the Midland Institute, exhibited some beautiful experiments with the oxy-hydrogen spectro-polariscope, showing the colours which may be produced on a white screen by means of sections of selenite and other substances before the lime-light.

Many other objects of interest were exhibited by Mr. F. Bird; Mr. George Gore, F.R.S.; Mr. Alfred Creswell; Mr. W. H. Cremer; Dr. Hinds; Mr. W. H. Jones; Mr. W. L. Scott and other gentlemen.

The room was admirably arranged, and great taste was displayed by the committee.

Mr. C. L. Cornish and Mr. Alfred Bird, F.C.S., kindly lent a number of large photographs of Swiss and other views.

Dancing commenced a little after ten o'clock, and was kept up with great spirit till after one.

It was a pleasant feature of the evening to observe the perfect unanimity of feeling and cordiality which prevailed among all present, and how thoroughly the cares and anxieties of a pharmaceutist's life were for once cast aside.

At the conclusion of the last dance, the M.C., Mr. Alfred Bird, jun., proposed three cheers for Mr. Dymond (to whom they were indebted for the pleasant evening which they had spent), which were very heartily responded to.

It is only just to say that the great success of the soirée was entirely due to the untiring exertions of the secretaries of the Association, Mr. Lucas and Mr. Jones, and of the stewards, especially Mr. A. Bird, jun., Mr. Howes and Mr. W. J. Churchill; and the hope was expressed by all present that this, the first soirée of the Birmingham chemists, might be the precursor of many annual gatherings.

The Pharmaceutical Journal.

SATURDAY, FEBRUARY 10, 1872.

Communications for this Journal, and books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

PRELIMINARY EXAMINATION.

MUCH attention has been lately directed to this Examination, and, if we may judge by the discussion which has taken place, a great deal of misapprehension exists in the minds of many with regard to the number of candidates permanently excluded at this stage from the ranks of British pharmacy, through being incapable or unwilling to pass. If we take the year 1870, the last year for which we can get complete returns, we find that 741 candidates presented themselves to the London Board of Examiners, and that out of this number 641 eventually passed, making the failures rather less than 13½ per cent., a result which will, we believe, bear favourable comparison with any other examination of a similar description.

The following tabulated statement for the year will, perhaps, interest some of our readers:—

February 21st, 1870.

Candidates 193.

Passed first day of Presentation	103
July, 1870	19
October, 1870	18
January, 1871	9
April, 1871	3
July, 1871	6
October, 1871	1
Disappeared	34
	193

April 25th, 1870.

Candidates 147.

Passed first day of Presentation	109
October, 1870	8
January, 1871	9
April, 1871	4
July, 1871	1
Disappeared	16
	147

June 20th, 1870.

Candidates 177.

Passed first day of Presentation	145
October, 1870	5
January, 1871	4
Disappeared	23
	177

October 3rd, 1870.

Candidates 224.

Passed first day of Presentation	164
January, 1871	14
April, 1871	10
July, 1871	6
October, 1871	3
Disappeared	27
	224

A NEW BOARD OF EXAMINERS IN IRELAND.

THE subject of a Pharmacy Bill for Ireland, which last year was discussed with some interest, does not yet appear to have been publicly broached during the present Parliamentary Session. Should the public spirit of the Poor Law Guardians of Londonderry, however, find many imitators among similar bodies, an application to the Legislature might be rendered unnecessary. We are informed by the *Lancet* that it having been proposed to the above Board to promote one of the female nurses to the office of apothecary, she was examined by a guardian as to her skill in pharmacy:—

"'Would you object,' quoth the guardian, 'to another nurse assisting you in compounding drugs?' 'Well,' was the answer, 'she might look on; but I could not let her do it.' Guardian: 'Could not Dr. White do it?' Nurse: 'No; Dr. White would not waste his time doing it.' Guardian: 'Can you read the doctor's prescriptions?' Nurse: 'Yes; I can read the Latin as well as the English.' Guardian: 'Are you a Latin scholar?' Nurse: 'No: but I can read the prescriptions.' Guardian: 'Did you do the compounding ever since you came here?' Nurse: 'Yes.' Guardian: 'Would you be willing to show another woman how to do it?' Nurse: 'I would do what I could.' With this Miss Shannon was appointed with an increase of salary, to combine the duties of instructor and compounder. She has already, it seems, though ignorant of Latin, been entrusted with the compounding of drugs for the workhouse, and is now in a position not only to continue the duty in the Fever Hospital, but to instruct another 'lady-doctor' to fill her vacated post."

We question whether a more "economical" organization of educational and examining machinery will be readily met with than this novel development of "home rule."

DUST.

THE propensity which matter has for getting into a wrong place and thus, according to the definition of a late statesman, becoming dirt, is manifest in a peculiarly troublesome manner to all shopkeepers; and at times when the existence of dry roads and boisterous winds is coincident, few suffer more inconvenience from this cause than pharmacists in towns. Many of our readers will, therefore, be glad to hear that a sensible mitigation of this nuisance may be effected by the adoption of a system of road watering, in which a solution of deliquescent salts is substituted for ordinary water. This system has already been practised successfully in some parts of

London. The material employed is known as Cooper's Patent Salts, and it is stated to have the additional advantage of preventing bad smells in streets. In a report of the Sanitary and Street Cleansing Committee of the Westminster Board of Works, it is stated that the saving in horse hire is more than sufficient to pay the cost of the salts. A further saving, in one hundred days, of 7,000,000 gallons of water, at 9*d*. per gallon, is estimated.

CREDIT TO WHOM CREDIT IS DUE.

In some remarks in the January number of the *American Journal of Pharmacy*, the Editor endeavours to arouse certain of those gentlemen who conduct similar periodicals to a proper sense of a failing that seems to be as common on one side of the Atlantic as the other. He says—

"Our predecessor in the editorial chair of this Journal has repeatedly been under the necessity of complaining of the disregard of journalistic right by several contemporaries, and we are constrained to reiterate the statements made by him at the beginning of the last volume, as applicable also for the past year, namely, that a number of original articles, translations and abridgements, furnished to this Journal, have been going the rounds under false colours. We respectfully suggest to editors the propriety of giving proper credit to the journal to which it may be due, even though but a paragraph or two may be clipped from our 'Gleanings,' 'Varieties,' or original matter. It has been our aim in no case to omit such reference."

We frequently have reason to complain of a similar unfairness. Translations of foreign articles and abstracts from English ones, prepared especially for this Journal, are continually appropriated, sometimes even without mention of the original source, and seldom with any notice of the intermediate one, although the articles bear internal evidence of having been taken bodily from our pages.

On Wednesday evening, at half-past eight, Mr. James Collins will read before the Society of Arts the paper on Economic Botany which was postponed on a former occasion, in consequence of the illness of H.R.H. the Prince of Wales. The chair will be taken by Dr. Maxwell T. Masters.

In a recent experiment made in the Botanic Gardens at Melbourne, some cinchona plants which had been placed in sheltered parts, have passed quite well through the cool season without any cover, although the temperature fell sometimes to several degrees below freezing. Dr. Mueller considers, therefore, that the cinchona might be successfully cultivated in the warmer and more sheltered woods of Victoria, and particularly instances one valley in the Dandenong ranges, where the temperature was still one degree above the freezing-point when the temperature at the Melbourne Observatory was twenty-eight degrees F. below it.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

February 7th, 1872.

MR. A. F. HASELDEN, F.L.S., PRESIDENT, IN THE CHAIR.

Present—Messrs. Atherton, Betty, Bottle, Carr, Frazer, Greenish, Groves, Hills, Mackay, Sandford, Savage, Shaw, Smith, Stoddart, Sutton, Williams and Woolley.

The minutes of the last meeting were read and confirmed.

The lot for the next Council having been taken in the usual manner, the following were declared to go out of office, but are eligible for re-election :—

Betty, Samuel C., 6, Park St., London, N.W.
Carr, John, 171, High Holborn, London, W.C.
Frazer, Daniel, 113, Buchanan Street, Glasgow.
Hills, Thomas Hyde, 338, Oxford St., London, W.
Shaw, John, 24, Great George Place, Liverpool.
Smith, Edward, 8, The Strand, Torquay.
Woolley, Geo. S., 67, Market St., Manchester.

The following members remain as members of the Council for the ensuing year :—

Atherton, John Henry, Long Row, Nottingham.
Brown, Wm. Scott, 113, Market Street, Manchester.
Greenish, T., 20, New St., Dorset Sq., London, N.W.
Haselden, Adolphus F., 18, Conduit St., London, W.
Mackay, John, 119, George Street, Edinburgh.
Sandford, George Webb, 47, Piccadilly, London, W.
Williams, John, 10, New Cavendish Street, W.

The following seven go out by rotation, but are eligible for re-election :—

Bottle, Alexander, 37, Townwall Street, Dover.
Edwards, George, Dartford.
Groves, Thomas B., 80, St. Mary Street, Weymouth.
Reynolds, Richard, 13, Briggate, Leeds.
Savage, Wm. Dawson, Upper Bedford St., Brighton.
Stoddart, Wm. Walter, 9, North Street, Bristol.
Sutton, Francis, Bank Plain, Norwich.

The Report of the Finance Committee was presented, showing on the General Fund Account a balance in the Treasurer's hands of . . . . £749. 8*s*. 9*d*.
On the Benevolent Fund Account a balance of . . . . £170. 13*s*. 5*d*.

The Report of the Finance Committee was received and adopted and sundry payments ordered. Mr. Howlett having completed the cases and table for the Museum, the sum of £58, as per contract, was ordered to be paid to him.

The Report of the Benevolent Fund Committee was received and adopted, and a grant of £10 made to the widow of a Registered Chemist and Druggist, late of Sunderland.

Resolved—That the list of subscriptions and donations to the Benevolent Fund be published monthly in the Journal and Transactions of the Society.

The Report of the Auditors on the Financial Statement for 1871 was received and adopted.

Mr. Woolley thought that, if a professional accountant were employed to draw up the annual Financial Statement, it might be put in a form more intelligible to the general members of the Society. A considerable discussion ensued, and it was ultimately pointed out by Mr. Bottle that, according to the provisions of the Charter, the auditors must be members of the Society.

Resolved—That the Registrar's Report, as now presented, be entered on the Minutes, and published in the Journal and Transactions of the Society.

REGISTRAR'S REPORT AS TO MEMBERS, ASSOCIATES AND APPRENTICES OF THE SOCIETY FOR THE YEAR 1871.

Members—Pharmaceutical Chemists.

Number of Subscribing Members, 1870	1802
" " restored, 1871	6
" " elected, 1871	63
	1871
Deaths, Secessions, etc. (see particulars below)	74
Total number of subscribing P. C. Members, 1871	1797

Decrease 5

Deaths, Secessions, etc.:—

Dead	29
Retired	16
Resigned	7
Emigrated	1
No notice, etc.	17
Bankrupt	1
Left	3
	74

Members—Chemists and Druggists.

Number of Subscribing Members, 1870	582
" " restored, 1871	1
" " elected, 1871	106
	689
Deaths, Secessions, etc. (see particulars below)	20
Total number of subscribing C. & D. Members, 1871	669

Increase 87

Deaths, Secessions, etc.:—

Dead	5
Retired	2
Resigned	2
Left	2
Medical	1
No notice, etc.	7
Life Member	1
	20

Associates in Business.

Number of Associates in business, 1870	82
" " elected, 1871	90
	172
Secessions, etc.	11
Total number of subscribing Associates in Business, 1871	161

Increase 79

	1870.	1871.	Increase.
Associates not in business	458	566	108
Apprentices	564	613	49

ANALYSIS OF EXAMINATIONS.

England and Wales, 1871.

Number of meetings for Major, Minor and Modified Examinations 22
Average attendance of the Board of Examiners . . . . 11·54

Examinations.	Number of Candidates during the Year.	Number of Rejections, etc. during the Year.	Number of Examinations during the Year.	Average number of Candidates at each Meeting.	Average number of Rejections, etc., at each Meeting.	Percentage of Rejections, etc.
Major	67	20	13	5·15	1·53	29·8
Minor	324	120	16	20·25	7·5	37·0
Preliminary	1101	387	4	275·25	96·75	35·0
Modified	163	60	4	40·75	15·0	36·8

Scotland, 1871.

Number of meetings for Examinations 7
Average attendance of Examiners . . . . 6·28

Examinations.	Number of Candidates during the Year.	Number of Rejections during the Year.	Number of Examinations during the Year.	Average number of Candidates at each Meeting.	Average number of Rejections at each Meeting.	Percentage of Rejections.
Major	3	0	3	1·0	0	0
Minor	47	17	7	6·7	2·4	36·17
Preliminary	62	10	6	10·3	1·6	16·12
Modified	27	7	7	3·8	1·0	25·9

THE REGISTER, 1871.

Additions during the Year.

Number of persons who have passed the Modified Examination		123
Minor " "		234
Major	50*	
Number of persons registered on payment of the registration fee, having been in business before 31st July, 1868		40
		397
Erasures		142
Increase of numbers on the register	255	

Erasures during the Year.

Deaths:—		
Notices from Registrars	57	
" " other sources	79	
		136
Erased by order of Council		6
		142

* These having already been included in the number who passed the Minor, do not increase the numbers on the Register.

Resolved—That the Report of the House Committee be received and adopted.

The Report of the Library, Museum and Laboratory Committee was received, recommending that the following books be purchased for the Library:—

Moquin-Tandon's Medical Zoology.
An English Grammar.
Supplement to Watts' Dictionary of Chemistry.
Gerhardt's Traité de Chimie Organique.
Wilson's Inorganic Chemistry. By H. G. Madan.
The Royal Institution. By Dr. H. Bence Jones.
Goodeve's Mechanism.
Bloxam's Metals.
Miller's Inorganic Chemistry.
Griffin's Algebra and Trigonometry.
Watson's Plane and Solid Geometry.
Maxwell's Theory of Heat.
Wurtz's History of Chemical Theory. By H. Watts, B.A.
Thomson and Tait's Elements of Natural Philosophy.

Also that to prevent interruption to the morning lectures by the late arrival of some students, a more stringent regulation as to signing the attendance book be made.

It was therefore resolved that in future the attendance book be closed at ten minutes after the time fixed for the commencement of the lecture.

The Registers of Pharmaceutical Chemists and Chemists and Druggists, and the Calendar of the Society for 1872, were placed on the table; also a proof copy of a pamphlet relating to the Benevolent Fund.

Mr. Hills presented two copies of the "Historical Sketch of the Progress of Pharmacy in Great Britain," published by the late Jacob Bell, accompanied by the following letter:—

"338, *Oxford Street, W.*
"10*th January*, 1872.

"*To the President and Council of the Pharmaceutical Society.*

"Gentlemen,—In looking through my library the other day I accidentally saw two copies of the History of Pharmacy, edited by my friend the late Mr. Jacob Bell, which I beg to present to the Society, together with the copyright, should it belong to me.

"I am, Gentlemen, yours respectfully,
"THOMAS HYDE HILLS."

The thanks of the Council were immediately voted to Mr. Hills.

Resolved—That the Report of the Parliamentary Committee be received and adopted.

Resolved—That the Report of the Evening Meetings Committee be received.

The sum of eight guineas having been granted in February, 1871, to the Norwich Chemists' Assistants' Association for purchasing diagrams, and the whole amount not having been required for that purpose, permission was granted to employ the balance in the purchase of books for the use of students.

Resolved—That Julius Schweitzer, being duly registered as a Pharmaceutical Chemist, be granted a diploma stamped with the seal of the Society.

Resolved—That the following Pharmaceutical Chemists be and are hereby elected Members of the Society:—

Amoore, Charles Robert ...... Battle.
Bradley, Charles .... Reading.
Saxby, Henry .... Lewes.
Waites, Edward William .... Tredegar.

Resolved—That the following Registered Chemists and Druggists be elected Members:—

Barton, Adolphus F. G. ...... Liverpool.
Blayney, Joseph Jarvis ...... Haslingden.
Clarke, Thomas .... Stockport.
Dawe, Joseph .... Freemantle.
Goggs, Nathaniel William .... Yarmouth.
Johnson, Robert Dodds ...... London.
Leach, Henry .... Riverhead.
Mandley, Wm. Ralph .... Teignmouth.
Mortimer, John.............. Bristol (Clifton).
Perry, Robert .... Gravesend.
Roberts, George .... West Bromwich.
Williams, William .... Coedpoeth.

Resolved—That the following, having passed their respective examinations, be elected "Associates in business":—

MINOR.

Butler, Charles .... Liverpool.
Dowson, Joseph .... Redcar.
Rodger, John .... Inverary.

MODIFIED.

Argue, James .... Hemel Hempstead.
Burgess, James Stanley ...... Salford.
Clark, Thomas Probert ...... Stourbridge.
Coldwell, David B. .... Peckham.
Feltwell, John .... West Kensington.
Hall, Samuel................ Littleborough.
Harrison, Joseph Painter .... Salisbury.
Herbert, William............ Lewisham.
Manfull, Horatio John ...... Nottingham.
Parsons, William .... Greenwich.
Peacock, George .... Kensington.
Powell, Walter Aitken ...... Swansea.
Slade, John .... Tenbury.
Turner, William Henry ...... Bristol.
Walker, Robert .... London.
Watmough, Henry .... Great Grimsby.
Williams, William J. .... London.

Resolved—That the following, having passed their respective examinations, be elected Associates:—

MINOR.

Burn, Henry................ London.
Brewster, William .... Royston.
Davison, John .... West Hartlepool.
Hall, Edwin .... Weston-super-Mare.
Hawley, William .... London.
Jones, Owen .... Llangefni.
Kendall, Edward Basnipp .... Nottingham.
Loggin, Charles Frederick, jun.. Stratford-on-Avon.
Rossiter, John .... London.
Shone, John .... London.
Simpson, John .... Lewes.
Springett, Normington ...... London.
Stocks, Charles .... London.
Taylor, Richard Eccles ...... Manchester.
Threlfall, Hugh .... London.
Townley, Thomas William.... Ambleside.

MODIFIED.

Abernethy, John .... Hinckley.
Bethune, John .... Belfast.
Blount, Frederick Charles .... Cheltenham.
Bromley, Edward........... London.
Hickman, Frederick.......... Southampton.
Jeffrey, Edwin Bassett ...... Tunbridge Wells.
Neale, Benjamin T. M. ...... Wellington.
Veitch, William, jun. .... Shildon.

REPORTS OF THE BOARD OF EXAMINERS.

January, 1872.

ENGLAND AND WALES.

Examination.	Candidates examined.	Candidates passed.	Candidates failed.
Major	3	1	2
Minor	25	12	13
Preliminary	229	132	97
	257	145	112

Certificates received in lieu of Preliminary, 4.

SCOTLAND.

Examination.	Candidates examined.	Candidates passed.	Candidates failed.
Minor	4	2	2
Modified	7	2	5
Preliminary	15	9	6
	26	13	13

Certificate received in lieu of Preliminary, 1.

LIST OF SUBSCRIPTIONS TO THE BENEVOLENT FUND, JANUARY, 1872.

LONDON.

	£.	s.	d.
Buckle, Christopher C., 77, Gray's Inn Road, W.C.	1	1	0
Churchyard, Robert L., 112, Camden Road, N.W.	0	10	6
Doubell, James, 17, Archer Street, W.	0	5	0
Huskisson and Sons, 77, Swinton Street, W.C.	2	2	0
Ince, Joseph, 10, Vigo Street, W.	1	1	0
Ive, William, Gloucester Road, South Kensington, S.W.	1	1	0
Orpe, Thomas M., 329, Old Kent Road	0	10	6
Owen, John, 234, Upper Street, N.	1	1	0
Rutter, Edward Yates, 35, Moorgate Street, E.C.	2	2	0
Samuel, Edward, 217, Edgware Road, W.	0	10	6
Shephard, Thomas F., All Saints Road, W.	0	10	6
Thompson, George A., 17, Archer Street, W.	0	5	0
Yarde, Giles, 60, Lamb's Conduit Street, W.C.	2	2	0

COUNTRY.

	£.	s.	d.
Arbroath, Milne, Patrick	1	1	0
Ashford, Ingall, Joseph	1	1	0
Barrow-in-Furness, Sansom, E.	0	5	0
Beverley, Richardson, John	0	2	6
Birmingham, Lucas, Joseph	0	10	6
Bradford, Blackburn, Bailey	1	1	0
Brighton, Robson, Thomas	0	10	6
,, Smith, W. H.	0	10	6
Bristol, Ackerman, T.	1	1	0
Burnham, Ellis, William	0	5	0
Cockermouth, Bowerbank, Joseph	1	1	0
Colsterworth, Wing, Samuel W.	0	10	6
Cranbrook, Sissmore, H. T.	0	10	6
Crickhowell, Christopher, William	0	5	0
Croydon, Clarke, Arthur H.	1	1	0
,, Stannard, F. J.	0	5	0
Diss, Thrower, Edward A.	0	10	6
Dorking, Clark, W. W.	0	10	6
Durham, Hunter, Frederick N.	0	2	6
Easthorpe, Mirfield, Crook, Charles	0	5	0
Edmonton, Jefferson, Thomas	0	10	6
Exeter, Delves, George	0	10	6
Fareham, Franklin, Alfred	0	10	6
Farnham, Higgins, William	0	10	6
Flint, Jones, Michael	0	10	6
Florence, Groves, Henry	1	1	0
Gravesend, Beaumont, William H.	1	1	0
,, Spencer, Charles	1	1	0
Guildford, Bingley, Frederick B.	0	10	6
,, Martin, Edward W.	0	10	6
,, Shepherd, George P.	1	1	0
Harleston, Muskett, James	0	10	6
Harrogate, Greenwood, John	0	10	6
Hartlepool, West, Cooper, S. H.	1	1	0
Heckmondwike, Booth, John	1	1	0
Hirwain, Sims, Joseph	0	10	6
Honiton, Turner, George	0	10	6
Hull, Hammond, W. H.	0	2	6
Landport, Tryon, William G.	0	5	0
Lee (Kent), Jarvis, John S.	0	10	6
Lewes, Saxby, Henry	0	10	6
Liverpool, S. M.	3	19	0
Longton, Prince, Arthur G.	0	10	6
Loughborough, Paget, John	0	5	0
Maryport, Cockton, John	0	5	0
Middlesborough, Sowerby, Richard	0	10	6
Needham Market, Harrington, A.	0	10	6
Nether Stowey, Ham, John	1	1	0
Netley, Borchert, H. T. G.	0	10	6
Newton Abbot, Poulton, John	0	10	6
Norwich, Arnold, Mrs.	0	5	0
Norwood (Upper), Prince, Thomas R.	0	5	0
Odiham, Hornsby, J. H.	0	10	6
Ore (Hastings), Neve, Francis C.	0	10	6
Otley, Pratt, Richard M.	0	10	6
Oundle, Turner, R.	0	10	6
Plymouth, Woods, William	1	1	0
Pontardulais, Hinds, H. D.	0	2	6
Portsmouth, Parsons, William	0	10	6
Reigate, Forbes, William	0	10	6
St. Day, Corfield, Charles	0	10	6
Scarborough, Smart, John	0	10	6
Shefford, Baigent, William H.	0	10	6
Shildon, Veitch, Thomas D.	0	10	6
Southport, Sykes, Thomas H.	0	10	6
Sowerby Bridge, Stott, William	0	10	6
Stockport, Shaw, A. H.	1	1	0
Tredegar, Waites, Edward W.	2	2	0
Tunbridge Wells, Sells, Robert J.	0	10	6
Twickenham, Bishop, Thomas	0	10	6
Wallingford, Payne, Sidney	1	1	0
Weymouth, Groves, T. B.	0	10	6
Winchester, Powell, Edward	1	1	0
Wyke, Drake, W.	0	2	6
Yeovil, Manning, Thomas D.	1	1	0

DONATIONS.

	£.	s.	d.
Kirkwall, Iverach, John G.	1	0	0
Wrexham, Edisbury, James F.	1	1	0

PHARMACEUTICAL MEETING.

Wednesday, February 7th, 1871.

MR. A. F. HASELDEN, F.L.S., PRESIDENT, IN THE CHAIR.

The following Donations to the Library and Museum were announced, and the thanks of the Society were voted to the donors:—

Medico-Chirurgical Transactions, Vol. LIV.: from the Royal Medical and Chirurgical Society,—Pharmacopœa Norvegica, Editio altera; Medicinal-Taxt for Norge, 1855, 1861 and 1864; Veterinair-Medicinal-Taxt for Norge, 1861–1864: from the Royal University of Norway,—Pharmacopœa Neerlandica: from Dr. J. E. De Vry,—Chemists and Druggists' Diary for 1872: from the proprietors,—Annals of Pharmacy and Practical Chemistry, Vol. I.; Thomson's System of Chemistry, 3rd edition, 5 vols.; Boerhaave's New Method of Chemistry: from Mr. G. W. Davids,—Rapport sur les Expositions Internationales de Pêche de Boulogne-sur-mer, Arcachon, et du Havre (1866–68): from Dr. J. L. Soubeiran,—Year-Book of Pharmacy and Transactions of the British Pharmaceutical Conference, 1871: from the Conference,—Report of Surgical Cases in the United States Army: from the Surgeon-General,—Bergin's Materia Medica, 1778, 2 Vols.; The Entire Works of Dr. Thomas Sydenham. By Dr. Swan. Second Edition. 1749: from Messrs. Dinneford and Co.,—Blindness and the Blind; or, a Treatise on the Science of Typhlology. By W. H. Levy: from Messrs. Taylor and Co.,—Report of the British Association for the Advancement of Science, 1871: from Mr. Bremridge,—Archives of Science and Transactions of the Orleans County Society of Natural Sciences. Nos. 1–3: from the Society,—Specimen of *Samaderine*: from Dr. J. E. De Vry,—Seeds of *Guilandina Bonduc*: from R. J. Friswell, F.C.S., of H.M. Eclipse Expedition,—Four Specimens of Soda Tartarata of Different Stages of Crystallization: presented by Messrs. Huskisson.

CURIOUS CRYSTALS OF CHLORAL HYDRATE.

Professor ATTFIELD said that there was one contribution on the table which was not mentioned in the list, for it had been sent by Messrs. Huskisson only late that day. It was a very remarkable specimen of cake chloral. It consisted of a few ounces of chloral hydrate in the bottom of a half-gallon jar, and from this small quantity there had grown out about twenty or thirty spear-like crystals, five or six inches in length. He had never before met with a specimen of chloral hydrate in that form. He had often seen crystals of chloride of potassium, sometimes an inch long, which had grown up from a mass of extract of sarsaparilla, and other medicinal extracts, and they had always appeared to be formed of superimposed cubes, as if one cube in crystallizing had pushed out the one before it, and thus produced a long square prism. A similar action, possibly assisted by sublimation, might have produced these remarkable crystals of what appeared to be chloral hydrate.

Professor Redwood said that the deposit on the upper part of the bottle presented very much the appearance resulting from the sublimation of camphor.

Mr. Umney said that it was just possible that those crystals contained a further amount of water than the ordinary water of constitution of hydrate of chloral. He had seen many specimens left in bottles, but he had never noticed any crystals like these.

Mr. Groves said that it had occurred to him that, as the bottle was only partially filled, the appearance might be the result of oxidation, or some such chemical action on the chloral.

Dr. Tilden said that it would be interesting to have the crystals analysed, in order to find out whether they consisted of a modification of chloral. Chloral was known to be trichlor-aldehyd; and aldehyd was well known to exist in at least three isomeric forms. These crystals might consist of an isomeric chloral.

Note on Tincture of Cinnamon.

A "Note on Tincture of Cinnamon, in connection with Mr. Haselden's paper, read at the last meeting," was communicated by Mr. Greenish.

[This paper is printed at page 641, and gave rise to the following discussion:—]

The President inquired, in reference to Mr. Greenish's statement that with a strong spirituous preparation the decomposition of tincture of cinnamon would be likely to occur, how long it was since the author made the preparation of tincture of cinnamon upon which he based his observations?

Mr. Greenish: I think quite two years.

The President said that was a considerable time; and if the preparation would keep two years, that was perhaps as long as could be expected. Not only did he agree with Mr. Greenish and Mr. Giles that the different strengths of spirit might be used with advantage for different tinctures, but he also thought that sometimes a different mode of applying the spirit and preparing the ingredients might be used with advantage. He might mention especially the tincture of calumba. Calumba was one of those roots which was with great difficulty exhausted, and it was also one that absorbed a large amount of the menstruum, of which there was a considerable loss in making the tincture. He had found (and he believed this method was approved by Professor Redwood) that it was better to slice the calumba than to powder it. But still he found that there was a difficulty in slicing it equally, and that with an ordinary root-cutter the substance would break off, and some pieces would be lump and thicker than they ought to be. Hence he had taken a portion of the distilled water which he should have used in making the proof spirit, and placed some of it over the calumba—the whole uncut root—and allowed it to remain for twelve hours. There was just sufficient water to cover the calumba, and the next morning he found that the substance was in a nice condition for slicing with the cutter,—neither too soft nor too hard. He found, also, that when the calumba was in that condition, the loss was considerably less upon the gallon of tincture than it was when either powdered or ordinary sliced calumba was employed. He believed that some process of that kind might be applied to other tinctures. Tincture of orange-peel was one upon which there was a great loss of menstruum; and he believed an improvement might be made in its preparation. He was not prepared at present to state exactly what the improvement should be, but he believed that the liquid might be applied to the orange-peel in a better way. He should be glad to hear remarks on the subject.

Professor Redwood said that he was sure the members were much indebted to Mr. Greenish for bringing forward this subject, and he (Prof. Redwood) should be glad if gentlemen, who, like the President and Mr. Greenish, were constantly and largely engaged in the preparation of this and similar medicines ordered in the Pharmacopœia, would give the Society a little more in detail the result of their experiences and observations. It had struck him (Prof. Redwood) that there were two points in connection with the subject which it was very important to keep separately before the mind. One was the occurrence of decomposition, and the other was the evidence of a decomposition. It seemed to him that all the inferences which had been formed with reference to the tinctures that had just been brought under their notice were inferences founded simply upon the obvious appearances which the tinctures presented to the eye; and in cases in which there had been some alteration or variation in the mode of operating, such as an alteration in the strength of the menstruum or spirit, it seemed to have been inferred, because there was no evidence to our senses of decomposition, that no decomposition had taken place. He thought that that was too violent an assumption. He was not at all clear that in cases where, in consequence of the use of a stronger spirit, there had been no deposition of insoluble matter, there had been no decomposition. The decomposition might have taken place, though the deposit had not been formed. That was a point upon which they required proof one way or the other. It was quite possible that the spirit had held in solution the product of decomposition which, if a weaker spirit had been used, would have given a muddy appearance to the tincture. If that were so, then there naturally arose another question,—Was there in such a case, or would there be, an advantage in the substitution of the stronger spirit for the weaker? He should be inclined to say, No. He would rather continue the use of the weaker spirit, and for this simple reason, that they wanted the tincture to be used in a definite condition. It might be a tincture which would not keep for more than a certain limited period; and if that were so, it ought to be used within that period, and not used beyond it. If it became muddy when the decomposition took place, that would preclude its use; but if by the use of a different menstruum—a stronger spirit—that muddy character was prevented, then there was an inducement to go on using the tincture when it was in an unfit state. In fact, it appeared to him that the case was somewhat analogous to that of oil of bitter almonds. Oil of bitter almonds in the purified state, freed from hydrocyanic acid, underwent a speedy oxidation. He would not say that this oxidation always occurred, for Dr. Tilden had shown them that if the oil were anhydrous, it might be kept without rapid oxidation; but in its ordinary state, when purified from hydrocyanic acid, it would oxidize quickly, and pass into the state of benzoic acid, which would crystallize in it; and, in place of the fluid oil, there would be a mass of crystals nearly filling the bottle, and they would at once indicate that there had occurred such a change as would preclude the use of the oil, or at least of the altered part of it. If, on the other hand, they had essence of bitter almonds instead of oil,—that is to say, if they had dissolved the oil previously in a certain quantity of spirit,—there was no longer such an indication as that.

There would be no deposition of crystalline matter, because there was present a menstruum (the spirit) which, as the benzoic acid formed, dissolved it. That seemed to him to be a somewhat analogous case to what possibly occurred in tincture of cinnamon. It was most desirable that there should be some experiments to indicate whether decomposition took place when external evidences of it were absent.

Mr. Greenish said that the cinnamon had absolutely gone out of the two preparations he had mentioned, or scarcely a trace of it was left, and, therefore, in the decomposition the cinnamon was evidently decomposed, and there was a very copious precipitate. When made with the stronger spirit, the compound tincture of cinnamon and the simple tincture had each a strong smell of cinnamon after having been kept for about two years. In every Pharmacopœia which he had consulted on the subject, except that of the United States, a stronger spirit was used—either six of spirit to two of water, or rectified spirit.

The President asked Professor Redwood what method he would propose to be adopted for ascertaining at what time chemical change commenced in tincture of cinnamon, and to what extent?

Professor Redwood said Mr. Greenish had just referred to one evidence which certainly went to show that the tincture made with the strong spirit had retained the cinnamon oil longer than the other, for the flavour of cinnamon still remained. What they would have to look for would undoubtedly be oil of cinnamon in the one case, and cinnamic acid in the other. As the oil of cinnamon disappeared, the cinnamic acid would be produced. But it was not easy to judge of the proportion of an essential oil in a strong solution of it, by the taste or smell. He had recently had evidence of this in the investigation of a subject allied to that before the meeting, and which he had intended alluding to in connection with the President's paper submitted to them at the previous meeting. One of the subjects referred to in that paper was syrup of tolu; and it was stated that in making that preparation the tolu did not become completely exhausted of the constituents which gave the peculiar character to the syrup. That was a subject of some importance to the pharmaceutist, and one, moreover, to which he had directed his attention, independently of its being brought forward in the paper. He had been requested to examine a specimen of balsam of tolu for the purpose of ascertaining whether it was genuine or not. He found clearly that it consisted of the resinous matter of the balsam of tolu answering to the reactions which that resin would give, but it was deficient in some of the most important constituents of good balsam of tolu, namely, cinnamic acid and the peculiar oily matter which gave to balsam of tolu much of its peculiar flavour. He concluded that it was balsam of tolu which had been used for making syrup, or for some similar purpose. In compliance with a suggestion made by Mr. Hanbury, he had used some of this partially-exhausted balsam for making syrup of tolu according to the Pharmacopœia, and compared the product with some syrup made with perfectly good and genuine balsam. Now, taking the syrups in the form in which he had produced them, he did not find it very easy to distinguish the one from the other; but if half an ounce of each of those syrups were put into a bottle and diluted with eight or ten times its volume of water, there would be no difficulty in distinguishing between them,—one solution being poor and vapid compared with the other. He should test the tinctures in a somewhat similar way. In examining the balsams, of course he should go to the quantitative determination of the proportions of cinnamic acid in them, as there appeared a probability that exhausted balsam of tolu might find its way into commerce. It was quite clear that something more was required than was at present given in the Pharmacopœia for the purpose of indicating what balsam of tolu ought to be. In the first volume of the Pharmaceutical Journal, Professor Soubeiran, of Paris, reported the results of experiments he had made in consequence of a statement that the same balsam of tolu might be used two or three times for making syrup without any deterioration in the quality of the product. Soubeiran came to the conclusion that, taking account of the proportion of balsam of tolu which was ordered, it could be used twice without deterioration in the product, but not more than twice. The proportion then ordered in the Paris Codex was one part of balsam to four parts of water. It was evident from the experiments of Soubeiran that a smaller proportion would yield a syrup equally good, and the proportion in the Paris Codex has therefore been altered to one part of balsam to ten of water. The proportion prescribed in the British Pharmacopœia is even less, being one to about thirteen, while in Russia the proportion remains at one to four. Having reference to the quality of this syrup, we could neither diminish the proportion of balsam ordered in our Pharmacopœia nor use exhausted balsam without injury to the product. There was a vast difference between syrup of tolu prepared according to the Pharmacopœia, and that which had been occasionally recommended, which was produced by putting tincture of tolu into ordinary syrup. Syrup of tolu, made according to the Pharmacopœia, was one of the most elegant, agreeable and successful of our officinal syrups. It contained a considerable quantity of cinnamic acid, while it derived the flavour of the balsam from the oily and resinous matter. On every ground it was important to maintain the character of that syrup, and in doing so those who made it must take care that they were not imposed upon with exhausted balsam.

Mr. Mackay said that he would refer to the analogy which Prof. Redwood had stated existed between tincture of cinnamon, when kept for a considerable time, and the remarkable change which took place in the oil of bitter almonds when freed from prussic acid and diluted with spirit. Some years ago a quantity of essential oil of bitter almonds was accidentally sent out in small bottles by a celebrated house in England and distributed throughout the length and breadth of the country under the name of "essence of bitter almonds," and a portion of the oil so labelled came into his neighbourhood and fell into the hands of an inquisitive servant girl, who swallowed fully a teaspoonful, the result being, he need scarcely add, fatal. The public mind then became very much alarmed about the use of the essence of bitter almonds in any shape, and the consequence was that a great many persons who had been engaged previously in the manufacture of essence of bitter almonds, determined to make their preparation free from prussic acid. He was amongst the number who determined to do so, and distilled very large quantities of the oil in the usual way over potash and lime, in which process, as a matter of course, he was successful in removing the prussic acid; but the effect when this oil was diluted with spirit was very much what Prof. Redwood had described: there was a considerable quantity of benzoic acid formed, more especially if the bottle happened to be exposed to the sunlight. But then came the peculiarity which he wished to notice, namely, that though there was a deposition sufficiently great to line the interior of the bottle with benzoic acid, there was not an absence of flavour. There was so much of the peculiar flavour of bitter almonds left that the compound was used freely for domestic purposes, and in the only cases in which parties refused to use it, the refusal was due more to the unsightly appearance of the liquid than to the positive absence of flavour. Now he was told by Mr. Greenish in reference to the decomposed tincture of cinnamon that the flavour of the cinnamon had been entirely destroyed.

Mr. Greenish: Almost.

Mr. Mackay: Well, that was not the case in the decomposed bitter almonds, and in that respect the analogy between the two had failed.

Dr. Attfield: Surely the flavour of the almonds was not present to the same extent?

Mr. Mackay: No; but it was sufficient to enable it be used for flavouring purposes.

Mr. Allchin said that his experience totally differed from that of Mr. Mackay. There was no doubt that essential oil of almonds deprived of prussic acid would dissolve rapidly in spirit, but the spirit, whatever its strength, did not prevent the oxidation going on; and as that proceeded, the flavour was gradually destroyed, until it entirely disappeared and nothing but benzoic acid was left.

Mr. Martindale said that he believed with regard to many proof-spirit tinctures, besides those which Mr. Greenish had mentioned, it would be desirable to increase the strength of the spirit employed; for instance, in the case of the tinctures of the leaves of plants indigenous in this country, such as hyoscyamus, belladonna and digitalis. He believed that proof-spirit took up a quantity of matter which was comparatively inert, and that a stronger spirit would be preferable. As a rule, it was not found that the tincture made with the stronger spirit gave any deposition at all; for instance, arnica and aconite. Although, of course, as Dr. Redwood mentioned, the changes might occur without being perceptible, still his own experience did not lead him to that opinion. Another point to which he would draw attention was the proportion of the ingredients to the quantity of spirit ordered. Taking the specific gravity of many tinctures which he had made, he found that in making them by percolation, very little more than weight by weight to the ingredients, as in the case of the green plants which he had mentioned, would almost completely exhaust them. In making two gallons of tincture of hyoscyamus by percolation, he found that after the first 40 ounces were obtained, the specific gravity of that which passed afterwards was little above that of the spirit used.

Mr. Groves said that he differed both from Mr. Mackay and Mr. Allchin as to the essence of almonds. He had used nine volumes of alcohol, and he found that he might keep the solution twelve months without its either depositing crystals or losing flavour. It was very likely that Mr. Allchin's essence was made with a smaller proportion of alcohol.

Mr. Allchin said that he used about one to twelve.

Mr. Groves said that the preservative influence of rectified spirit was probably due to the abstraction of water. That would equally apply to oil of almonds and tincture of cinnamon. He thought that the fact of Mr. Greenish's tincture retaining its odour must be accepted as a proof that there was certainly no great amount of oxidation. He believed that the effect was entirely due to the spirit retaining the water and preventing the oxidizing action from taking place.

Mr. Allchin asked whether Mr. Groves thought that the quantity of spirit deterred the oxidation.

Mr. Groves said he did not. It was the strength of the spirit.

Mr. Allchin said that his opinion was quite different.

Mr. Umney said that if the essential oil of almonds were diluted with nine parts of alcohol, the amount of benzoic acid produced, even by the total oxidation of the oil, would be entirely soluble in that quantity of alcohol. He could not understand how a deposition could take place in the way described by Mr. Mackay. He (Mr. Umney) could corroborate the experiments which Dr. Tilden made three or four years ago. He had found that two or three pieces of chloride of calcium, placed in a quantity of essential oil of almonds freed from prussic acid, took up the water, and the oxidation afterwards did not take place as rapidly as under ordinary circumstances.

Mr. Williams said on one occasion he had an opportunity of inquiring of Dr. Hofmann the probable effect of alcohol on oil of bitter almonds in preserving it. Dr. Hofmann had had presented to him some oil of almonds in which there was 23 per cent. of alcohol. The makers said that they put the spirit in for the purpose of keeping the substance; but the doctor did not like it, and he pointed out that so far from keeping it, it was a very injurious addition. Prof. Redwood had mentioned balsam of tolu. He (Mr. Williams) should like to know whether he would take the quantity of cinnamic acid as the standard for the quality of balsam of tolu. That was only one ingredient and a small one. There was another question involved, which was the strength of the spirit. It was simply a question whether spirit really kept a tincture, or whether decomposition went on just the same, the spirit simply dissolving the resulting product. There was no evidence at present to prove that when the strong spirit was used, decomposition took place. That, of course, was an open question, and one which ought to be clearly defined.

Mr. Groves said that many years ago he found that, in dispensing, on adding liquor potassæ to syrup of tolu, prepared according to the Pharmacopœia, a jelly was formed after a time, so firm that the bottle could be inverted without the contents running out. He should like to know how that was occasioned.

The President said that he should have liked to make some remarks on the subject, but it would be better to proceed to the other papers.

A "Note on the Longouze of Mauritius" was read by Mr. Daniel Hanbury, F.R.S.

[This paper is printed at page 642, and gave rise to the following discussion:—]

Mr. Collins said that about eighteen months ago a specimen, labelled "grains of paradise," was shown him in Mincing Lane. It came from the west coast of Africa. It had the appearance of one of the so-called millets, and would not pass muster in the market. He believed it to be identical with what was described by Mr. Hanbury.

Dr. Tilden asked to what species Mr. Hanbury finally referred the plant.

Mr. Hanbury said that Sonnerat's name, *Amomum angustifolium*, displaced all the other names.

A paper on "The Separation and Quantitative Determination of the Cinchona Alkaloids," by Dr. J. E. De Vry, was read by Dr. Attfield.

[The paper is printed at page 642, and gave rise to the following discussion:—]

Mr. Williams said that the paper was a most important one, but it would be very difficult to enter into a discussion upon it at once. It would require much thought, and was fitted for study rather than discussion. It was one of those papers which seemed to mark definite steps in the progress of scientific investigation.

A paper by the same author, on "*Samadera Indica*," was read by Dr. Attfield.

[This paper is printed at page 644, and gave rise to the following discussion:—]

Professor Attfield said that the bark mentioned in the paper was one of the two substances alluded to in a paper by Mr. Cooke, entitled "Two Medicinal Barks from Ceylon," which appeared in the Journal of January 6th. He exhibited Dr. De Vry's samaderine to the meeting, and said that as there was no evidence of its being an alkaloid, it would be well to drop the final *e* in its name. *Samadera* belonged to the same Natural Order as *Quassia*, but the bitter principle of *Quassia* did not colour sulphuric acid; neither did strychnia, which also was excessively bitter; but samaderin coloured it very beautifully (Professor Attfield here showed by experiment). The tint was the same as that produced by a mixture of sulphuric acid and red chromate of potassium, or of other oxidizing agents on strychnia, namely, a delicate purple, and was less fugitive than the colour produced by strychnia. Fuming sulphuric acid also produced the reaction. Neither ordinary nor fuming nitric acid gave any colour with samaderin; hence it appeared that this substance was quite different from the bitter principle of *Quassia*, the allied plant.

Mr. Collins said that Dr. De Vry had directed attention to the important fact that the fruit was much better than the bark. This should be remembered, because the trees were being destroyed in Java and other places for the sake of the bark.

The President said that he was not aware that this bark had ever been introduced into England before, though in India it was used as a febrifuge, under the name of Niepa bark.

With regard to the taste of samaderin, Dr. Attfield said that, to his palate, the solution of that substance was more bitter than a corresponding solution of sulphate of strychnia.

Mr. Umney remarked that the taste resembled that of *Quassia;* and Mr. Williams drew attention to the fact that this substance did not produce that peculiar bitter taste at the back of the mouth which was so characteristic of strychnia. It appeared to be a clearer bitter.

The next meeting was announced for March 6th.

NORTH BRITISH BRANCH PHARMACEUTICAL SOCIETY—EDINBURGH MEETING.

The Third Meeting of the present session took place in Craigie Hall, on Wednesday evening, January 1st, at 8.30; Mr. Ainslie, in the unavoidable absence of the President, in the chair.

Mr. Paton read the following paper on "The Museum: its Position and Requirements:"—

The present time—when the Council of the North British Branch contemplates a complete reorganization of its whole establishment, and is engaged in seeking suitable premises as head-quarters for Scotland—offers a very favourable opportunity for drawing the attention of members to that most important feature of the institution—the Museum. It is the one feature which must enter largely into all considerations regarding suitable premises, for, whereas a considerable collection of books is not difficult to accommodate so that it may be made available to readers, and the necessities of the Board of Examiners have already made themselves evident, the museum, on the other hand, cannot, unfortunately, be said to figure in a manner that makes the disposal of the specimens it at present contains a matter of very serious concern. It is therefore now the more essential that the Society should have before it, not what the Museum is, but what it ought to be, and what members are resolved to make it. It appears to me that the future position of the North British Branch will, to a great extent, be determined by the importance and value of the Museum collections it may establish.

Before referring to the present position of the Museum, permit me to make one remark on the general question. There are museums and museums; such institutions may be classed in ascending series, from penny peep-shows up to the British Museum. Leaving out of account the lower members of the series, museum collections may be divided as to their functions into three classes. Firstly, they serve for general popular instruction; secondly, they provide stores for the strictly technical and scientific student; and thirdly, their collections provide material for the advancement of scientific knowledge, and for devising new applications and uses of known principles and substances, as well as the discovery of the value of what may hitherto have been unapplied. The museum of this branch, it will be seen, does not fall to be considered at all under the first head, and very little under the third; its first and chief object is to provide full and efficient means of instruction in the professional department of pharmacy. Being thus not intended in any degree as a popular resort, the necessities of the museum, in the way of good light and cases and ample space for exhibition, are by no means so great as are the requirements for a full series of typical specimens, arranged in the manner that an orderly-minded student should prosecute his studies. In this way, also, large and striking specimens are not so desirable as such as are truly characteristic and most faithfully represent those substances the qualities of which they are intended to exhibit. The Society, therefore, can save money upon show-cases and fittings, which it might properly expend upon providing that such cases as it may have shall be well filled.

At the time I was first appointed to the charge of the Museum, and when the printed list of specimens was prepared, there were in the collection about 120 specimens of chemical substances, over 340 examples of vegetable materia medica, and of animal products only 24 specimens. The great bulk of these specimens had been presented by friends of the museum in this locality; but among them there are some collections of considerable value, which had been sent from a distance. Among these, as of special value, ought to be mentioned the complete series of the cinchona barks of commerce, presented by Messrs. Howard and Kent, and a fine series of chemicals, presented by Mr. W. Heathfield. The museum has also been indebted to Professor Archer, of the Museum of Science and Art, for a series of the Magdeburg salt-mine minerals and other specimens, and Sir Robert Christison and Professor Douglas Maclagan have frequently shown their good-will by presenting excellent specimens. It is manifest that with such a limited series of specimens, no great amount of arrangement would be required, and the one difficulty they occasioned, was the impossibility of grouping them in any systematic shape. No such grouping has, therefore, been attempted further than separating the chemical, animal and vegetable substances; and these, with a little further breaking down, have been arranged in a highly arbitrary manner. It was judged that to attempt a botanical classification of such an incomplete series of vegetable substances would be of no practical value. Since the list was printed several valuable acquisitions have been made, among which are a very interesting and complete illustration of the metal thallium and its salts, from Messrs. Hopkin and Williams, and a series of dried native plants prepared and presented by Mr. Ransom, of Hitchin, which may form the nucleus of a herbarium collection,—a very desirable feature for such a museum as that of this Society.

What it is desirable to aim at in the Museum I have already to some extent hinted. The first and most pressing duty of the Society here is, as possessed of an examining board, to provide the most ample means possible for facilitating the professional education of the candidates who come up for examination. It is evident that it is both unfair and unwise to examine men on subjects and regarding substances they have no means of becoming practically acquainted with. The Museum cases should illustrate all these as far as possible, and means should be taken to let it be known that such facilities for acquiring knowledge exist. But the acquisition of specimens should not cease with the fulfilment of this object, any more than the studies of the pharmaceutist should end with passing his examinations. As the lesser examinations only represent the minimum of knowledge considered indispensable for the qualification of members, so such a collection would indicate the very least number of specimens that could be looked upon as a museum collection. It would, indeed, be very difficult to point to anything in the vegetable kingdom which would not find a suitable place in a pharmaceutical museum; and all forms of models and apparatus for teaching botany or for illustrating it as a science, would be of great value in such collections, having primarily an educational aim. Diagrammatic illustrations of botany, collections of dried and mounted plants and models of the more perishable fruits and other products, could all find place in the Museum at little cost and with great benefit to those consulting it. In the same way illustrations of chemical apparatus and processes would have a high value, as well as all chemical substances, even although not of present value in pharmacy.

In short, it is wished to make this plain to the Society, that although there exists an excellent nucleus round which the museum may form, the collections are but in a state of infancy, and capable of almost indefinite extension, at very little expense to the funds, and requiring no excessive exertion on the part of members, if a considerable number are willing to take a share in procuring contributions. Scarcely anything can come amiss to a museum with such a limited stock, and where many of the specimens have been exposed to the tear and wear of twenty years, and in that time have done duty as terrors to generations of candidates for pharmaceutical honours. But although all manner of specimens would be welcome, it is most desirable that some systematic attempt should be made to get a complete set of typical specimens in the first place; and while the interest of all in procuring specimens should be stimulated, some one should see to make application in special directions for desiderata that may be supplied therefrom.

I believe the museum of the parent Society in London could do much towards supplying many of the wants of the Edinburgh museum; and, on the principle of helping first those of our own household, it should be prepared to do so. I do not say this from personal knowledge or inspection of that museum, but rather from what I know of the manner in which all such institutions grow, and the accumulation of duplicate specimens that burden them in spite of themselves. Besides, as small quantities only are required for such collections as that here, those can often be spared without detriment to the parent specimen. Doubtless, if the goodwill and interest of the authorities in charge of the London museum were secured, and sanction procured to hand over duplicates to this museum, it would be a good investment to have some one on the spot to select, pack and dispatch such of their stores as they might be willing to yield up. At any rate this is a matter worthy of attention.

I trust the North British Branch may soon be established in quarters worthy of its position, and that it may have both a library and museum of which its members will justly be proud, and that with these it may go on in a career of advancement and extended usefulness yet undreamt of in its annals.

At the close of the paper the Chairman, in proposing a vote of thanks, made some remarks upon the present position of the Museum, and hoped that ere long better accommodation would be procured for this department of the Society.

Mr. Mackay, in seconding the motion, reminded the meeting that the Council in London had already passed a resolution in reference to obtaining better rooms than those at present in use for meetings, examinations, and the operations of the Society generally. He further impressed upon all present, that as this was now the season of the year when likely accommodation might be obtained, the Council here would be glad to have their attention drawn to anything suitable or worthy the attention of the Society.

Mr. W. Gilmour then read a paper on "Volumetric Analysis," which we purpose printing in a future number.

The paper was very fully illustrated by diagrams and experiments.

Mr. Nesbit, of Portobello, proposed that a vote of thanks should be given to Mr. Gilmour for his very interesting and instructive communication, and, while he agreed in the results so ably brought out, could not but express his regret that a process so simple and effective should be so little employed, as he believed it was. Mr. Nesbit trusted that ere long Mr. Gilmour might be induced to continue his experiments, and give the Society another paper on the same subject.

The Chairman seconded the motion, and in conveying the thanks of the meeting to Mr. Gilmour, stated how much he had been pleased with the manner in which volumetric analysis had been brought before the meeting.

The Secretary laid on the table the 'Year-Book of Pharmacy,' the January number of the *Chemist and Druggist*, and the Nov.-Dec. number of the *Pharmacist* from Chicago, all presented to the library.

Provincial Transactions.

LEICESTER CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

The half-yearly Meeting of the above Association was held at the Rooms, on Thursday, February 1st; Mr. W. Thirlby in the chair.

The Treasurer, Mr. W. B. Clark, in reading his report, drew attention to the much improved state of the financial affairs of the Society. The receipts during the session have amounted to £33. 12*s*. 2*d*., and the expenditure to £24. 19*s*. 8*d*.; a balance of £3. 17*s*. 4½*d*., which remained due to the Treasurer at the commencement of the session, being thus converted into a balance in hand of £4. 15*s*. 1½*d*.

Mr. W. B. Blunt, the Hon. Sec., then read the following Report:—

"During the session, ten papers have been read by gentlemen connected with the Association. Classes have been held regularly for the instruction of the members in chemistry, botany, materia medica, and in the reading of prescriptions, whilst a preliminary class has been conducted by Mr. Walker, with great success. In the course of the half-year, thirty-four apprentices and assistants have been members of the Association, which is very satisfactory to the Committee, being an increase of about thirty per cent. of the numbers during the previous session. Finally, the Committee in closing their report at this, the end of a very successful half-year, ask the attention of the principals to the fact, that to enable their *employés* to reap all the benefits the Association can confer; material aid would be given by the adoption of the custom of many other important towns, viz. of closing their shops not later than eight o'clock. The Committee ask for the support of the principals in the attainment of this desirable object."

The following officers were then elected:—*President*, Mr. W. Bradley, A.P.S.; *Vice-President*, Mr. S. H. Cadoux; *Treasurer*, Mr. W. B. Clark, P.C.; *Hon. Sec.*, Mr. W. Thirlby, A.P.S.; *Committee*, Messrs. E. H. Butler, A.P.S., W. T. Elkington, and E. J. Bishop.

A programme has been issued of lectures, classes, etc., meeting at 8.40 P.M., which extends to August next.

MANCHESTER CHEMISTS AND DRUGGISTS' ASSOCIATION.

The Fourth ordinary Monthly Meeting of the session was held in the Memorial Hall, Albert Square, on Friday evening, Feb. 2nd; Mr. W. Wilkinson, Vice-President, in the chair. The attendance was unusually large.

Mr. W. Lane (an Associate) read a good practical paper on "Dispensing." The paper gave rise to considerable discussion, in which several Associates, as well as Members, joined.

Mr. Wilkinson's remarks on the "Preparation of Lard for Pharmaceutical Purposes" were postponed, in consequence of the lateness of the hour.

Parliamentary and Law Proceedings.

Croydon County Court.—*Monday, 5th February*, 1872.
Before H. J. Stonor, Esq., *Judge.*
The Pharmaceutical Society *v.* Harrington.

This case had been by the Judge adjourned until this day.

Mr. Lucas (from the office of Messrs. Flux), on behalf of the plaintiff, informed the Judge that the defendant had not made payment into court or procured himself to be placed on the register, and therefore he (Mr. Lucas) asked judgment for the penalty.

An attorney appeared on behalf of the defendant, and pressed that his Honour would not give judgment, inasmuch as Mr. Bremridge's appointment as Registrar had not been proved; and the defendant now alleged a good defence to the action under the seventeenth section of the Act, which section provides that the business of a "wholesale dealer" in drugs shall not be affected by the Act.

The Judge said that any contest that the transaction was one of "wholesale dealing" was out of the question; the quantity supplied was "one pennyworth," and if the sale of a pennyworth in Croydon could be described as wholesale, it would be difficult to say what might, in a village, be a retail transaction. And with respect to the other question, the objection should have been taken "as a ground of nonsuit" before entering on defence by the defendant. However, if the defendant were dissatisfied, he might, on affidavit properly prepared and sworn to, move for a new trial. His judgment was for the plaintiff. Verdict for £5; costs of attorney and witnesses; execution to issue in a fortnight.

Poisoning by Laudanum.

On Wednesday, Feb. 1st, an inquest was held at Wakefield upon a young man named James Quarmby. It was stated in evidence that the deceased, who had been suffering from pains in the stomach, had obtained an ounce of laudanum from his cousin, Mr. Quarmby, chemist and druggist, Westgate, and the bottle was afterwards found in his pocket, properly labelled. Deceased was discovered in an insensible state, and died without being roused. Medical evidence was given that the symptoms indicated poisoning by repeated small doses of laudanum, and a verdict was returned to that effect.

BOOKS RECEIVED.

A Dictionary of Chemistry and the Allied Branches of other Sciences. By Henry Watts, B.A., F.R.S., F.C.S. Assisted by many Eminent Contributors. Supplement. London: Longmans, Green and Co. 1872. From the Publishers.

Jahresbericht über die Fortschritte der Chemie und verwandter Theile anderer Wissenschaften für 1869. Giessen. 1871.

The following journals have been received:—The 'British Medical Journal,' Feb. 3; the 'Medical Times and Gazette,' Feb. 3; the 'Lancet,' Feb. 3; the 'Medical Press and Circular,' Feb. 7; 'Nature,' Feb. 3; the 'Chemical News,' Feb. 3; 'English Mechanic,' Feb. 2; 'Gardeners' Chronicle,' Feb. 3; the 'Grocer,' Feb. 3; the 'Journal of the Society of Arts,' Feb. 3; 'Journal of Materia Medica' for December; 'Philadelphia Medical and Surgical Reporter,' Nos. 770–773; 'Journal of Applied Science' for February; 'The British Pharmacist' for February; 'The Wakefield Press,' Feb. 3; 'Journal of the London Institution' for February; 'Transactions of the Odontological Society' for January; 'British Journal of Dental Science' for February; 'Journal de Pharmacie et de Chimie' for January; 'Food, Water and Air,' for February; 'American Chemist' for January; 'The Clinic' (Cincinnati) for January.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Pharmaceutical Education.

Sir,—If by "matters political" your correspondent, Mr. Ernest J. T. Agnew, refers to pharmaceutical politics, Manchester is quite able and willing to bear the sneers which in all time it has been the privilege of the defeated to throw at the successful party; if to national politics, the subject is scarcely a suitable one for discussion in your columns. Still, Manchester has little need to be ashamed of her "reputation," and, in the experience of much older and more experienced persons than Mr. Agnew, it is not an "unenviable" one.

Manchester pharmacists have been actuated, both in pharmaceutical politics and in questions of pharmaceutical education, by honest convictions. They are not, therefore, likely to be much discomfited by "obnoxious epithets," whether couched in plain English or in elegant French.

I am surprised that any one possessing ordinary ability to appreciate an argument, to say nothing of the varied accomplishments which Mr. Agnew implies to be his, should so far misunderstand the general tone of Mr. Siebold's lecture, as to consider it reactionary even in the one particular of "botany;" and surely it is unjust to taunt Manchester on opinions expressed by one citizen.

In what way the questions for the Preliminary, with the percentage of candidates who failed to answer them satisfactorily, "prove the most striking answer to Mr. Siebold's complaints," I fail to understand.

We are, as yet, unable to bring to our examinations young men sufficiently educated to meet our present requirements. They are, therefore, argues Mr. Agnew, below "lower third form boys in any public school." If we add to our requirements "geometry," "algebra," "mineralogy," "geology," "zoology," "Greek," the extraction of square and cube roots, the laws of arithmetical, geometrical and harmonical progression and logarithms," with "French or German," the percentage of unsuccessful candidates will be discoverable without much calculation. Of course, no one doubts the value which knowledge of these subjects proves to the possessor, be he a pharmacist or anything else. But so also does a knowledge of astronomy, physiology, common law, metaphysics, political economy, Sanskrit and a thousand other subjects, though we may doubt the absolute necessity of such knowledge for the proper discharge of our duties to the public. I am only surprised that Mr. Agnew does not insist upon many other branches of education, when I find him placing geometry as one of the "two most important preliminary studies, and the most useful in rendering intelligible the rudiments of chemistry."

Our first care, as it seems to me, must be to secure for our trade the services of men possessing those qualifications and acquirements which experience has shown to be necessary. Let us decline to take apprentices until they have passed the Preliminary as it now stands, and let us persevere in the establishment of schools of pharmacy throughout the country. This will occupy us all for the present, and be better than visionary projects of making "Admirable Crichtons" of us all.

Mr. Agnew's scheme of converting Bloomsbury Square into a botanical garden is certainly a bold one. He wisely abstains from giving too many details of his plan, but Mr. Agnew's extended information will doubtless enable him to preserve his medicinal and "subtropical or brightly-coloured plants" from those atmospheric influences which render the foliage of the existing plane-trees "smoky" and the grass "dingy." By the bye, I am glad to hear that castor oil is now obtained from a species of palm in addition to its usual source.

I do not profess that skill in English composition of the value of which Mr. Agnew has had such "abundant pecuniary proof." I will not, therefore, trouble you with remarks on other portions of his letter. I would, however, strongly recommend Mr. Agnew to adhere to two very admirable rules when writing his next epistle,—1st, to take care to understand the subject he has to write about; and, 2nd, to keep to the matter in hand, and avoid those discursive flights which serve only to confuse and mislead.

In conclusion, I take this opportunity of suggesting what late experience has proved to be rather a pressing want, viz. that classes be formed in all towns for elementary instruction in the requirements of the poison clauses of the Pharmacy Act, and that coroners and country magistrates be admitted at reduced fees.

Feb. 5th. "A MANCHESTER PHARMACIST."

Sir,—After reading Mr. Siebold's lecture, I was quite prepared for any strong remarks that might subsequently be made thereon; unquestionably he has challenged the whole pharmaceutic body,—a foolish thing to do, as he appears incapable of accepting criticism in any other way than as a personal affront towards himself. Mr. Keen has commented on the lecture severely, perhaps rather too much so; still, making allowance for a little extravagance in the use of adjectives,—caused, doubtless, by honest indignation,—it is on the whole thoroughly well deserved, and it is a pity Mr. S. has so evidently allowed his wrathful feelings to overcome him in his reply. Without going so far as to say that "absurdities and inaccuracies abound," still we are told to accept, on this sole authority, such startling statements as facts,—statements that are so contrary to common sense, to the experience of our daily lives, and to the ideas that years and the wisdom of others have engrafted on our minds, that it is not inexcusable to style them as absurd. One example of these is quoted in Mr. Keen's letter, others are to be found throughout the lecture.

In reply to Mr. Keen, Mr. Siebold says that he recommends the B. P. to students as a text-book on subjects of practical pharmacy, so he does the prescription-book, and "his own practical knowledge," but the recommendation is given so superficially as to be almost worthless.

The introductory remarks as to general study and the acquirement of a knowledge of chemistry and materia medica, are such as will commend themselves to thoughtful and practical men, but following these is an assertion by no means flattering to the medical profession, for we find "that but for our knowledge and care in detecting doses of poisons, hundreds of human lives would be sacrificed every year by the errors of medical men's prescriptions." Probably this sensational statement is one of those that called forth Mr. Keen's denunciation as "inaccurate and absurd."

With regard to botany, as a subject for pharmaceutical students, I think it is worthy of much more regard than Mr. S. is disposed to accord it; he places it in the same category as astronomy, anatomy, etc., interesting, instructive and cultivating to the mind; these sciences, however, have no bearing, near or remote, on those branches of knowledge we must acquire in order to become skilful pharmacists. Botany has a very close connection with our pursuits, most of our remedies being obtained from the vegetable kingdom, and as we are expected to be well acquainted with the nature and properties of such as are derived from the inorganic, surely it is not too much to expect that we should be possessed of a little more than routine knowledge of those from the vegetable world; that we should know something about their growth, structure, anatomy and classification, something of the arrangements and distinctions of such of the Natural Orders as come more immediately under our notice. I do not say that an intimate knowledge of systematic and structural botany is essential, but I do say that a sound general knowledge of it is a great advantage to a practical pharmacist. If we come to bare essentials only, then what necessity is there for chemistry and materia medica? Many businesses have been, and are now carried on successfully without a knowledge of those important items; still, he who is well up in them, or in other words, he who has a large amount of useful information bearing on that profession by which he hopes to live, stands a better chance of succeeding than he who has very little or none. I, for one, would regret exceedingly, if the standard of our education were to be lowered by removing from the examination all subjects but those barely essential to carrying on business, by such a proceeding we should be completely stultifying ourselves. From the foundation of the Society has not the cry been "excelsior"? and shall we now fall back into the ranks of mediocrity? I trust not. If such is to be the standard of fitness, what is the use of the Minor examination? Better abolish it altogether and substitute the Modified, which seems to be the beau ideal of Mr. Siebold's fancy, for assuredly that includes nothing but bare essentials.

The innuendoes against the ability and fairness of the examiners come with a bad grace from one professing to be a teacher of pharmacy, and they are calculated to give one the idea that Mr. Keen is very near the truth in his suggestion as to the better preparation of the London students than those from Manchester. The statement, that "not unfrequently able and thoroughly qualified men fail, and that others, though quite incompetent, succeed" is, to say the least, very reckless; and I have no hesitation in saying, it is entirely unsupported by facts. As regards pharmacy, this examination, we are told, "deserves to be called worse than useless." This opinion, I think, can hardly extend beyond those "able and thoroughly qualified men" who so frequently fail in passing; in my opinion it is a useful test as to a man's practical knowledge of his business; and if he is unable to distinguish most of the galenicals of the B. P., and show that he is familiar with the constitution of its most ordinary compounds, I, for one, should be inclined to think he did not know very much of his business. Is there so little difference between extracts of henbane, hemlock, opium, aloes, cannabis indica, etc., or, tinctures of opium, myrrh, rhubarb, lavender, etc., that the sense of smell is the only one brought to bear on their distinctions? What estimate should I form of the abilities of an assistant who had to turn to the Pharmacopœia every time lin. opii, lin. ammon., pil. coloc. c. hyoscyam., dec. cinchon., and similar preparations appeared in a prescription; or who, in case of morphia, strychnia, gum acacia or sugar being ordered in a mixture, could not use the proper quantity of their solutions? Surely a man ought to be well up in the nature and composition of those things amongst which he is engaged in making and using, day after day and year after year. I have no hesitation in saying, that an apprentice who has spent five years in an average dispensing establishment, should be able to pass this section of the examination any time after his indentures are out, or I should say he had wasted his opportunities. I cannot think that "the inability to recognize tinctures and extracts," which is so great a grievance to the teacher, "has proved fatal to many a student," it is some other inability, or combination of them, that has stood between him and success; for, if he was "provided with more than ample knowledge of chemistry and materia medica," it is not alone inability to recognize a few pharmaceutical preparations that has put him back, the cause must be sought a little further.

Who does Mr. S. mean when he says, "What we want, and what we have a right to demand, is," etc.; and to whom are the botanical and pharmacy examinations "an intolerable burden"? Is he speaking in the name, and expressing the opinion of the pharmacists generally, or only those of the "Manchester school"? If the former, it is presumption on his part; if he is the mouthpiece of the latter, all well and good.

There remains yet the dispensing section, with which Mr. S. is not pleased, and gives it as his opinion that "an examiner cannot possibly judge of a dispenser's abilities by seeing him prepare a single prescription." I believe this examination to be useful, because I honestly think the examiner can form a tolerably exact opinion of the candidate's dispensing abilities by seeing him prepare even a single prescription; he can see how he goes about his work, how he handles his tools, and in what order he mixes his things, quite sufficient to perceive whether the candidate is an experienced hand or only a bungler. Then, again, in the reading of prescription directions; what is the use of examining a student on the most ordinary and simple example alone? You want to find out whether his knowledge is but routine, or something beyond that; if he is thoroughly conversant with his subject, or if he will break down directly he gets out of the depths of simplicity, and if his stock of knowledge will enable him to assign a correct meaning to an obscure word or phrase.

I feel assured that Mr. S. will not, at least in the opinion of the majority, have "succeeded in pointing out the main causes which lead to the failure of many well-qualified men," far from it; if assertions resting solely on his *ipse dixit* are proofs, then we have them in abundance, not otherwise; neither has he satisfactorily shown a "necessity for a thorough reform in the present system of examinations."

In conclusion, it is gratifying to find that all the hearers of this lecture were not of the same mind as the lecturer.

Whether Mr. Siebold is an examined pharmacist or not, I have not the means of ascertaining at present. I hope not, for neither as a pharmaceutical chemist, nor as a teacher of pharmacy, is he by these sentiments advancing the interests of the profession.

T. H. Hustwick.

Liverpool, Feb. 5th, 1872.

Sir,—Having read the letter of Mr. Keen, published by you last week, I feel compelled to ask for a portion of your space to reply to his criticism of the lecture delivered by Mr. Siebold.

Mr. Keen writes, "I am sorry it (the lecture) has been thought worthy to be reported *in extenso*." I, on the contrary, am glad it was so reported, for now, if it abounds with absurdities and inaccuracies, they may be proved as such, and our young men cannot be misguided by anything that Mr. S. may choose to say.

The comparison drawn by Mr. K. between Dr. Attfield and Mr. Siebold is not worth much. I am acquainted with both gentlemen, esteem them highly, and, having received instruction from them, I have great pleasure in acknowledging my obligations to them. I doubt whether Mr. Keen knows anything of Mr. S. further than his lecture. Taking this into consideration, I feel that I am able to crush the intended blow at Manchester candidates and one of their teachers.

Mr. Siebold made his remarks, not because of the failings of his own students, but from the results printed month by month in the Journal. Mr. K. must not forget that there are many candidates that do not come either from London or Manchester. From what I know of Mr. S.'s students, they have been very fairly successful; of course, he has had the misfortune to have a man rejected sometimes, but I will dare to say it was the student's, and not Mr. S.'s, fault. Has not Dr. Attfield had a few unsuccessful candidates? Yes. However hard a teacher may work with some men, they either cannot or will not learn. I think Mr. K. would find our city would have as good an average of successful students as London if he compared the results.

He complains of the method Mr. S. gave, to students in business, for obtaining their knowledge. Mr. S. advocates the study of each subject to be carried on together. Mr. K. says such a system must end in confusion of thought, and failure. That might be the result if the student only read by "snatches," but that Mr. S. did not recommend. I think the subjects are so linked one with another as to make it impossible to master them without being studied together. I do not know a teacher who recommends otherwise. Take, for example, our School of Pharmacy, Bloomsbury Square. You will find that lectures are given there on each subject during the week. Does Mr. K. think it best for a student to enter a course upon chemistry one session, materia medica the next, and so on? I am sure he cannot think that; therefore, if students at Bloomsbury Square study the subjects simultaneously, why should not those who are unable to attend adopt the same course? A great portion of the candidates are unable to attend a session, having to work and study together. If a young man can have, as Mr. S. said, two hours a day of real study, he may do very well.

Mr. K. next refers to botany. I think he might have found a better example than Fol. Buchu as a plea why botany should be one of the subjects of examination. My answer to his question is, that if he will refer to his 'Bentley,' he will not find that Fol. Buchu are said to have "pellucid dots" or indentations. Bentley says they are "dotted," but to learn about the kind of dots, and the indentations of the margin, a work on materia medica must be resorted to. This example, then, does not prove the necessity of botany. My opinion about the use of botany is, that for the "Minor" it is needless, as that examination ought not to exclude any one fit for the duties of a "chemist and druggist;" for the "Major" examination, its structural branches, and the diagnoses of the principal medicinal Natural Orders, ought to be fairly understood.

With regard to practical pharmacy, I differ from Mr. Siebold, but would not say his remarks "are so absurd as to be almost beneath one's notice." Mr. K. would do well to write with a little better feeling, if he wishes his letter to have weight with our body of chemists.

Mr. S. has ground for some things he says on the subject, but I think not for all.

I agree with him about the recognition of extracts being impossible, with an exception or two. He is too strong when he says, "The examiners require the candidates to know by heart the component parts of compound powders, mixtures," etc. I think the examiners on this subject will be well satisfied if the important ingredients are known. For instance, Pulv. Kino Co.: if the candidate remembered that it contained opium in addition to kino, I think the examiner would excuse his failing to remember the cinnamon, knowing that candidates are more or less nervous.

As to the recognition of tinctures, I was only shown those that could be recognized, either by sight or smell, by any one whose right place was in the examination room.

It is a matter of great importance to know the active ingredients of compound preparations, and the proportion of poisonous constituents. If a man does not know this, how is he likely to detect errors in surgeons' prescriptions? It is not likely that a person will remember all the exact B. P. doses of compound preparations, so that it is imperative that this subject should not be trifled with. If an apprentice is trained well, he will not need to "cram" for his examination in practical pharmacy. Mr. Keen very gravely doubts the assertion made by Mr. S., "that able and well-qualified men fail, and that others quite incompetent succeed." He considers it almost impossible with the machinery in force at Bloomsbury Square. He does well to say "almost," for I think I could mention one, if not more, of each kind. His personal experience not being of the smallest, led me to seek some information about it. I find that last month he passed the Major, so I presume he is giving his evidence of what he saw on that occasion. I agree with him that, as a rule, the examiners are courteous and gentlemanly, though I think it has not been his lot to be called in for examination about 3 o'clock, when the examiners are getting tired, and some of them rather short-tempered. I think there is room for a little improvement. The examiners should not, because they have had one or two dull candidates, have their earlier courteous manners ruffled. I have heard a few complaints from both the successful and unsuccessful. The method of examination is the most important topic, and requires great care as to what is said upon it. I have not the slightest ill-feeling against the examiners, so, if I say anything that seems as though I had, I wish it to be understood that my motive in saying it is for the benefit of future candidates. The manner in which the subject is questioned upon has a great deal to do with the success of the candidate. Questions should be given in such a manner as to admit of one answer only. My experience is, that questions are given that admit of more than one answer, the candidate not knowing how to interpret them. He answers according to his judgment; he is not told whether rightly or wrongly, and possibly does not give the answer expected. I think the candidate ought to know whether he gives a right answer, for sometimes he might correct a pure mistake. When questions are given admitting of more than one answer, the examiner ought to be able to tell if he gets any of the possible answers. To be able to do this efficiently requires men who devote their time to the special study of that subject. I would therefore plead for examiners, professors of chemistry, materia medica and botany, and good practical pharmaceutical chemists for pharmacy and dispensing. I cannot see that men having businesses to attend to can act efficiently as examiners in the scientific subjects. This is not entirely my own thought; it was first brought under my notice, when in London, by a gentleman whose authority in such matters is looked upon by our body as worth something. I think it would be a preventive against the success of a crammed man, and be better for the real student.

In conclusion, I earnestly call some of our esteemed and well-qualified gentlemen to give their opinions on this very important subject. My apology for the length of the letter is the great difficulty of condensation.

Joseph Wm. Gill.

Pendleton, January 31st, 1872.

Sir,—Mr. Agnew's letter in last week's Journal is one which cannot be overlooked and passed by without comment by any one who is interested in the subject of pharmaceutical education. I am at a loss, I must confess, to understand his exact meaning, and I would ask him if he is prescribing a course of knowledge necessary for the faithful discharge of the duties of a pharmaceutical chemist, or if he is drawing a synopsis of an examination for the degree of D.C.L.? In the case of the Preliminary examination,—where the analysis he quotes shows so large a percentage of failures upon questions considerably easier "than those passed by a lower third-form boy in any public school every three months,"—he suggests the addition of the subjects of geometry and algebra; and further, that the Preliminary test should include Euclid, algebra and the translation of the 'Iliad;' decimals, extraction of the square and cube roots, together with the laws of arithmetical, geometrical and harmonical progression, and logarithms, a knowledge of French and German and the metric system.

Now, Sir, is this consistent?—because a boy does not know his multiplication table, set him to work out a double rule of three sum! Such seems the tenor of Mr. Agnew's theory for the cure of one of our greatest pharmaceutical grievances,—the many failures in the Preliminary examination,—and he must pardon me if I cannot agree with him. That there is great need of and room for improvement is without doubt, but I scarcely think we shall get it by making the examination more stringent.

As it is now, the questions seem to me very appropriate to the attainment of the desired object. If you make them stiffer, embracing the scientific subjects suggested by Mr. Agnew, your candidates must have received a higher scholastic education to warrant their competing, and I scarcely think men will be found to give their sons a high-class and expensive education without aspiring to a higher calling for them than the drudgery of a chemist's apprentice. There is, of course, no degradation in our calling,—it certainly ranks first as a trade; but a trade, and not a profession, it most certainly is, and boys at good schools nowadays are taught to scorn the idea of shopman and counter-work. There is no trade where an apprentice's work varies so much as in ours; in some establishments he is treated as a pupil, with one or two hours a day allowed him for study, and is taught the science and theory of chemistry; but in how many businesses is his duty chiefly confined to beating up horse physic, opening and shutting up the shop, and, in many country shops, weighing tobacco, etc.! Of course, what is law for one must be for the other. The only remedy for these failures seems to me (and I may be wrong), to make the youth pass the Preliminary examination before his indentures are signed; in this case the failures, though possibly much less, would have less significance, because if he was found incapable of passing the Preliminary examination, he would then have the opportunity of embracing some other calling, which would not accrue if he had (possibly) been one or two years behind a chemist's counter. I must apologize for occupying so much of your valuable space.

Dover, February 5th, 1872. T. J. Perkins.

Trade Marks on Prescriptions.

Sir,—It is a happy sign of the progress of pharmacy and of the improved tone of pharmaceutical ethics, that the practice of marking the price charged against each item in a prescription, is becoming much more common.

It is much to be wished that the practice were general, for it is satisfactory to know that you are charging the same price as a chemist in some distant town, and it is still more satisfactory to be able to refute that rather numerous class of customers, who untruthfully say, "Oh, Mr. — charged me 6*d*. less than that!"

Travellers frequently tell me that they have been charged 2*s*. 6*d*., 2*s*. or 1*s*. 6*d*. in different towns for some well-worn prescription, and wonder that prices should vary so much.

To those who object to use a trade mark, fearing that some mean rival will purposely charge less than the price marked, I would suggest that it is better to be undersold to the extent of 3*d*. on a published price than that the rival should charge 6*d*. or 1*s*. less, through not knowing the real price and being determined to undersell at any price.

Moreover, when a prescription has been made up at a fashionable shop and charged more than the usual price, it is pleasant to the subsequent dispenser to get a higher price than he otherwise would, and the customer is prevented thinking the first dispenser extortionate.

In cases in which it is deemed impracticable to use a trade mark always, it is obviously both a just and wise custom to mark all peculiar and unusual medicines which cannot be priced according to any regular list, and in such cases where no regular mark is used, it is best to use Bell's "you and them," or the Edinburgh "mel boracis."

It not unfrequently happens that a prescription made up in some distant town has been marked by the careful hand of some brother pharmaceutist with a mark which is unfortunately not known to us, and my chief object in writing to you is to suggest that you should publish a list of all the public and well-known marks, such as:—

You and them . . Bell.
Cambridge . . . Savory.
Despumatio . . . Corbyn.
Mel boracis . . . Edinburgh, Manchester and Birmingham.

Together with those which are in pretty general use, such as:—

Cumberland.
Coldstream.
Very thankful.
May God help.
Vinum aloes, *etc.*

No doubt some of your correspondents can add considerably to this list, and the secretaries of associations using a mark, will, doubtless, be glad to publish it for their own good and ours.

Walter J. Churchill.

Birmingham, January 17th, 1872.

Difficulties in Dispensing.

Sir,—The enclosed prescription was brought to be dispensed a few days since. Perhaps some of your correspondents, who appear to have such tender consciences with regard to keeping minutely to the directions of the prescriber, will be kind enough to inform me how such ingredients can be formed into a mass from which pills may be rolled, without in some way or other altering or rather amending the formula.

Perhaps their better judgment and larger experience may suggest a *modus operandi* which may be at once satisfactory to the prescriber, creditable to the dispenser and as beneficial in its results to the patient:—

℞. Opii Pur. gr. $\frac{1}{8}$
Plumb. Acet. gr. $\frac{1}{4}$
Ext. Ergot. Liquid. gtt. iij
Secal. Cornut. q. s.

Ft. pil. mitte no. xl. Sumat pil. ij quart. hor.

℞. Podophylli gr. $\frac{1}{2}$
Ext. Aloes Aq. gr. xij
„ Bellad. gr. j

M. et divide in pil. xlviij, to be silvered. Six or eight pills occasionally.

The above is rather an exceptional size for pills, and the less frequently the dispenser sees them the better.

Bournemouth, January 20th, 1872. Dispenser.

C. Davies.—Chemists and druggists cannot sell the smallest quantity of unmedicated spirits of wine without licence, under a penalty of £50. Recently, prosecutions have taken place and convictions been obtained for selling as little as two ounces of spirits of wine, which, although slightly medicated, was not sufficiently so to unfit it for use as a beverage.

"*Nemo.*"—Oil of tar is a somewhat heterogeneous product, obtained by distilling Stockholm or Archangel tar. It may be rendered colourless, or nearly so, by alternate treatment with caustic alkali and oil of vitriol, and redistilling.

N. O. A.—(1.) So far as the operation of the Act is concerned, it would be safe. (2.) The materials you mention might be held to come under clause 3, as being directly made from a "bituminous substance," viz. wood tar. The licence you have sent is for the keeping of petroleum.

C. J. Bell.—(1.) The case was not considered to come within the exceptions contemplated by the Act. (2.) You had better consult a legal adviser. (3.) Yes. (4.) They have the same privileges as Associates not in business, except that they have no vote or participation in the administration of the Benevolent Fund.

Communications, Letters, etc., have been received from Mr. D. Hanbury, Mr. R. Bannister Mr. Groves, Mr. H. Pocklington, Mr. J. Tully, Mr. J. F. Brown, Mr. Keen, Mr. R. L. Churchyard, Mr. J. H. Wilson, Secretary of the Oldham Association, "A Minor Associate," "Chemicus," "Inquirer," F.C.S., "Quæsivi," "A Medical Dispenser," "An Assistant," "Fairplay," J. R. W., A. M. B., J. C. H. M. P. S. H.

THE MICROSCOPE IN PHARMACY.

BY HENRY POCKLINGTON.

(*Continued from page* 622.)

The use of the microscope in the detection of adulterations would appear to date from a time not more remote than 1850, when Dr. Hassall laid before the Botanic Society of London his historic paper on the adulterations of coffee. Previously to the researches of Dr. Hassall and his *collaborateurs* on the *Lancet* Commission, it was commonly believed that, so far as many articles of common use were concerned, chemistry was utterly powerless to detect adulteration, and that it was vain to expect to be able to place any check upon the dishonesty or the malpractices of the vendors of those articles. So secure did the vendors of adulterated foods, drinks and drugs feel themselves, that the publication of Dr. Hassall's reports was as if a thunderbolt had been thrown into their camp; and to this day his papers exert a not unimportant influence for good. Although the practice of adulteration still exists to a frightful extent, and has become so respectable that a late member of the Government of this country has had the boldness to say that it is a mere species of "competition," and therefore perfectly allowable, yet it is not so prevalent with respect to articles commonly used for food and drink as prior to 1850. Nor, so far as my experience goes, does adulteration take so dire a form now as before the publication of the *Lancet* reports. It is, at any rate, now possible, as I have proved again and again in my own household, by dealing with respectable tradesmen, to procure articles of more than "commercial" purity.

The present movement, in some of our large towns, for the appointment of a "public analyst" is a sign of the times which members of the Pharmaceutical Society will do well to take to mind. For there is little doubt that, with increased educational advantages, the common people will become more awake to the hygienic importance of pure air, pure water, and pure food; and that, before many years are passed, there will be found but few towns, or even large villages, without a duly-qualified public analyst, appointed and paid for by the ratepayers, for which post a member of the Pharmaceutical Society ought to be the most qualified person. With the idea that it may be useful to such a one, I shall include in these papers, not only notes on the detection of adulteration in drugs, but also of foods, so far as the use of the microscope is specially advantageous.

It may be best, perhaps, to make these articles a progressive course of instruction,—to regard first those substances which are most easily examined, and then to proceed, by as easy stages as possible, to those which require a more lengthened or difficult preparation before they can be microscopically examined; and we will wind up, if space permit, with a brief notice on the use of the microscope in the examination of such things as sputa and urine, respecting which the opinion of a skilled microscopist is often required.

We will begin with the starches, arrowroots, and their allies, including "foods" and "flours."

To become familiar with the microscopical appearance of the genuine article is obviously the easiest course to follow, if we merely wish to detect the presence of an adulterant in arrowroot or any other article. But, as in addition to its being of scarcely less importance to be able to pronounce *what* the adulterant is than to detect its presence, the procuring a well-authenticated specimen is a matter of great, and sometimes insuperable difficulty, when we have to deal with articles that are only imported in a "manufactured" condition, it is necessary to familiarize ourselves with the characters of all those substances which are *likely* to be used as adulterants. This will necessitate, in the case of arrowroots, etc., an acquaintance with the nature of starch, its origin, the resemblances and differences between the starches from different plants, and the nature of any inorganic or organic substances likely to be found in company with starch naturally, or to be added as an adulterant.

We are face to face with an analytic axiom,—that those substances only are used as adulterants, as a rule (which has, as may be expected, very few exceptions), that are less costly than the genuine article, and have characters sufficiently in common with it to enable them to pass muster, or will chemically or mechanically enter into combination with it. These substances may be roughly subdivided into, those added to increase bulk or weight, and those added to blind the purchaser to faults of manufacture or inferiority of quality.

Applying this axiom to the examination of arrowroot, we shall be led to test for cheaper starches, and, in the case of the higher-priced arrowroot, the presence of a lower-priced one. As a preliminary we shall familiarize ourselves with the microscopic appearance of such starches as are commonly found in commerce, and are sufficiently cheap to form an inducement to fraudulent men to make use of them for the purpose of adulteration. Foremost amongst these is starch from the potato. Potato-starch is so frequent an admixture with articles used in food, that it is very essential the analyst should make himself thoroughly familiar with it under all the circumstances in which it can be placed. This is the more essential, because the microscopic appearances of a starch granule *in situ*, in water, dry, in oil, resin or spirit, raw and cooked by the aid of moist or dry heat, differ so widely that he who was acquainted with it under one condition only, would fail to recognize it under any of the others. The first thing to do is to procure the starch. It is so easily prepared from that not rare article, the potato, that it is not worth while to run the risk of being perplexed with an adulterated adulterant (a "poisoned poison" is common enough) by examining the potato-starch of commerce. The simplest plan is to examine the granules *in situ*. Slice a potato into halves, and then cut as thin a section as possible with a sharp razor. Float this off on to a thin glass, add a drop of glycerine diluted with 25 per cent. of water, and, having covered it with a glass slip, proceed to examine it with a half-inch or one-inch objective. The starch granules will be seen to lie loosely in the interior of large cells, and to vary greatly in size, from the fully-formed starch granules to the exceedingly minute, almost shapeless granules lying along the centres of active growth. This wide range of form-element is exceedingly perplexing to the analyst of starches, and renders it excessively difficult in some cases to decide absolutely as to the precise nature of some of the starches submitted to him. But, although there is a wide range of size for each starch, yet each species has a tolerably well-defined average, which enables the analyst in many, indeed in most cases, to decide upon the genuineness or not, of the article.

To apply this test requires that the starch granules be isolated, and prepared for observation—a matter of little difficulty, as starch is easily diffusible through water, and remains suspended long after the other constituents of the potato have subsided. Professor Attfield* gives very simple directions ('Chemistry,' pp. 368–9) for the preparation of potato-starch:—"Rasp or grate or scrape a portion of a clean raw potato, letting the pulp fall on to a piece of muslin placed over a small dish or test-glass, and then pour a slow stream of water over the pulp. Minute particles or granules of starch pass through the muslin, and sink to the bottom of the vessel." The plan which I have myself adopted is substantially that followed by those who prepare arrowroot and sago for the market, and is perhaps on this account preferable. Pound the potato, other tuber, grain or starch bearer in a mortar to a pulp; throw the pulp into a vessel of water, and, having stirred it well, allow it to subside; collect the fibrous matter (both that which chances to swim as scum and that which subsides before the starch), and remove it. Allow the starch to subside; pour off the supernatant water; fill up the vessel, and pour the milky water through a piece of muslin, and allow the now nearly pure starch to subside. Wash it once or twice, and then collect. Dry, and put into a corked bottle. The resultant starch is "commercially" pure,† and in a fit state for microscopical examination. But, as most beginners have discovered, it is of little use to examine dried starch *au naturel* by either reflected or transmitted light. It is necessary to immerse it in some fluid, than which nothing is better than equal parts of Price's best glycerine, sp. gr. 1240, and water. The use of a quarter-inch object is desirable.

The analyst should make careful measurement of a number of the granules, and take the mean of the whole. Here we may profitably consider the simplest means by which this may be effected. Dr. L. Beale recommends the use of the camera lucida or neutral-tint reflector and the stage micrometer as affording the most "simple and efficacious manner of measuring objects." The neutral-tint reflector is simply a piece of neutral-tinted glass arranged at an angle of 45° to the eye-piece, and can be procured of any optician at a cost of about 7*s*. 6*d*. The stage micrometer (cost 5*s*.) consists of a piece of glass whereon are ruled lines separated by thousandths of an inch (100 and 1000 per inch are most commonly used). The micrometer is arranged on the stage of the instrument, and the microscope inclined on its axis to the horizontal, the neutral-tint being slipped into its place on the eye-piece. The observer, looking down into the reflector, sees apparently on a piece of white paper placed on the table beneath it the outlines of the micrometer divisions, and can with the greatest exactness trace them with pen and ink or pencil. A set of these tracings should be made from each objective, and either lithographed or struck off by letterpress, that a copy may be affixed to each drawing made from the same objective. Removing the micrometer from the stage, a slide of the starch is substituted, and the outlines of a number of the granules carefully traced by the side of the outlined micrometer divisions. It is clear that the ascertainment of the exact size of each granule is a matter of the greatest facility. Ramsden's and Jackson's micrometers are supplied with "first-class stands" for the same purpose, and possess many advantages, but in point of inexpensiveness and simplicity are not to be compared with the very simple plan propounded by Dr. Beale. If only rough measurements are required, it will suffice to place an ordinary rule, divided to one-tenth of an inch, on the stage beside the object or micrometer, and to compare it or the micrometric divisions with the divisions on the rule by observing the latter with the left eye, whilst the right is engaged at the microscope. This simplest of plans is not, however, sufficiently accurate to be used in microscopic analysis.

Specimens of the starch as prepared should be mounted in syrup, glycerine, and for examination by polarized light in 'dammar.'* The specimen in syrup will be found serviceable in the examination of many samples of honey; that in glycerine will show the modifying action of a dense fluid upon the granule. But for general comparison it is essential that a portion should be taken from the stock-bottle; for no medium, so far as I know, can be relied upon for the preservation of starch in its normal condition as to size and shape. Careful study should be made of the changes induced by moist and dry heat, and preparations of each should be put up in dammar and in glycerine (25 per cent. water), that the student may be prepared to recognize the granule under all the modifications produced by boiling, roasting, and even fine grinding.

We have dealt thus fully with potato-starch, because it is a type of all the starches, and is, in addition, the one most commonly met with as an adulterant, and the adulterant of adulterants.

(*To be continued.*)

* I must call attention to an important error into which Professor Attfield has fallen. The Professor says that wheat-starch, viewed by polarized light, does not show the black cross given by potato-starch. The black cross of wheat-starch is most marked and characteristic. The effects of the two starches upon a selenite differ slightly. Rice-starch also gives a "cross."

† Treatment with alcohol and ether is necessary to render it chemically pure, but would be obviously out of place for our purpose.

* So many microscopists have a difficulty in procuring "microscopical dammar," that it will, perhaps, be of service to say that it may be procured in a very convenient form of Mr. Walter White, M.P.S., Norwich.

CRYSTALLIZED ACONITINE.†

BY M. DUQUESNEL.

(*Concluded from page 625.*)

Toxicology of Aconitine.

The next section of the memoir is devoted to the subject of poisoning by aconitine, which is similar in its physiological effects to aconite. One of the most characteristic of these effects is the pricking or tingling sensation, analogous to that produced by pyrethrum root, which is experienced in the mouth after the disappearance of the bitter taste. The sensation is produced in a few minutes by very small doses, or traces only, of pure aconitine, and sometimes lasts

† De l'Aconitine Cristallisé et des Préparations d'Aconit, Étude Chimique et Pharmacologique. Par H. Duquesnel, Pharmacien de Première Classe. Paris: Baillière et Fils.

several hours, and developes into a painful feeling of swelling that has no real existence. This effect is not so clearly produced by any other known alkaloid. Veratrine, submitted to the same test, somewhat resembles it, but the effect is less persistent and pronounced; it is, moreover, easily distinguished by the violet-red colour it gives with sulphuric acid.

The certain recognition of the presence of aconitine for the purpose of chemico-legal investigations, is very difficult, as many alkaloids comport themselves similarly with the reagents. The small quantity, also, causing death, and the great alteration that it undergoes in the presence of certain bodies, such as ferments, necessitate the avoidance of any cause of alteration or decomposition, as imprudent manipulation may cause it to disappear entirely.

The rapidity of the poisoning and the absence of organic lesions are indications pointing to vegetable poisons, and of great value, especially when the symptoms and kind of death can be ascertained with precision. For the separation of aconitine, and other vegetable alkaloids, from the substances containing them, two methods may be adopted, dialysis and that known as Stas's method. When dialysis is applied to the analysis of a mixture containing a large quantity of crystallizable salts and colloids, very positive results may be obtained. But, unfortunately, in cases of poisoning where the toxic agent has to be sought for among a mass of organic matter, its recognition is much more difficult. But it has one advantage, that it can be adopted without prejudice to the results of the other method, which may be applied to the same matter in the event of dialysis failing to furnish sufficient indications.

When the second method is used, the poison is obtained as a scanty coloured residue, very rarely possessing the physical characters of the alkaloid. After having ascertained its alkalinity, it should be dissolved in a little water, acidulated sufficiently to make a neutral solution. The most useful tests for the presence of aconitine are (1) the double iodide of mercury and potassium, giving a white precipitate with 1-20,000th part of the alkaloid; (2) the periodide of potassium, giving a kermes-brown precipitate; (3) tannin, giving a white precipitate insoluble in the acidulated water; and (4) phosphoric acid, which, properly used, produces a violet colour. A part of the solution should be reserved for physiological experiments on animals.*

In the treatment of recent cases of poisoning by aconitine, M. Duquesnel recommends the use of emetics and the administration of periodide of potassium or of tannic acid. But where the poison has had time to become absorbed, it is necessary to have recourse to diffusible internal stimulants, administered in a large proportion of fluid, and the application of friction to increase warmth and favour perspiration, and so promote elimination of the poison.

Pharmaceutical Preparations of Aconite.

In the introduction to this section, the author states that his investigation had its origin in the fact that the new Codex orders the ordinary preparations to be made from the leaves, and recommends that the much more active preparations from the root should not be supplied, except specially ordered. He considers that it would have been preferable to have suppressed the old untrustworthy preparations of aconite, and by a new pharmacology of this medicament, founded upon scientific principles, to have rehabilitated its reputation as a valuable therapeutic agent.

Having obtained what he believed to be the active principle of the plant, together with the means of verifying its identity and purity, he endeavoured—by an analysis of the different preparations employed in medicine, based upon the quantity of aconitine they contained—to verify or disprove their alleged inertness or comparative activity. The results are given in a table from which it appears that aqueous preparations of the leaves of the aconite, prepared in contact with the air at a temperature of about 100° C., are nearly inert; that the tinctures and alcoholic extracts of the leaves are a little more active; but that it is only in the preparations from the root, such as the alcoholic tincture, that the active principle is found in any considerable quantity: even in these last preparations the quantity in 100 grams varies from 3 decigrams of the alkaloid to 60 milligrams, or sometimes traces only, according to the roots from which they are made. These analytical results were confirmed by physiological experiment.

M. Duquesnel therefore proposes to make the following preparations officinal to the exclusion of all others.

Tincture of Aconite Root.—Prepared by reducing one part of the root to a fine powder by means of a mortar and a covered sieve; macerating it in five parts of 90 per cent. alcohol for eight days, with frequent agitation, and then pressing and filtering it. Five grams of this tincture would represent one gram of the root. This tincture is rather inconvenient for internal use, in consequence of the pricking and tingling sensation it produces.

Alcoholic Extract of Aconite Root.—Prepared by exhausting the root by 90 per cent. alcohol in three successive macerations of three days each, the residue being pressed after each maceration. The liquors so obtained, united and filtered, are distilled slowly in a water-bath, and evaporated to the consistence of a firm extract, being sheltered as much as possible from contact with air, and the temperature not exceeding 60° C. One kilogram of the root will yield from 160 to 180 grams of extract.

This extract, which attracts moisture freely, is of a yellow chestnut colour, and has a feeble, but peculiar smell. It acts energetically, and may be given in doses of from one to two centigrams (corresponding to two- or four-hundredths of a milligram of crystallized aconitine), or even three centigrams in the twenty-four hours. The extract may be made into pills containing one centigram.

Syrup of Aconite Root may be prepared according to the following formula:—

Alcoholic Extract	0·10 gram.
Simple Syrup	200·00 „

Mix cold. One tablespoonful of this syrup (twenty grams) will contain one centigram of the extract.

For external use the author proposes—(1.) The alcoholic extract under the form of an ointment.

(2.) The pure tincture mixed with oil, or, preferably, glycerine.

* Of these several chemical tests, the reaction with phosphoric acid is really the only distinctive one; and this is so uncertain, even in the hands of able experimenters, as M. Duquesnel himself acknowledges, that it would be safer to say that the physiological test is that which alone ought to be relied upon.—Ed. Pharm. Journ.

In summing up, he recommends in order to avoid variability in the effects of preparations of aconite—(1) that the *Aconitum Napellus* should be used; (2) that the leaves should be rejected; (3) that the root of the wild plant, properly selected, should be preferred; (4) that the tincture and alcoholic extract, which may be accommodated to all pharmaceutical forms, should alone be used.

Selection of the Roots.

To this point, one to which he attaches great importance, M. Duquesnel devotes the last section of his memoir, his object being to indicate a root which contains a certain, and nearly constant proportion of the active principle.

The genus *Aconitum* contains various species that are used in medicine, of which the following are the principal:—

1. *A. ferox*, Wall. It grows principally upon the summits of the Himalayas, and furnishes the Indians with their celebrated bikh or bish poison. It is the most active species of the genus, not because it contains a more energetic principle than aconitine, but because it contains a larger proportion. Analysis has obtained crystallized aconitine from this root with its ordinary form and properties.*

2. *A. Anthora.*—Less active than the others.

3. *A. Lycoctonum.*—Very active, but little used.

4. *A. Napellus* is used in France to the exclusion of all others. Climate, culture, age and the mode of collection have great influence upon its properties: a stony soil, the wild state, and a mountainous country are the conditions most favourable to the development of its active principle. The aconite grown in the south is much more active than that grown in the north, where, according to Linnæus, the Norwegians and Lapps eat the young shoots with impunity. All parts of the plant contain aconitine, but the seeds less than the leaves, and the leaves less than the roots. By desiccation the leaves appear to lose a great portion of their properties; the roots preserve them better.

A careful examination of specimens of dried roots of *A. Napellus* shows that they may be divided into three classes:—

1. Root dry, irregular, horny and yellowish at the fracture, resembling much the root of *A. ferox;* a small portion scraped upon the tongue produces the characteristic tingling. It is extremely active, containing, consequently, a large proportion of the active principle; but it is extremely rare.

2. Root having the same appearance as the preceding, but the interior not presenting the same horny structure, except at some points of the peripheric layers, the other parts of which are formed of a more or less greyish-yellow fibrous substance. The centre of the root is occupied by a white amylaceous matter, less abundant as the root is more active; or completely empty, in consequence of the retreat of the central parts caused by the desiccation of the peripheral portion. This root is less active than the preceding, but a small quantity will produce characteristic effects.

3. Root inflated, meriting more than the others the name "napiform," the surface smooth and marked with whitish points, which are the cicatrices of the radicals. The exterior has the same colour as the preceding, but the interior consists of a light, whitish, amylaceous substance, very different from that which constitutes them. Its physiological effects are very small.

Of these three sorts the second should be used. It is very energetic and constant, is common in certain countries,—the Vosges and Switzerland for example,—and in default of the first, which is very rare, contains the largest proportion of aconitine. The third sort, found principally in cultivated roots, should be absolutely rejected. It contains but slight traces of aconitine, as may be proved by analysis or the absence of the characteristic tingling upon masticating a small piece.

* M. Duquesnel does not appear to have seen an article by Mr. Groves on "Nepaul Aconite" (Pharm. Journ. 3rd Ser. Vol. I. p. 433), in which he states that he had extracted from the *Aconitum ferox* the pseudaconitin long since described by Von Schroff, its discoverer, and more recently by Flückiger, but whose existence had been generally disputed. The roots experimented upon by Mr. Groves contained, in one pound, eight grains of pseudaconitin and twenty grains of aconitin. The crystallized pseudaconitin was exhibited by him before the Pharmaceutical Conference at Liverpool.—Ed. Pharm. Journ.

THE LOSS OF THE HERBACEOUS PARTS OF PLANTS IN DRYING.

BY JOHN M. MAISCH.

Few pharmacists have a correct idea about the amount of moisture contained in the drugs which they are daily handling, and many would smile incredulously if informed that some of these drugs, which are regarded as "dry," still lose from one-seventh to one-sixth of their weight if dried in a water-bath, and that even many of the powders as met with in the shops contain from six to ten per cent., and sometimes more moisture. Carefully performed experiments with a large number of drugs and dry preparations are very much needed; for it is obvious that galenical preparations, and particularly tinctures, syrups, fluid extracts and the like, must vary in strength as prepared from anhydrous or merely air-dry material, though both may be of equal quality when anhydrous.

The loss in weight of living plants or parts of plants, when brought to an air-dry condition, is likewise a subject about which little is known, since pharmacists usually depend on wholesale dealers for their supply of indigenous drugs, though the plants may grow abundantly within convenient reach. The superior quality, however, of drugs collected and cured by the pharmacist, as compared with their usual condition in the general market, is often so striking, that few who value good and reliable drugs would be willing to discontinue such collection and curing, after they have once commenced it.

In collecting the annual supply, it is necessary to take into consideration the loss of these medicinal herbs, sustained by drying. The following table is compiled from observations by me, with plants or their parts of my own collection, and I regret that other notes of the more important medicinal herbs, growing in this locality, are now not at hand. Sufficient care was invariably taken to collect and weigh the plants free from external moisture by dew or rain; the drying was effected under an airy shed or in a room, protected from rain; and the final weight was taken when the plants ceased to lose weight in an ordinarily dry atmosphere:—

	Loss per cent.	Yield, air-dry, per cent.
Chimaphila umbellata, leaves and stem	48·98	51·02
Mentha canadensis, the flowering herb	89·21	10·79
Scutellaria lateriflora, ,,	77·68	22·32
Lobelia inflata, ,,	76·56	23·44
Prunella vulgaris, ,,	76·39	23·61
Nepeta Cataria, ,,	76·39	23·61
Eupatorium perfoliatum, the flowering tops	76·52	23·48
Gnaphalium polycephalum, the flowering tops	63·34	36·66
Hypericum perforatum, the flowering tops	61·03	38·97
Datura Stramonium, the leaves	88·70	11·30
Hepatica triloba, ,,	71·65	28·35
Cassia marilandica ,,	70·92	29·08
Leontodon Taraxacum, the root collected in October	72·40	27·60

The above data are too few in number to allow of any general deductions; it seems, however, as if low plants from wet localities (*Mentha canad.*) and juicy leaves (*Stramonium*) may yield air-dry residues, equal to about one-ninth, plants from dry sandy soil (*Gnaphalium* and *Hypericum*) about one-third, other plants about one-fourth or one-fifth of their original weight; the large yield of *Chimaphila* is doubtless in the main due to the woody stems, and in part also to the leathery leaves.—*Amer. Journ. Pharm.*

NOTE ON PERCOLATION.

BY LOUIS S. COHEN.

The most efficient instrument for all preparations which require to be made by percolation, is, in my opinion, the ordinary glass-funnel of an angle of about 59°, as the following results of an experiment will clearly show:—

Having mounted a Bohemian glass-funnel and a cylindrical glass percolator, each with a sufficient amount of material to obtain four pints of tinct. gentianæ co., my results were as follows:—

	From the glass funnel.	From cylindrical glass percolator.
The *first pint* of diluted alcohol coming through, increased in weight	℥j, ʒiij, gr. iv	℥j, ℈j
The second pint	℥j, ℈j	ʒvj, gr. xxiij
The third pint	ʒv, gr. xiij	℥iij
The fourth pint	ʒij, ℈j	ʒj, gr. iv.

In various other experiments I have always been able to obtain far better results, and to exhaust the material more thoroughly by employing the glass-funnel.—*Amer. Journ. Pharm.*

CONDURANGO.

Although the cancer-curing properties of this drug are still matter for dispute, the botanical affinities of the plant yielding it are now pretty well determined. Dr. Buyon, a French botanist resident in Ecuador, had stated that the plant from which the drug is derived is the *Mikania guacho* of Endlicher, belonging to the tribe *Eupatoriaceæ* of the Order *Compositæ;* and, as this is an abundant species throughout South America, there would be, in that case, no reason for seeking it especially in Ecuador, nor for the high price which the drug commands. The description of the plant already given in our pages (PHARMACEUTICAL JOURNAL, No. 73, p. 405) is, however, entirely irreconcilable with its belonging to that Order, and completely supports the reference there assigned to it to *Asclepiadaceæ.* We have now a full description of the plant from Dr. A. Destruge, of Guayaquil, a corresponding member of the Société d'Anthropologie of Paris, as follows:—Calyx of 5 ovate obtuse divisions, villous below, of quincuncial æstivation. Corolla rotate, of 5 lanceolate divisions, hairy at the base on the inside, somewhat fleshy, with a membranous margin, of imbricate æstivation. Stamens without appendage; anthers terminated by a membrane, pollen-masses elongated, suspended. Stigma pentagonal, conical. Flowers numerous, arranged in umbels. This description determines, without hesitation, the plant to belong to the Order *Asclepiadaceæ,* and Dr. Destruge refers it to the suborder *Asclepiadeæ veræ,* division *Astephanus,* characterized by having the limb of the corolla without scales, and the stamens without appendage or corona, and comprising only five genera, *Mitostigma, Astephanus, Hæmax, Hemipogon* and *Nautonia.* The condurango possesses, however, characters which prevent its being assigned to any of these genera: it is destitute of the long filaments at the end of the stigma characteristic of *Mitostigma;* in *Astephanus* the calyx-segments are acute, the corolla subcampanulate, and the stigma elongated; in *Hæmax,* the segments of the corolla are hooded; in *Hemipogon* the calyx-segments are acute, hard, and with curved apex; and in *Nautonia* the calyx-segments are striated and concave. It must, therefore, be erected into a new genus. Dr. Destruge is sceptical as to the efficacy of the drug in curing cancer; but believes it to be useful in rheumatism and secondary syphilitic disorders. The name condurango, or cundurango, is said to signify, in the Quicha language, "vine of the condor," from the tradition of the country that, when the condor is bitten by a poisonous serpent, it swallows the leaves of this plant, and experiences no harm.

NATIVE POISONS OF INDIA.*

BY P. A. SIMPSON, M.D.,

Professor of Medical Jurisprudence, Anderson's University.

(*Concluded from page* 627.)

Opium.—I am not going to say anything as to the sources from which *opium* is obtained, or the modes in which it is prepared. The few remarks which I propose to make regarding it will refer only to the manner in which this drug is used in India. The vice of opium eating is a very ancient practice in India,—so ancient, that the date of its introduction into that country cannot be traced. The act of "eating opium together" was the form by which rival clans became reconciled and personal friendships were declared. To "eat opium together" is the most inviolable pledge, and an agreement ratified by this ceremony is stronger than any oath. On a birthday, when all the chiefs convene to congratulate their brother on another anniversary, the large cup is brought forth, a lump of opium is placed in it, upon which water is poured, and by the aid of a stick a solution is made to which each helps his neighbour, not with a glass, but with the hollow of his hand held to his

* Read before the Glasgow Chemists' Association, Jan. 10, 1872.

mouth. In earlier times they merely bruised the capsules and steeped them for a certain time in water, drinking the infusion, which was called "tejarro," or sometimes "poss" (the poppy). Some idea of the present prevalence of opium-eating in India may be gathered from the fact that the mere licence fees for one year amounted to the enormous sum of £493,943. The lucrative nature of this trade may be conceived when I tell you that last year it was discovered that several of the opium dealers in Calcutta had no less than seventeen shops a-piece, solely for the sale of this drug.

Prevalent as the vice of opium eating (with all its dire consequences) is in India—vast numbers of infatuated wretches having accustomed themselves to consume large quantities, varying from 9 to 180 grains of pure opium daily,—we have no grounds for believing that this drug is frequently used in those districts in which opium is *not* grown, either as a means of suicide or of murder. But in opium-growing districts this drug is very frequently used with intention to cause death. You are aware that amongst several tribes in India there obtains a systematic practice of destroying the lives of *all* the female infants, and opium is very frequently the means employed; either in the form of a small pill which the child is made to swallow, or, as is more recently the custom, by rubbing the nipples of the mother with opium. In this latter way it is insensibly imbibed with the milk by the infant, and thus life is extinguished. Unlike datura, opium is not much used in India for facilitating the commission of theft. The action of the drug is less rapid and certain than that of the datura; its taste and smell are well known to all the natives, and can hardly be disguised; and besides, persons accustomed to the practice of opium-eating would not be easily deceived.

Strychnia.—Strychnia is so very seldom made use of as a poison in India, that a very few words on this subject will suffice. One of the forms in which it is found is in a species of loranthus (*Viscum monicum*), a parasite which grows on the nux-vomica trees, and which has been found to possess poisonous properties similar to those of the tree on which it grows. It is called kuchila in Hindustan, and the natives there often take the kuchila-nut morning and evening, continuously for many months, beginning with gr. $\frac{1}{8}$, and increasing the dose to an entire nut, weighing about 20 grains. If taken immediately before or after meals, no unpleasant effect is produced, but if this precaution is neglected, spasms are apt to ensue. This kuchila—as well as its ally, nux vomica—or strychnia, is used as a stimulant, sometimes with a view of supplanting the habit of opium-eating. It is common, too, amongst the Hindoos and Mahomedans to use nux vomica as an aphrodisiac. A seed of nux vomica is placed for two or three days in the earth under a pot of water. The bark thus becomes easily separable; then with a pair of scissors the seed is cut into very fine chips, not thicker than the nail; one of these is taken with the food once or twice daily. Strychnia is seldom if ever employed in medicine by the Hindoos, owing to its dangerous properties, but it is sometimes used for a very pernicious purpose by the distillers, who add a quantity of it in the process of distilling *arrack* to render the spirit more intoxicating.

Nux vomica is very commonly found in the bazaars or markets of India, but it would appear to be by no means frequently employed in that country as a means of destroying life. It is extremely interesting to note that the experience of practitioners in India entirely coincides with the most modern views of the profession in this country, as to the antidotal power of tobacco in strychnia poisoning. The physiological experiments of the Rev. Professor Haughton are very conclusive that strychnia and nicotine are reciprocally antagonistic, and these are confirmed by clinical experience in this country. In a case of strychnia poisoning, nicotine in doses of a minim should be given in warm sherry or brandy and water—to be repeated if necessary; and should nicotine not be at hand (as is very likely), half an ounce of any kind of tobacco should be boiled for a few seconds in half a pint of water. The fluid is then to be strained, and its temperature sufficiently reduced for drinking purposes by cold water, and a fourth part of this should be at once administered. Should the spasms continue, the dose may be repeated, but should complete muscular relaxation ensue, we should be content.

Lal Chitra.—This poison is derived from the plant *Plumbago rosea*, belonging to the *Plumbaginaceæ*, or "Leadwort Order." This is a very common plant throughout India. The vesicant properties of the root were noticed by Burman, and other old writers, but Sir William O'Shaughnessy was the first to institute a series of trials with it. As the result of clinical observation in between 300 and 400 cases, he states that he found the root-bark rubbed into a paste with water and a little flour, and applied to the skin, occasioned pain in about five minutes, which increased in severity till, in a quarter of an hour, it was equal to that of an ordinary blister. The paste was removed in half an hour, and within twelve or eighteen hours afterwards a large uniform blister, filled with serum, followed. The blistered surfaces were found to heal readily without troublesome ulceration. On the whole it appears to be a cheap substitute for cantharides, possessing the additional advantage of not causing irritation of the genito-urinary organs. Taken internally it is an acrid stimulant, and in large doses acts as a narcotico-acrid poison, in which character it is not unfrequently employed by the people of Bengal. Its action is apparently directed chiefly to the uterine system, and hence it is one of the articles in use amongst the natives for procuring abortion. For this purpose the scraped bark-root is introduced *per vaginam* into the os uteri. Death not unfrequently results from the introduction of this highly acrid agent, inflammation of the uterus and peritoneum rapidly following its use.

Dose.—The dose of the fresh root, when beaten up into a paste (when used as an abortive agent), is from 1 to 2 drachms. An embrocation, formed by macerating the root in any bland oil, is used externally in rheumatic and paralytic cases. Some tribes use the root topically for the cure of toothache, and in these cases it appears to act as a sialogogue. In southern India, the dried root (which is comparatively inert) is in high repute as a remedy in secondary syphilis and leprosy. This plant, which is cultivated extensively in gardens throughout India, owes its activity to a peculiar crystalline principle, called "plumbagin." This "plumbagin" occurs in brilliant yellow crystals, of sweetish but acrid and hot taste, easily fusible, partially volatile, scantily soluble in cold and feebly in boiling water, very soluble in alcohol and ether, in the concentrated acids, and in alkaline solutions. With subacetate of lead a crimson-red coloured precipitate is formed, which constitutes a very valuable and delicate test, available in medico-legal inquiries.

Nerium Odorum.—The *Nerium Odorum* (Kunnar), or sweet-scented oleander, belongs to the Natural Order *Apocynaceæ* (or dog-bane Order), an Order closely allied to the *Loganiaceæ*, or strychnia Order. This sweet-scented oleander is much cultivated in India for the sake of its flowers, which are used in certain religious ceremonies by the Hindoos. All parts of the plant, especially the root, are recognized by the natives as poisonous; and as such are used for criminal and suicidal purposes. It is reputed in Bengal as the best antidote for snake-bite, and it is also frequently employed for the purposes of criminal abortion. It is a curious fact that the root of the hill plant is much more violently poisonous than that of the garden kind, and that jealous women frequently have recourse to it; indeed, it is proverbial amongst the females of the hills, when quarrelling, to bid each other to "go and eat the root of the oleander." It is, moreover, frequently resorted to for the purpose of self-destruction by the Hindoo women, when tormented by jealousy. It is, perhaps, more extensively used as a poison in Bombay than in either of the other Presidencies; the expressed juice from the red variety being considered the strongest and most fatal. The most common medium for administering it is coffee, probably in order to conceal its bitter taste.

As you are well aware, the lower animals seldom graze on plants which are hurtful to them, but the oleander forms an exception to this rule in the case of the camel, which readily partakes of it, and almost always with a fatal result. Perhaps the most interesting observation in connection with oleander poisoning is the occurrence of *tetanic spasms*, very similar to those noticed in poisoning by strychnia. (Bear in mind that the two Natural Orders are very nearly allied.) There is, however, a marked difference between the morbid effects of oleander and those of strychnia, viz. in the condition of the *pulse*. In strychnia poisoning the pulse is usually unaffected (becoming slightly quickened only during each fit), whereas in oleander poisoning a preternatural *slowness of the pulse* is a well-marked feature. Besides its action on the nervous system, therefore, the poisonous principle of oleander seems to have a special depressing influence on the heart.

Gentlemen, I very much fear that the length of this paper has already called forth in you that state of lethargy and exhaustion which we have seen to result from overdoses of datura and gungah. Under these circumstances you must allow me to administer an antidote, and which I propose to do by bringing these very imperfect remarks of mine to a close. I had hoped to have been able to overtake, if only a very brief, reference to each of the four divisions of Indian poisons which I have placed on the board, but want of time compels me to leave the fourth class unnoticed. I have already taxed your patience far too much; and I have only, in conclusion, to thank you very sincerely for the kindness and attention with which you have favoured me this evening.

SENEKA.

BY R. ROTHER.

Polygalic acid, the active agent of seneka root, is invariably accompanied by another peculiar body, termed virgineic acid. When seneka root is treated with water, the polygalic acid alone dissolves. But when alcohol is employed as the solvent, both the polygalic and virgineic acids are extracted. If the aqueous infusion is now condensed, and the syrupy residue treated with alcohol, the polygalic acid is precipitated. Pure polygalic acid is, therefore, insoluble in alcohol. If now the alcoholic tincture of seneka is concentrated to a syrupy liquid by evaporating the alcohol and then water be added, the virgineic acid precipitates whilst the polygalic acid remains in solution.

Virgineic acid, either alone or associated with polygalic acid, is therefore insoluble in water. Now since polygalic acid is readily dissolved by alcohol only in the presence of virgineic acid, it becomes evident that the latter determines the solubility in that menstruum.

Pectin and albumin are two inert constituents of seneka root, which, by reason of their proneness to decompose, must always be avoided in its preparations. Both are soluble in water and weak alcohol.

Consequently, if officinal alcohol is used as the menstruum for exhausting the activity of seneka root, these injurious bodies will be totally excluded from the preparation.

It would now seem that with the use of officinal alcohol all difficulty had been overcome; but the residuary mixture of polygalic and virgineic acid after the expulsion of the alcohol forms, by the addition of water, an opaque intensely milky mixture, owing to the finely divided state of the insoluble virgineic acid. Although virgineic acid is insoluble in cold water, it nevertheless dissolves quite freely in this when hot, yet again separates on cooling in more compact creamy flakes, whilst the intervening liquid seems transparent and clear. The milky liquid at first obtained passes readily through a filter, but unaltered in appearance. However, the same liquid after being heated and again cooled utterly defies filtration, as the impervious precipitate rapidly fills the pores of the paper.

Since the active ingredients of seneka possess acid characters, they will naturally combine with some bases, for instance, the alkalies. This is unquestionably true in case of virgineic acid, as it is instantly dissolved by ammonia, potassium or sodium hydrate, or their normal carbonates, and is immediately reprecipitated by the addition of an acid.

Acting upon the circumstance that the annoying presence of virgineic acid can be tolerated by the intervention of a base, the writer, about two years ago, devised a process for syrup of seneka and compound syrup of squill, which rested upon the application of officinal alcohol and ammonia.

Disodic carbonate would have formed a more stable combination, but it was rendered wholly objectionable by the fact, that many acidulous preparations, as syrup of squill for example, so frequently used in conjunction with these syrups, was rendered entirely incompatible by the antagonism of the acid in one and carbonated alkali in the other.

Ammonia was therefore adopted, but a similar objection in regard to acid preparations ruled here since the virgineic acid was invariably liberated. Even after the beautiful and clear syrup had been prepared a few days, the affinity between the ammonia and virgineic acid relaxed, and the latter again floated free. Upon this the writer resorted to the use of magnesium carbonate to clarify the milky mixture of polygalic and virgineic acid, a precedent already given in other syrups. This was attended with good success, and the process was published.

In the process given the writer adhered to the excellent menstruum, the officinal alcohol which so readily exhausts the activity and so thoroughly excludes the inert fermentable matters, but merely replaced the caustic alkali by magnesium carbonate which, by mechanical absorption, *removed* the virgineic acid. To economize menstruum the writer recommended repercolation; but a single percolation with more menstruum was optional. Subsequently, this process, however excellent, was abandoned for a simpler and more expeditious one.

Syrups are aqueous preparations containing sugar as a preservative of certain substances in the administration of which alcohol is sought to be avoided. Yet, nevertheless, in the majority of these preparations the absence of alcohol in a therapeutic view is not absolutely required. But its presence in a pharmaceutic one is often indispensable to the permanence of such preparation where sugar alone fails to preserve. It is, therefore, the opinion of the writer, that in syrups where the sugar alone suffices alcohol should not enter, but wherever it is required no scruples should be entertained against its presence.

In the new modification a great difficulty is obviated by using the root in coarse powder. The objection to this procedure is again compensated by a short maceration before the root is packed and percolated. A very weak alcoholic menstruum is used, about one-sixth to one quarter alcohol; the percolate is slowly heated to boiling, the albumen precipitated and a considerable proportion of the alcohol is expelled; enough, however, remains for the purpose intended: after cooling the liquid is filtered; this proceeds rapidly, the filtrate being perfectly clear and transparent. The sugar is now dissolved in this by heat and the syrup strained through muslin while hot. Less sugar than usual is taken and still the syrup is thick, permanent, clear and transparent, and possesses the peculiar sparkling brightness imparted to syrup by alcohol in a high degree.

Syrup of seneka is prepared as follows:—

Take of seneka root in No. 24 powder 8 troy ounces.
Sugar 32 troy ounces.
Alcohol,
Water, of each sufficient.

Mix 1 part of alcohol with 3 of water, pour 8 fluid ounces of this on the seneka, macerate twenty-four hours, and pack moderately firm in a cylindrical percolator forming a column of medium height; then pour on the menstruum until 2 pints of percolate has passed, heat this slowly to boiling, maintain the temperature ten or fifteen minutes, evaporate to 22 fluid ounces, let cool, and filter, then add the sugar, apply heat until this has dissolved and strain through muslin while hot. The product measures 2½ pints.—*Chicago Pharmacist.*

NITRO-ETHAL, NITRO-GLYCOL AND A GENERAL METHOD OF TRANSFORMING ALCOHOLS INTO THEIR CORRESPONDING NITRIC ETHERS.

BY P. CHAMPION.*

Powdered ethal is added little by little to a mixture of sulphuric and nitric acids; no appreciable amount of heat is evolved, but after agitation the ethal becomes transformed into a milky substance, which is decanted and freed from admixed acids by solution in ether, and agitation of the ethereal liquid with water; finally the ether is evaporated, and ultimately leaves *nitro-ethal* as an oily liquid which is practically colourless if pure ethal has been used. Thus obtained, nitro-ethal is soluble in ether, carbon disulphide and chloroform; ethylic and methylic alcohols dissolve it but sparingly; on a strongly-heated plate it becomes spheroidal, and burns with a smoky flame; by heating alone it is decomposed, leaving a coaly residue; it solidifies between 10° and 12°, and has the specific gravity 0·91; strong sulphuric acid decomposes it; by analysis it was found to have the formula $C_{16}H_{33}(NO_2)O$.

Nitro-glycol is similarly obtainable by using a mixture of 100 parts fuming nitric acid, 200 of concentrated sulphuric acid, and 42 of glycol, and observing the directions formerly described in the preparation of nitro-glycerine. Nitro-glycerine (*sic* (?) nitro-glycol) is a colourless mobile liquid of a sweet taste, and poisonous; its specific gravity is 1·48; though but little volatile at common temperatures, it is markedly so at 100°; it is soluble in ether and alcohol, but insoluble in water: kept at −15° for two hours it did not crystallize; percussion detonates it, but it does not explode when heated on a plate; thus heated, it volatilizes at 185° and more abundantly at 230°, giving off yellow vapours; at 295° it becomes spheroidal. Its vapour, according to Dr. G. Birgeron, produces, when inhaled, sleepiness and intense and continuous pains in the head; ½ c.c., injected under the skin of a rat, produced in about an hour somnolence and vertigo; the animal then fell into a comatose state, and finally died; six or eight drops under a belljar produced the same symptoms in a bird.

The author considers that the action of mixed sulphuric and nitric acids on alcohols is a general method for procuring nitric ethers, a low temperature being occasionally indispensable; thus ethyl nitrate and amyl nitrate require the materials to be cooled to −15°; by this means octyl nitrate has been obtained identical (?) with that which Bouis obtained by the action of octyl iodide on silver nitrate. In the same way many new chloro- and bromo-nitrated compounds may be formed.—*Journal of the Chemical Society.*

* Comptes Rendus, lxxiii. 571.

VOLUMETRIC ANALYSIS.*

BY W. GILMOUR.

The purity and strength of those substances which the pharmaceutical chemist daily comes in contact with, handles and dispenses, must always form one of his first considerations. This is the more to be remembered, as I am afraid we are apt, nowadays, to overlook it in delegating to the wholesale dealer or manufacturer the preparation of many substances which it formerly was considered the proper province of the retail chemist himself to look after and prepare.

Doubtless, the arrangement is not only convenient, but, in most cases, also most economical,—if economy be a legitimate consideration in a matter so important as medicine in its relation to health; most economical also, we say, thus to look to the wholesale dealer and manufacturer for our supply of those chemicals and substances requiring time and care in their preparation. Indeed, there may have been many reasons apart from the above which we need not take time to indicate, helping to bring about this change in the life and labours of the chemist; but from whatever cause the change may proceed, it has now come to be so thoroughly recognized, that even in the first edition (1864) of the Pharmacopœia the question was taken into consideration "whether this transference of the manufacture of most of the chemicals from the pharmaceutic chemist to the wholesale manufacturer should not form one reason for the withdrawing of the greater part of the chemical processes from the Pharmacopœia altogether;" and there are not wanting other indications that this revolution will not only be permanent, but will, in the future, be even more universal and more strictly defined than in times past. This arrangement, however, if it relieves us of one, imposes on us other obligations, probably not less onerous and difficult, certainly not less important and scientific than the one from which we have escaped; and amongst these we consider will primarily be ranked the testing and proving every substance introduced from extraneous sources into the stock of the pharmaceutist for himself.

So far as this revolution has already taken place we are afraid, not to mince matters, it has been a custom far too prevalent amongst us to receive such chemicals and compounds on the mere warranty of the manufacturer, or, what is far less excusable still, on the assumption of the respectability of the firm from whom they are obtained; oftentimes even without this warranty. Neither the one nor the other, I hold, ought to be sufficient for us, or excuse us the moral obligation of examining all such substances so obtained, each one for himself. He would be accounted a fool, and incapable of being trusted in any important transaction, who would receive a sum of money from a bank, for example, without checking it, on the assumption that it must be correct from the respectability of the bank. No one, we believe, at the same time would think the bank would willingly defraud, but there are a hundred different ways in which an error might creep in; and even were there not, it still would be no less his duty to examine and check for himself. And so is it also with the far more important matter of medicine received into our stock, and from which time we are accountable for it. It is as much a duty devolving on us as the examining of the twenty shillings, "all told and true," which we receive in exchange for a sovereign. Nay, it is an infinitely higher duty, for in the latter case we *may* only wrong ourselves, whilst in the former we may not only wrong ourselves but the public also, and wrong them, too, in what is of far greater value than money, of what is even beyond price,—of health itself.

Commercial men and agriculturists in this respect

* Read at the Meeting of the North British Branch of the Pharmaceutical Society, January 1st, 1872.

have shown us a good example, and for that part of it might almost put us to shame, considering the less important nature of the agents they employ, in so far as they will receive nothing without a written guarantee, and not only so, but combine also, in the face of this guarantee, to employ a practical chemist for protection against impurities and adulterations. What the practical chemist thus does for the foregoing, the pharmaceutist ought to have the education, as he has the means and agents, within his reach to search out and accomplish for himself. We are here forced, Mr. Chairman,—we must confess much against our inclination,—to touch upon that great question of the day amongst us as amongst other public bodies, the question of education; but in doing so, let us speak the honest truth, however unpleasant it may be to hearken to or unpalatable to utter. The individual who is incapable or unwilling to discharge, in any case or every case, this duty to himself and to the public, who is incapable or unwilling to examine scientifically every substance admitted into his possession, and, moreover, too, make this examination the *sine quâ non* of his profession, is unfit for the position he occupies, and ought not to be a member, or in any way an adherent, of our Society. This may be considered strong language to use, Mr. Chairman, but it is not stronger, we presume, than we are warranted in using under the circumstances, and certainly not stronger than we would be able to justify or willing to defend, had this been a general disquisition on pharmaceutical ethics, instead of only a few rambling remarks and facts on its border line.

In thus assigning, and with every day new evidence that we are correct in thus assigning, to the pharmaceutical chemist of the future what we believe will be his position, what will form one of his principal duties, and the importance which will be attached thereto, nothing could have happened more opportunely than the officinal introduction, even whilst opinions were changing and forming in the direction we have indicated, of a system of tests at once comprehensive, simple, and withal accurate. We have no wish now its days are over to say one word against our old friend and companion, and most excellent instructor, the 'Dispensatory,' but we must confess that now in the light of recent advances and changes, and with more especial reference to this one system of tests introduced into the British Pharmacopœia for the first time, the present generation are favoured—we will not say beyond their deserts—but beyond measure. An analysis may now be made in as many minutes as it formerly took hours; and we all know that an analysis which took hours to accomplish, was as much out of the reach of the busy hard-worked chemist as one too delicate or scientific, and otherways beyond his ability. These last we presume were the grand, as possibly they were the unavoidable, errors and objections to *most* of the tests for purity, and more especially strength of chemicals in our older Pharmacopœias; and whilst they are the objections that will ever be probably brought forward by a certain class—the indifferent, the unwilling, and the ignorant for example—under any system, the excuse was then, we must confess, more valid than ever henceforth it can possibly be. There are between fifty and sixty different chemicals and compounds which our present Pharmacopœia brings under the jurisdiction of this system, and this number can be considerably multiplied by consulting any text-book on the subject. But the importance of the system is even more fully demonstrated, if we consider that most of the foregoing fifty or sixty substances enter into other compounds, and determine more or less the relative strengths of those other compounds into which they thus enter.

I had no intention whatever, Mr. Chairman, of entering into any exposition of the system when I first agreed to appear before you to-night with a paper, but I have been urged so strongly by Mr. Mackay and others to do so, and to accompany it also with one or two experiments demonstrating it, that I have consented, I must confess somewhat reluctantly. In consenting, I have had in view more particularly the benefit of a certain portion of the younger part of my audience, viz. those who may never have had the opportunity of getting acquainted with this system practically, or even probably theoretically. It must altogether be an important subject to them, seeing that now they must not only have a theoretical, but also a practical knowledge of it, before coming up for their Major examination.

Here the author explained—1. *The Conditions.*

(1.) It must not occupy much time.

(2.) The conclusion of the reaction must be easily noted from some visible index (?).

2. *The Analysis.*

(1.) Analysis by saturation. (Acids and bases, etc.)

(2.) Analysis by oxidation and reduction. (Mentioning some of the agents.)

(3.) Analysis by precipitation.

3. *Standard Solutions.*

(1.) Those immediately prepared by weighing a substance of known composition and purity—dissolving and diluting it to the required volume.

(2.) Such as are prepared by approximate mixture and subsequent analysis.

4. *Examples of each kind of Analysis.*

Acetic acid, phosphate of iron, hydrocyanic acid, or acetate of lead.

Now after all we have said and shown, in case any one may be inclined to exclaim, "Cui bono?"—of what good is any system of testing at all?—let me put a few results before the meeting, which came under my own observation during a short period of my last summer's holidays, and since. Before doing so, however, let me premise that my observations were necessarily somewhat limited, principally for two reasons: first, that I had not an unlimited amount of time to spare; and second, that samples on which to experiment were not always at my command; and I have indeed had almost entirely to confine myself to those which have come under my own observation in the way of business.

Sulphurous Acid.—One of the earliest substances I experimented on under this system was sulphurous acid, which I was in the habit of manufacturing at one time, more, I must confess, by way of pastime than from any idea of profit connected with it. On examining it after the process was finished, I was exceedingly astonished from time to time, not only at the varying results obtained, but more especially at the unsatisfactory nature generally of those results. I could get the solution to answer every test beautifully but the test of strength, and in this, I must say, there was the wildest divergence possible. Thinking this might be the consequence of making it in small quantities, I from time to time, as I required it, after coming to this conclusion, tried larger makers, but generally with results not much more satisfactory. The standard strength is 9·2 per cent., but from 5 to 7 per cent. I always found more frequently to be nearer the mark, and if kept some time in stock, even less than this. I am sorry I kept at this time no note of the different results obtained in the different samples I thus tried, and I am therefore unable to put a table before you, but probably some of you who have tried similar experiments, may be able to corroborate this experience. I make no remarks here on the difficulty of obtaining in the first place a solution of Pharmacopœia strength, and in the second place of keeping it after it is obtained, but the results were none the less unsatisfactory in the face of a standard strength, and granting also that the varying strengths could lead to no extreme results in practice.

(*To be continued.*)

SUPPLEMENT TO THE FOURTEENTH REPORT OF THE COMMISSIONERS OF INLAND REVENUE.

The Supplement to the Fourteenth Report of the Commissioners of Inland Revenue, just issued, mainly consists of a number of interesting tables relating to the excise; and the report of Mr. George Phillips, the principal of their laboratory, for the financial year ending March 31st, 1871.

In the first table in the book is given the net receipt for the financial year 1870, from excise, stamps, and taxes, as being £40,786,913, and that there had been received from malt and spirit duties £952,549 more than in the previous year. This increase indicates that trade was in a flourishing state, as national prosperity always tends to increase the consumption of the luxuries of life. If there be no disturbing cause, the increase or decrease in the consumption of beer, spirits and tobacco is usually a safe guide in determining the prosperity of the country. The percentages of increase in the quantities of spirits and malt retained for home consumption were respectively 4·46 and 4·40, and this increase in the consumption extended to Ireland as well as to Great Britain. Of spirits charged with duty, the percentage of increase in Ireland, as compared with England, was as 6·80 to 2·96,—a difference sufficiently great to prove that Ireland was exceedingly prosperous during the year 1870.

The quantity of spirit methylated in the United Kingdom was 24,829 gallons in excess of the previous year. In Ireland the number of detections of illicit distillation was 402 less than in 1869; the "potheen" manufacturers must, therefore, have either acted with greater caution than usual, or have suspended operations for a time, in order to follow more legitimate occupations.

It is very satisfactory to find that the quantity of sugar made in the United Kingdom was 5714 cwt. against 2972 cwt. in 1869. In Germany and France the manufacture of sugar from beet is a large branch of national industry, and annually becomes more flourishing and important. There appears to be no valid reason why this manufacture, now successfully carried on by Mr. Duncan, at Lavenham, in Suffolk, should not become general, and thus open up another branch of trade to the British agriculturist. From statements which have been made in the *Times* by such men as Mr. Caird and Mr. Duncan, who thoroughly understand the subject, it appears that the Lavenham works have been profitable, in spite of the many drawbacks always surrounding a new manufacture; and there is no reason why other sugar refiners should be deterred from embarking in the trade.

The quantity of sugar used in brewing has decreased 1,186,640 lb.; the amount, however, consumed during the past year reached 31,950,240 lb., or upwards of 14,263 tons. Of glucose sugar, made in this country from starch, duty has been charged on 24,007 cwt. This sugar is used exclusively for brewing purposes, and is said to have the property of preserving the beer brewed wholly or partially from it.

After the tables of excise duties follow a great number relating to licences, stamps and taxes, which, although interesting to the financier and political economist, are not of sufficient interest to call for special remark.

The report of Mr. Phillips is very brief and modest, considering the large amount of useful and important work performed in his department during the year. The number of samples examined was 10,653, being 666 less than in the previous year. The work performed does not belong exclusively to the Inland Revenue, for, of the above number, 1798 samples were examined for the customs and 672 for the Board of Trade. In connection with some of the customs' samples, Mr. Phillips has to repeat the old tale of traders endeavouring to defraud the revenue of spirit duty by importing such commodities as "fruit essences," "hair dye," "naphtha," etc., and declaring they contain no alcohol, when, in reality, a considerable quantity is present.

In a table at the end of the report we learn that the 672 samples examined for the Board of Trade consisted of 561 samples of lime and lemon juice, and 111 samples of spirits for fortifying the same. Of this number, 68 samples of juice and 5 of spirit were rejected, as under the standard of quality.

The number of prosecutions in which scientific chemical evidence was given was 27, and the penalties imposed by the magistrates amounted to £975, or an average penalty of upwards of £36 in each case.

The fixed assistants in the laboratory have been increased from three to five, and it is not surprising that the principal seems delighted with the change from a temporary to a permanent staff, and feels that, by having a greater number of experienced analysts, greater attention can be given to the more difficult and intricate work of the department.

The report on tobacco, though short, is a highly interesting one. It appears that, of 432 samples taken from traders for examination, not less than 312 were adulterated. The adulterants were wheat and rice starches, sugar, liquorice, lampblack, catechu and colouring matter. One sample contained 40 per cent. of sugar, and another 55 per cent. of liquorice. Two Irish manufacturers were detected using wheat and rice starches as adulterants, and from them were seized 7100 lb. of tobacco. The duty on such tobacco is 3*s.* 2*d.* per lb.; it will therefore be at once seen that these manufacturers paid very dearly for their experiments. This method of adulteration was common in Ireland in 1868, and in that year many tons of tobacco were taken from manufacturers in different parts of the country.

A calculation has been made from the quantity of tobacco on which duty has been paid during the year that the consumption of tobacco per head of the population was 1 lb. 5¼ oz., as against 1 lb. 5¾ oz. in the preceding year.

All the samples of snuff examined were *legally* genuine. It is necessary to qualify the genuineness of these samples, because snuff can legally contain both alkaline salts and lime; and as there is no fixed limit to the quantity of the alkaline salts which may be present, samples have been known to contain 50 per cent. of such salts.

60,405 lb. of tobacco and 287,686 lb. of snuff were exported on drawback; and 1031 samples taken from the former, and 459 samples from the latter, were examined for the estimation of the amount of drawback to which the exporters were entitled. Five samples only of coffee were examined during the year, one of which was adulterated with sago starch.

Nine out of fourteen samples of beer and materials used in the brewing of beer were found adulterated. The adulterants were sugar, treacle, ground rice, liquorice powder, grains of paradise and tobacco.

The report shows a falling off in the number of barrels of beer exported during the year, and, although 5848 samples were examined for drawback, there was a decrease of 213 samples.

One sample of laudanum was found to have been prepared with methylated spirit; and of nine samples sold as "finish," two were simply methylated spirit and seven contained much less than the required quantity of gum resin. Common rosin has been allowed to be used in the preparation of "finish," in addition to shellac, seedlac and sandarach. Rosin will doubtless answer for some purposes as well as the gum resins, but it is questionable whether its brittleness will not prevent "finish" made with it from being used by hat manufacturers and other traders who require a tough gum.

302 samples, representing 69,830 gallons, of wood naphtha for methylating purposes, were examined, and two only were found below the required strength.

536 miscellaneous samples were examined, and the list comprises wine, gingerette, temperance beverages, herb liquor, botanic beer, medicated spirit, peppermint, quinine wine, and a host of other substances too numerous to mention.

The Pharmaceutical Journal.

SATURDAY, FEBRUARY 17, 1872.

Communications for this Journal, and books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE REGISTER FOR 1872.

THE publication of the Register of Chemists and Druggists for the present year induces us, at the risk of a charge of too frequent reiteration, to call the attention of our readers to the necessity of keeping the REGISTRAR supplied with the information requisite to ensure accuracy in a list of so many names. There are on the Register at the present time about 13,200. No pains have been spared to make it correct, but there is good reason to believe that something like *eight or ten per cent.* of the addresses are incorrect or insufficient, owing to the neglect of registered persons. It should be as widely understood as possible that this is likely to be a matter of considerable inconvenience to those persons themselves, inasmuch as their names will probably be erased from the Register, in accordance with the provisions set forth in the 10th section of the Pharmacy Act, 1868, and the absence of a name from the Register is taken in a court of law as *primâ facie* proof that the person is not entitled to registration, and that, if carrying on business, he is doing so illegally.

There is another cause of error which does not rest with Chemists and Druggists themselves, but which they can do something to rectify. There are many deaths unreported, although Registrars of Deaths are instructed by the authorities at Somerset House to supply the REGISTRAR at 17, Bloomsbury Square, with certificates of the death of any registered Chemists and Druggists occurring in their districts. During the past year 136 deaths have been notified; but information respecting 57 of these only has been received from the Registrars of Deaths, the remainder having been reported from private sources. If the attention of the Registrars were drawn to this matter, no doubt it would be rectified to a great extent. The number of additions to the Register last year is 397; of erasures 142; the increase therefore is 255.

The Calendar for 1872 is also ready. This publication, as is known to many of our readers, is issued by the Pharmaceutical Society, for the purpose of affording information more particularly concerning that body. But besides the lists of members, the Acts of Parliament and Bye-Laws by which the Society is guided, particulars concerning the Examinations, Benevolent Fund, etc., there is a very useful Appendix, containing all the Acts of Parliament which have special interest for chemists and druggists. A list of the contents of the Calendar will be found in our advertising columns.

ADULTERATION.

THE subject of adulteration is likely once more to command attention at an early period, in consequence of the introduction of a Bill into Parliament by Mr. STANSFELD, as head of the Local Government Board, and we hope whenever there is any legislation on the subject, the fitness of properly-educated pharmaceutical chemists for filling the office of "public analyst" will not be lost sight of in Parliament.

Although the Excise authorities have the services of a considerable staff of professional chemists, their care for the subject properly begins and ends with the interests of the funds of the Inland Revenue. Latterly, however, analyses have also been conducted for the Customs and Board of Trade, as will be seen from the account given at p. 670, of the work done in the chemical department of the Inland Revenue, under the zealous and able direction of Mr. GEORGE PHILLIPS and his assistants. Although the increase in the staff of chemical assistants seems to indicate a contemplated greater activity as regards the adulterations affecting public health, past experience proves that the Excise does not take charge of adulteration in the interests of public health.

An illustration of this occurred during the earlier days of the system of methylating spirit. A large amount of abuse of this spirit was tolerated because the introduction of the system had entirely stopped illicit distillation, and saved expense and annoyance to the Excise. It was only when the new evil had augmented very largely that the present more stringent limitations of the uses of methylated spirit were imposed.

Among those articles of every-day consumption which lie under the imputation of being adulterated alcoholic beverages are, in this respect, of great importance, inasmuch as it is believed by many that their systematic adulteration with noxious materials is a fertile causes of crime. An instance in point is furnished by the Annual Report of the Chaplain to the Borough Gaol at Leeds. From this document, just published, we quote the following remarks:—

"There is one other point which has for many years past filled legislators and philanthropists with mingled feelings of alarm and sorrow. It is the increase of drunkenness as a cause of crime. I said much upon this unwelcome topic last year; but I can throw new light upon it this. It is a vulgar description of an inebriate that he has had 'too much.' It cannot in all cases be said so now. My actual experience tells me that our three, seven and fourteen days' cases are not always the victims of quantity, but quality. Added to this, it is now too generally believed that adulteration is going on to a fearful extent. The first step towards the eradication of this evil and disgrace is, as I think, to render adulteration penal, and many of the other branches of the one main scheme will be found to be self-adjusting. Within the boundary of your worships' jurisdiction are to be found retail houses, from which a customer, having partaken of one pint of malt (?) liquor, or four pennyworth of spirits, may be sent home utterly incapable of taking care of himself."

The Chief Constable of the same borough has in previous years given expression to similar opinions, that much crime could be traced to the noxious qualities of liquors vended as distinguished from their alcoholic strength, and one or two convictions of publicans for the use of grains of paradise have been recorded at Leeds.

As the town of Leeds is not specially notorious either for its amount of drunkenness or crime, it is probable that the same state of things would be found elsewhere. In the Excise Report it is stated that nine out of fourteen samples of beer, and materials used in the brewing of beer, were found adulterated; but we presume those fourteen samples were all suspected ones.

The series of articles we are now commencing to publish from the pen of Mr. Pocklington will serve to direct the attention of pharmacists not only to this point, but also more especially to the means of detecting adulterations.

In 1869, Lord E. Cecil called the attention of the House of Commons to the greatly-increased importation of *Cocculus indicus* into this country, the quantity having risen from 68 cwt. in 1857 to 1064 cwt. in 1868, an increase not accounted for by known legitimate demands. We have reason to believe that this drug is actually used by some brewers in this country, and for that reason we recently adverted to the heavy penalties that attach to the supply of it to brewers.*

HOURS OF CLOSING.

As will be seen by reference to page 673, at a Special General Meeting of the Bristol Pharmaceutical Association, the Report of the Council on hours of closing was discussed and adopted. The advisability of having regular and limited hours was recognized by the meeting; it now remains for individual members of the Association to give effect to the resolution, and thus to obviate such a failure to effect practical reform as was recently instanced by a correspondent, in a case where the same point of agreement in opinion had been reached, though in the majority of cases the resolutions passed were broken.

COUNTER PRESCRIBING.

The recent case of *Andrews* v. *Davies*,† in which the judge of the County Court decided a point of some interest to the medical and pharmaceutical bodies, forms the subject of some editorial comments in the *Medical Times and Gazette*. It is pointed out that as no "case" was asked for by the plaintiff's attorney, that interpretation of the provisions of the Medical Act in reference to "prescribing over the counter" must—for the time, at least—be regarded as law. This result is looked upon by our contemporary as one consistent with common sense and common justice. But a doubt is expressed whether the judges of the higher courts would not regard the decision as too comprehensive and too favourable to the medical profession.

CRYSTALLIZED DIGITALINE.

The French correspondent of the *Medical Times and Gazette* states that the successful candidate for the Orfila Prize at the Académie de Médecine has made a discovery likely to be of great importance in therapeutics. It is a method for the production of crystallized digitaline in a state of absolute purity. Splendid crystals resembling those of sulphate of quinine, yielding a bright emerald green when treated with hydrochloric acid, were exhibited at the last meeting of the Academy and greatly admired. This product is stated to be much more intense in its action than the ordinary preparation—half a milligram daily being as much as could ordinarily be administered—and will evidently prove to be an agent requiring extreme care in its use.

JUSTICES' SCIENCE.

The elementary instruction which it was suggested by a correspondent last week might be provided for coroners and country magistrates seems to be required sometimes by the latter body in subjects of even more general interest than the provisions of the poison clauses of the Pharmacy Act. According to *Nature*, the county magistrates at Chelmsford have declined to grant the use of the Shire Hall for a lecture on the Sun, illustrated by experiments in spectrum analysis, on the ground that the electric light might endanger the safety of the building.

We have more than once had occasion to allude to the introduction of the ipecacuanha into India, and the promise of its successful cultivation. It is well known that the Indian Government has made vigorous efforts to introduce these plants into such districts in India as are suitable for its culture; and these exertions, with the co-operation of the Royal Gardens of Kew, seem likely to be crowned with success. Dr. Hooker, in his Report to the First Commissioner of Works, says the merit of proposing the introduction of the ipecacuanha plant into India is due to Dr. Murray, Director of the Medical Staff of the Indian Army, and the operation was being energetically conducted by Dr. Anderson, late Superintendent of the Calcutta Botanic Gardens, who, at the period of his untimely death, had procured a large quantity of plants for transport to India. From Darjeeling we now learn that the few plants which were introduced then have been increased this season to over two hundred, all of which are doing well, and give fair promise of a continued rapid increase.

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* See *ante*, p. 531.

† See *ante*, pp. 515, 617.

Transactions of the Pharmaceutical Society.

ERRATA.

Page 651, col. 2, line 11, *for* Prince, *read* Prime.
„ „ line 18 from bottom, *for* Bergin's, *read* Bergius'.

Provincial Transactions.

OLDHAM CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

The Second Annual Meeting of the above Association was held at the Church Institute, St. Peter's Street, on the 10th ult.; the business of the evening commenced by the reading of the Secretary's report, which was as follows, viz.:—

Your Committee have again the pleasure of presenting a satisfactory report of the condition and prospects of your Association. Though the number of members has slightly decreased, several having left the town, and a few declined to renew their subscriptions, the Association still remains in a satisfactory condition, and on a level with many other Societies in England.

During the past session twenty-four ordinary meetings have been held, and at six of those meetings the following papers were read:—"On the Latin Language," by the Rev. A. Peaton; "On the Structure of Plants," by Mr. Bateman; "On Dispensing," by Mr. Taylor; "On Opium and its Preparations," by Mr. Lightfoot; "On Rhubarb," by Mr. Wood; "On Chamomile and its Preparations," by Mr. Potts.

Since the last annual meeting, only two members have been successful in passing any examination, but we hope during the coming session, more of our members will have the gratification of being successful, both in their Preliminary and Minor examinations.

Several donations of money from private individuals have been received, and duly acknowledged, and the *Pharmaceutical Journal* has also been received weekly.

The objects for which your Association labours, viz. the scientific education of assistants and apprentices, mutual improvement, and cordial intercourse, are so important to the whole trade, that your Committee again urges you to make them widely known amongst your pharmaceutical and other friends in business, and by thus strengthening our funds, enable us to carry out our original design, viz. the possession of premises under our own control for constant use.

As will be seen from the Treasurer's report, your Committee have a balance in hand (after paying all expenses) of 19*s.* 8*d.*

The following members were elected officers for the present year, viz.:—*President*, John Taylor, re-elected; *Vice-President*, James Radcliffe, re-elected; *Secretary*, S. Bateman; *Treasurer*, J. W. Platt.

A vote of thanks to the retiring officers concluded the business of the meeting.

BRISTOL PHARMACEUTICAL ASSOCIATION.

A Special General Meeting of the Association was held on Friday, February 2nd, 1872; Mr. TOWNSEND, President, in the chair.

The minutes of the previous meeting were read and confirmed.

The PRESIDENT stated that, in compliance with the resolution of the previous meeting, the Council had met twice to discuss the subject of the "hours of closing," and had finally agreed to present the following report:—

The Council have to report that they have carefully considered the question of the hours of closing business usually adopted by pharmacists in Bristol and Clifton, and they are of opinion that it is neither necessary nor desirable that pharmacists should keep open their places of business later than other tradesmen in their several neighbourhoods, due provision being made for the supply of necessary medicines and the dispensing of prescriptions in all cases of emergency; and that, as it is of the utmost importance alike for the safety of the public and the welfare of the future members of the trade, that all assistants and apprentices should have proper and sufficient time for study, they consider that some shortening of the hours for general business is needed.

They therefore strongly recommended all members of the trade to make such arrangements as will relieve the assistants and apprentices in time for the regular attendance upon the lectures provided by the Association; and although fully aware that special difficulties prevent the immediate adoption of a uniform hour for closing, urge upon all their brethren to support them in a movement which they hope will eventually lead to the general adoption of seven o'clock as the hour for closing their establishments, the doors being finally closed at eight o'clock.

The Council are convinced that such a change must be gradual, and be governed to some extent by the circumstances affecting various districts in the city, and they therefore consider it sufficient to submit their views to the Association, in the hope that so far as possible all members will assist to bring about a change which must result in lasting benefit to the public, the employers and the employed.

The report having been read and discussed, was eventually adopted.

It was further resolved "that the report be printed and circulated amongst the members of the trade in Bristol, Clifton and the entire district, and that the Council be requested to take such other steps as they may deem necessary to acquaint the public with these proceedings."

MANCHESTER CHEMISTS' ASSISTANTS' ASSOCIATION.

A Meeting was held at Mitre Chambers, February 6th, when a paper was read by Mr. ARKLE, entitled "Notes." In introducing his subject, the reader urged a more general adoption of Captain Cuttle's advice, "When found, make a note of," reminding those present, that knowledge was an accumulation of apparently trivial facts, which ought to be secured before they pass to the region of forgetfulness.

Reference was then made to eminent men—Bacon, Faraday and others—who owed much of their greatness to the practice of making "notes;" and these certainly different to the hieroglyphics we sometimes see, or the hasty confused specimens of writing, which, after a hour, are as unintelligible as the Chinese characters on a tea-caddy,—the labour bestowed on a paper being well-nigh wasted if the information it was intended to convey was not secured, and made available for use at some future time.

The paper concluded with several notes of difficulties met with in the ordinary routine of business.

On Tuesday, Feb. 20th, a paper on "Elementary Botany" will be read by Mr. Clarke.

LIVERPOOL CHEMISTS' ASSOCIATION.

The Seventh General Meeting was held at the Royal Institution; the President, Mr. E. DAVIES, F.C.S., in the chair.

The following donations were announced:—Current numbers of the *Pharmaceutical Journal*, the *Journal of* *the Liverpool Polytechnic Society*, the *New York Druggists' Circular*, and Diary of the *Chemist and Druggist*.

The President called attention to the contribution to the Chicago Fund, which was still open, and invited the members who had it in their power, to co-operate in its behalf.

Mr. Abraham explained the nature and object of a series of lectures on elementary botany, by Dr. Carter, at the Royal Institution, originated by the Liverpool Field Naturalists' Club, and which the associates of the Association were invited to join. Mr. Abraham then made a few observations on the preparation of liquor potassæ, promising to complete a short paper on the subject, and read it at a subsequent meeting.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

At the Meeting of this Society, on Thursday, February 1st, Dr. Frankland, F.R.S., President, in the chair, when the ordinary business of the Society had been transacted, a "Note on the Crystalline Principle of Barbadoes Aloes" was read by the author, Dr. W. A. Tilden, in which he described a new derivative of aloïn. This is chloraloïn, which crystallizes from boiling water in yellow silky needles, bearing considerable resemblance to the corresponding bromine compound bromaloïn.

Dr. C. R. A. Wright then read an elaborate paper on "The Relations between the Atomic Hypothesis and the Condensed Symbolic Expression of Chemical Facts and Changes known as Dissected (Structural) Formulæ," in the first part of which he showed the possibility of expressing chemical facts without reference to the atomic theory, and in the second examined how far these facts could be accounted for by the atomic hypothesis.

A long and very interesting discussion ensued, in which some of the speakers advocated the employment of the atomic theory to a greater or less extent, as promoting the progress of chemical science, whilst others desired its abolition.

SOCIETY OF ARTS.

At the Meeting of this Society on Wednesday evening last, a paper on "The Study of Economic Botany; its Claims Educationally and Commercially Considered," was read by Mr. James Collins. The paper commenced by pointing out the importance of the study of economic botany and its practical utility as forming the very groundwork and foundation of commerce and manufacture, and, consequently, of national prosperity. Hence, an acquaintance with the science would enable a person to take a more important place in the world's workshop, and would better fit him for the counting-house, the market, the shop or the home, either in this country or abroad. The author therefore recommended that in schools two or three hours each week should be devoted to elementary lessons on the best-known and most commonly used vegetable products, and that these lessons should be supplemented by collections of specimens, and, where possible, visits to local museums. Some remarks then followed upon the proper objects to be kept in view in the formation of museums.

The commercial importance of this subject was next more particularly referred to, and it was stated that partly from the lack of suitable knowledge no systematic efforts were made by our merchants as a whole to search the earth for its treasures. Such attempts as are made by colonists and others to introduce to the market substances which they think would prove useful are generally rendered futile from the want of ability on the part of the collector to forward such specimens as could be recognized; or, if recognized, they were often found to be obtained from two or three different botanical sources. It was suggested that a good trade or commercial museum would be of great value to merchants and manufacturers, where they might have opportunities of judging whether in some cases such substances could be utilized by them.

The cultivation of economic plants not at present under cultivation was then alluded to, and their acclimatization in localities where the various elements of success were more under control than in their native habitat. It was stated that we could not depend upon spontaneous forest growth for a regular supply of any product in considerable demand, and this was illustrated by a description of the destruction of caoutchouc-trees which goes on under the present system of collection. On the other hand, the valuable results arising from a scientific cultivation were illustrated by reference to the cinchona group. Mr. Collins urged that much good might be done by the constitution of a new society or a section of an existing one which would take steps to promote a proper investigation of this important branch of the science of botany. He suggested also as a probable source of much valuable information, the systematic examination of the numerous collections which have been made by travellers and not utilized.

PHILADELPHIA COLLEGE OF PHARMACY.

At the Meeting of the Philadelphia College of Pharmacy, on January 16th, Professor Maisch exhibited the seed of *Myristica fatua*, or male nutmeg, which he stated was occasionally found in the shops on the Continent, generally worm-eaten, in three conditions—kernel, kernel and shell, and kernel, seed-shell and mace. The flavour of the kernel and mace is greatly inferior to that of the true nutmeg and mace. He did not know to what use they were applied unless it were that of adulteration.

The Professor then exhibited a specimen of Peruvian bark and a very large cone of *Pinus Lambertiana*. The Peruvian bark, he stated, had been sent to Philadelphia, by a New York house, for Calisaya, but possessed none of its characters, having a coarsely fibrous liber, covered with a thick, soft cork. A similar, if not the same article, had been sent, also from New York, to that city as red bark.

A conversation then followed between Messrs. Procter and Maisch in regard to the cinchonas. Prof. Maisch stated that Mr. Broughton and Mr. Howard had found an unusually large percentage of alkaloids in barks from cinchona-trees cultivated in India, proving that careful cultivation increases the percentage of alkaloids.

Prof. Procter asked the question, whether the percentage of alkaloids in the younger and older bark of cinchona-trees growing in South America had ever been ascertained?

Prof. Maisch replied that Prof. Karsten, who had spent about ten years in Venezuela, was perhaps the only one who had examined, on the spot, South American cinchona bark from well-authenticated species, and found that the percentage of alkaloids increased as the young bark became older.

The Californian pine cone had been sent by Mr. Wenzell, of San Francisco, who recently read a paper before the Californian Pharmaceutical Society on the hydrocarbon obtained from another species, the volatile oil of which appears to be extensively used in California for various purposes.

Prof. Bridges then spoke of the bicarbonate of soda presented to the College from the Pennsylvania Salt Works, at Natrona (on exhibition at the last meeting), and stated that he had examined one specimen, and that several others were in course of examination by one of the students in the practical laboratory connected with the College. The specimens will probably prove to be almost free from carbonate.

Prof. Maisch stated that the specimen of capsicum, presented by Mr. Heinitsh at a former meeting, was the *Capsicum minimum*, indigenous to Mexico. Mr. Heinitsh said that it had been introduced from Mexico into several of the Southern States by some army officers, and that the name given to it by the Mexicans signified "mad pepper."—*Amer. Journ. of Pharm.*

Parliamentary and Law Proceedings.

Attempted Poisoning by Oxalic Acid.

On Tuesday, February 6th, Jane Sutton was charged at the Liverpool Borough Police Court with attempting to poison her brother, Thomas Sutton. From the evidence it appeared that a child nine years old was sent for some oxalic acid, which the prisoner afterwards put into some drink that she gave to her brother. It was stated by two of the witnesses that the person who supplied the poison was in drink at the time.

Henry Hedsbury* said he was assistant at Dr. Horrock's* chemist's shop, Scotland Road. They sold oxalic acid to any person; it was greatly used to clean brass. The oxalic acid furnished to the witness Sheath was in crystals, and was marked "Oxalic acid. Poison."

Mr. Raffles remarked that it was rather a disgraceful account which had been given, of a man not perfectly sober dealing with drugs in a chemist and druggist's shop.

The prisoner, when asked what she had to say to the charge, said that she did not mean to do anything, nor to hurt either her brother or herself. She was remanded.

Action for Supplying Wrong Medicine.

In the Consolidated Chamber in Dublin, before Mr. Justice O'Brien (10th February), a Miss O'Reilly, a draper's assistant, moved for leave to file what is termed a replication to the defences of Mr. Wells, a druggist of this city. The case, as stated by the plaintiff, is as follows:—In the month of December last, Dr. Barker prescribed for Miss O'Reilly aromatic iron mixture, which she got, but on sending for a fresh supply, the bottle, which was accompanied by the original prescription, was filled with tincture of perchloride of iron. On taking half a wineglassful of the contents, her tongue became contracted, and her mouth swollen. She was sent to Jervis Street Hospital. She stated that from that hour until the present time, she had been unable to attend to her business. Mr. Nolan, on her leaving the hospital, gave her a certificate, stating that the medicine she had taken was of an injurious nature. Afterwards Dr. Nolan called upon her, and stated he had been commissioned to offer her £20 to settle the action, which the plaintiff agreed to accept. The replication that plaintiff's counsel wished to file, was that this compromise was effected by deliberate misrepresentation and fraud on the part of Mr. Nolan, acting for Mr. Wells.

Mr. Seeds, who appeared for the defendant, stated that he should be able to controvert this when the proper time came, and that plaintiff expressed her perfect willingness to accept £30.

His lordship said he thought it a clear case for granting liberty to file the replications.

Mr. Wells is a druggist of considerable standing in Dublin.

* Neither of these names occur on the Register of Chemists and Druggists for this year.

Review.

On Fluid Meat. A New Preparation of Meat, especially adapted to Weak Stomachs and for Invalids generally, with Remarks on Food. By Stephen Darby, F.C.S., Pharmaceutist, etc. London: J. & A. Churchill, New Burlington Street.

The author commences this pamphlet with the following modest declaration:—

"Any addition to the knowledge of human food, or any new variation imparted to it, must be interesting to all persons, but more especially to medical men at the present time, when the regulation of diet has become an essential point of practice. I therefore trust it needs no apology or further preface in offering this small pamphlet to their notice and consideration."

To pharmaceutists also we venture to think that it will prove equally interesting as the work of an accomplished practical chemist, an old pupil of the illustrious Liebig and Will, well known as the translator of Wittstein's 'Pharmaceutical Chemistry,' and remembered by most of the younger generation as formerly and for many years an amiable examiner in chemistry on the Board of Examiners of the Pharmaceutical Society.

Mr. Darby first alludes to the ignorance of the general public and deficiency of knowledge possessed by many medical men of the chemistry of food, and points, as an example to be avoided in the future, to the varieties of *pure* starches bearing high-sounding names, which are so frequently and ignorantly recommended as food for children and delicate persons.

Brief remarks follow on the chemical constitution and physiological properties of animal flesh, in which the importance, as *nutritives*, of fibrin, albumen, gelatine, as well as extractives and salts, in restoring the body and repairing the daily waste, are insisted on; and we are then led to the consideration of the qualities of beef tea prepared by various methods, and value of Extractum Carnis "Liebig" as an article of diet.

Our author refers to Von Bibra's analysis of dry lean beef, from which it appears that 14 per cent. only of the original weight of meat is extracted in the manufacture of Liebig's extract, so that 86 per cent. of the total amount of dry solid material, containing the most nutritive and valuable constituents, are entirely lost.

Authorities, both medical and pharmaceutical, differ widely as to the value of beef tea made with Extractum Carnis; and an interesting discussion on this subject took place at the Edinburgh meeting of the British Pharmaceutical Conference. The balance of evidence tends to show that the extract has been vastly over-rated; that while it undoubtedly possesses valuable qualities, they are rather stimulant, as chemists would infer from the presence of kreatine, kreatinine, sarcosine, etc., rather than to any great extent *nutritive*. Like ordinary China tea, it seems to stimulate and prevent waste, and to be similarly incapable, without the addition of other substances, of supplying the place of solid animal food.

Liebig himself has, with commendable candour, admitted the imperfection of the preparation which bears his name as containing that portion only of the meat soluble in water. This will be seen from the following communication to the *Lancet* in 1865, respecting his Extractum Carnis, which was then beginning to excite attention. He says, "Were it possible to furnish the market at a reasonable price with a preparation of meat combining in itself the albuminous, together with the extractive principles, such a preparation would have to be preferred to the Extractum Carnis, for it would contain the nutrient constituents of meat."

And again, speaking of his own preparation, he says, "I have already stated that in preparing the extract of meat, the albuminous principles remain in the residues; they are lost for nutrition, and this certainly is a great disadvantage."

At the suggestion of Dr. Pavy, of Guy's Hospital, Mr. Darby undertook some experimental investigations to determine the practicability of making a preparation which should contain all the constituents of lean meat in a soluble form, and he claims to have succeeded in the production of his fluid meat now in the market.

The process, which we quote *in extenso*, and which has been patented, is an extension of one first proposed by Dr. Wm. Marcet, F.R.S., in 1867.

"Lean meat, finely sliced, is digested with pepsin in water previously acidulated with hydrochloric acid at a temperature of from 96° to 100° F. until the whole of the fibrine of the meat has disappeared.

"The liquor is then filtered, separating small portions of fat, cartilage, or other insoluble matters, and neutralized by means of carbonate of soda, and finally, carefully evaporated to the consistence required, namely, that of a soft extract.

"The resulting extract represents in all its constituents the lean meat employed, but with the fibrine, albumen and gelatine changed into their respective peptones or soluble forms. This change is effected solely by the pepsin and hydrochloric acid, or artificial gastric juice, without the evolution or absorption of any gas or the formation of any secondary products.

"But this process, whatever care be taken, leaves the fluid meat with a strong *bitter* taste, which always attaches to meat digested with pepsin. In order to remove this bitter taste, I have made very many experimental researches, and at length have discovered that the purpose is completely and satisfactorily effected by the addition, in a certain part of the process, of a small proportion of fresh pancreas.

"The fluid meat so prepared is entirely free from any bitter flavour."

One ounce by weight, or a large tablespoonful, equals the quantity of extract, obtained by boiling, from twenty ounces of meat.

As thus prepared, it possesses a full meaty flavour. Having tried it repeatedly dissolved in water as beef tea, and spread on bread-and-butter as a sandwich, we can bear witness to its agreeable flavour, and, so far as we could judge, it appeared to confer greater *staying* power on the stomach than equal weights of Extractum Carnis.

Hitherto the manufacture of fluid meat has been confined to this country; but it is obvious that if the author's process prove as generally satisfactory as it promises, the flocks of South America and Australasia will be required to supply meat in sufficient abundance to admit of its being carried on at a cost low enough for general consumption. Meanwhile it seems very desirable that pharmacists, as well as medical men, should test the fluid meat whenever practicable. The former are, equally with the latter, the confidants of the public in things dietetical, and it behoves them to keep themselves abreast of every improvement in the preparation of food. Moreover, when a member of the Society devotes time and skill of no common order to the solution of a problem of *national* importance, the assistance and advice of his *confrères* should not be wanting.

If Mr. Darby's process continue as successful on an extended scale as it appears to have been during the last few months, he will have earned the congratulations of every member of the trade and deserve the gratitude, not only of dyspeptics and other invalids, but of all mankind.

Obituary.

DR. DAY, F.R.S.

A physician and medical writer of some eminence, Dr. George Edward Day, who has just died, was for a number of years professor of medicine, and one of the examiners for the M.D. degree in St. Andrew's University. Dr. Day was born in 1815 at Tenby, South Wales. He received his first education at Pembroke College, Cambridge, where he took a wrangler's degree in 1837. From Cambridge he proceeded to Edinburgh, where he enrolled as a student of medicine, and soon rose to distinction in the several classes, gaining the gold medal in two successive years for the best thesis on anatomy and physiology. In 1843, Dr. Day took up residence in London as physician to the Western General Dispensary, in the New Road, a post which he subsequently resigned for that of lecturer on materia medica at the Middlesex Hospital. In this capacity he laid pharmaceutical doctrine under considerable obligations by the lucidity of exposition and the neatness of experiment which he brought to bear on the subject. In 1844 he became a member, and in 1848 a Fellow, of the Royal College of Physicians, and from that time engaged to some extent in the periodical literature of his profession, contributing, among other journals, to the *Medico-Chirurgical Review*. He also translated from the German and French authors on physiology, and was an active supporter of the Sydenham Society. He assisted in founding the Pathological and Cavendish Societies; and in 1850 became a Fellow of the Royal Society. An accomplished and versatile rather than an acute or profound *savant*, Dr. Day leaves behind him many warm personal friends to regret his decease, which (as our readers may remember) was accelerated by an accident sustained some years ago in the course of a tour in Wales.

MR. JOSEPH KERNOT, NAPLES.

We are sorry to have to record the death of Mr. Joseph Kernot, proprietor and founder of the British Pharmacy in Naples, which took place on Tuesday, the 26th of December last, after a severe attack of complicated nervous fever.

Mr. Kernot established himself in Naples in the year 1826, and died at the ripe age of seventy-one. Distinguished alike for honesty, probity and enterprise, he met with the greatest success in his business, and was, as a contemporary there expressed it, the Nestor of Neapolitan pharmacists. He was a member of the Pharmaceutical Society of Great Britain and of the University of Naples; received a prize medal in the Dublin Exhibition in 1865 for pharmaceutical products; and was lately appointed *farmacista* to the royal household of Italy.

MEETINGS FOR THE ENSUING WEEK.

MONDAY, Feb. 19. — *London Institution*, at 4 P.M.—"Elementary Chemistry." By Professor Odling. *Medical Society*, at 8 P.M.

TUESDAY, Feb. 20. — *Royal Institution*, at 3 P.M.—"On the Nervous and Circulating Systems." By Dr. Rutherford.

WEDNESDAY, Feb. 21. — *Society of Arts*, at 8 P.M. *Royal Microscopical Society*, at 8 P.M.—Annual Meeting.

THURSDAY, Feb. 22. — *Royal Society*, at 8.30 P.M. *Royal Institution*, at 3 P.M.—"The Chemistry of Alkalies and Alkali Manufacture." By Professor Odling.

FRIDAY, Feb. 23. — *Royal Institution*, at 9 P.M.—"Social Influence of Music." By Mr. H. Leslie. *Quekett Club*, 8 P.M.

SATURDAY, Feb. 24. — *Royal Institution*, at 3 P.M.—"The Theatre in Shakspeare's Time." By W. B. Donne. *Royal Botanic Society*, at 3.45 P.M.

The following journals have been received:—The 'British Medical Journal,' Feb. 10; the 'Medical Times and Gazette,' Feb. 10; the 'Lancet,' Feb. 10; the 'Medical Press and Circular,' Feb. 14; 'Nature,' Feb. 10; the 'Chemical News,' Feb. 10; 'English Mechanic,' Feb. 9; 'Gardeners' Chronicle,' Feb. 10; the 'Grocer,' Feb. 10; the 'Journal of the Society of Arts,' Feb. 10; the Madras 'Monthly Journal of Medical Science' for January; 'Medical and Surgical Reporter,' Dec. 30; 'Pharmaceutische Zeitung,' Jan. 31 and Feb. 7; the 'Practitioner' for February.

Notes and Queries.

**** In order to facilitate reference, correspondents are requested to mark their answers in each case with the title and number of the query referred to.*

No notice can be taken of anonymous communications. All queries or answers should be accompanied by the name and address of the writer.

[300.]—MEDICINAL ROOTS IN SPAIN.—Forment is Maize, or Indian Corn. American Cissampelos is *Pareira brava*.—JOHN TULLY, *Brighton*.

PHOSPHATE OF ZINC.—Having recently dispensed this salt from the prescription of a very eminent London physician, my attention was directed to the absence of any mention of it in the common handbooks of pharmacy and materia medica. It occurred to me that a simple formula for its preparation might not be unacceptable to those who may be called upon, as I was, to dispense it at short notice, and might possibly prevent the discredit which would ensue to the dispenser if he delayed, in order to obtain from a wholesale house in London or elsewhere, a compound so easily made at home. The following is the formula I used successfully:—

Take of Sulphate of Zinc, 861 grains
Phosphate of Sodium, 716 grains
Acetate of Sodium, 272 grains
Boiling Distilled Water, 20 ounces.

Dissolve the sulphate of zinc in four ounces of the water, and the phosphate and acetate of sodium in the remainder. Mix the two solutions, stir well together; let the precipitate subside; decant, and wash by decantation twice or thrice, then transfer to a paper filter, and wash with distilled water until the filtrate ceases to become turbid with a solution of chloride of barium; then dry on a water or sand-bath at a moderate heat. The product was a soft snow-white powder weighing 430 grains, 43 grains of which, when strongly heated in a porcelain crucible, were reduced to 35. The theoretical quantity of $Zn_3 2 PO_4$ obtainable according to the subjoined equation is 385 grains; but the salt evidently retains three or four molecules of water when dried at a moderate heat, and their expulsion might be accompanied by decomposition of the phosphate into pyrophosphate—

$$3\,ZnSO_4 7\,H_2O + 2\,Na_2HPO_4 + 2\,NaC_2H_3O_2 = Zn_3 2\,PO_4 + 3\,Na_2SO_4 + 2\,HC_2H_3O_2.$$

Phosphate of zinc resembles in composition ferrous phosphate, and the mode of preparation is the same; acetate of sodium being added in each case to prevent the liberation of sulphuric acid.—J. FRED. BROWN, *Dover*.

ELIXIR QUINIÆ, FERRI ET STRYCHNIÆ PHOSPHATIS.—Mr. Charles Shivers, jun., publishes the following formula in the December number of the *American Journal of Pharmacy*. He states that it furnishes a very agreeable tonic, not so intensely bitter as solutions of either of the alkaloids themselves.

℞ Quiniæ gr. xxx
Ferri Pyrophosphatis gr. lx
Strychniæ gr. j
Acidi Citrici gr. xxx
Alcoholis f℥ij
Syrupi f℥iss
Aquæ Aurant. Flor. f℥iss
Glycerinæ f℥ij
Aquæ Destill. q. s. ad f℥viiss
Aquæ Ammon. q. s.

Dissolve the iron in f℥ss of water; mix the syrup, glycerine, and orange-flower water, and add to the solution of iron; then add ℥ss of alcohol. Dissolve the quinia, with 5 gr. citric acid, in ʒj water and ʒj alcohol, by the aid of heat; then mix with the iron and syrup solution. Dissolve the strychnia in the remainder of the alcohol, and add to the other solution; then add the remainder of the citric acid, in powder, with enough liquid ammonia, until it becomes clear, using a little heat after the acid is added. The quinia solution must be of the same temperature as the iron when added, also with the others when added. This gives a beautiful straw-coloured elixir, representing about 1 gr. sulphate of quinia, 1 gr. pyrophosphate of iron, and $\frac{1}{60}$th gr. strychnia in the fluid drachm.

GUM ARABIC IN THE SOUDAN.—The collection of gum arabic in the Soudan is not made, as is sometimes represented, by means of incisions in the trees, but the gum exudes naturally through the bark, upon which it coagulates in lumps of various sizes. The natives then collect it by beating it off with long switches. It is noticed that the oxidation is greater, and the gum superior in quality, in proportion to the intensity of the heat and the length of the dry season. In favourable seasons it has a beautiful transparency, and the pieces are larger and more friable, which are conditions required for the finer sorts. When, on the contrary, the rains are early and persistent, the collection is less abundant; the gum is affected by the humidity; it hardens, becomes yellow, and acquires a greyish tint, that causes it to lose its transparency. In such years gum of fine quality is difficult to procure. It is well known that in the years when the inundation of the Nile rises higher than usual,—a sign of abundant rains in the higher regions,—fine gums are rare or completely wanting.—*Bull. de la Soc. de Géographie*, from *Journ. de Pharm. et de Chimie*.

BREAD MADE WITH SEA-WATER.—In the *Union Médicale* for February 6, M. Rabuteau refers to the use of bread made with sea-water as increasing the appetite and stimulating digestion. He states that it is pleasant to eat, and exercises a beneficial medicinal influence in cases of dyspepsia, phthisis and scrofula. It has also been found conducive to health on board ship during long voyages.

SEPARATION OF MAGNESIA FROM POTASH AND SODA.—H. Scheerer publishes in the *Journal für Praktische Chemie* (iii. 476) a new method of separating magnesia from potash and soda. It consists in evaporating a solution of the chlorides mixed with oxalate of ammonia to dryness in a platinum crucible. The residue is then dried, heated at first gently, and then to dull redness, treated with water, boiled and filtered. Magnesium carbonate will remain in the filter, while potassium and sodium carbonates will be found in the filtrate. This process is said to yield good results, but sulphates must not be present.

PARAFFINED PAPER.—Dr. W. R. M'Nab recommends, in the *Medical Times and Gazette*, a trial to be made of paraffined paper as a cheap and light covering for dressings. It is prepared by first saturating a thin sheet of paper with an excess of paraffin, and afterwards removing the excess by placing the sheet between blotting-paper, and passing a hot iron over it.

[305.]—STAINED IVORY.—"*Ebur*" would be glad to know of any process by which ivory, that is yellow and greasy, can be restored to its original appearance.

[306].—OIL OF HOPS.—*J. Harding* asks for information respecting the distillation of the essential or volatile oil of hops, which has the aroma of new hops.

[307.]—DIAMOND CEMENT.—*A. M. B.* wishes to be favoured with a formula for Diamond Cement, made with acetic acid.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Pharmaceutical Education.

Sir,—I have no desire to enter into a personal controversy with Professor Siebold, so shall decline to encounter that not very difficult task of defending my former letter against his remarks in your issue of to-day.

My only reasons for calling attention to the said lecture was the belief therein expressed that many of the statements were calculated to mislead students; and, further, that those opinions were not shared in by pharmaceutists generally.

I am quite willing to submit to Mr. S.'s charges of inconsistency if I have succeeded in placing before your readers any remarks which may induce them to carefully read the lecture for themselves, and having done so, I am sure that many of my opinions will be endorsed by them.

Benjamin Keen.

Uppingham, February 3rd, 1872.

Sir,—That "a Manchester Pharmacist" should attack a "person" instead of a principle, in your columns, is, to say the least, discourteous. The doctrine of the Manchester School teaches,* that for the physical, and consequently for the mental, welfare of mankind, it is necessary that the absolute and exclusive right of every one to that which he produces with the means at his own disposal (such as his money or his knowledge), should be recognized and secured to him by law; and that beyond this, law has nothing whatever to do with the matter. So that an advanced test of education, and restrictive pharmaceutical legislation, would naturally be opposed by these *doctrinaires* as pernicious and protective innovations.

A paradox contains more truth than logic; and as your Manchester and Dover correspondents are not paradogmatists, I will develope my meaning in a few words.

If more than one-half of the candidates for the Major and Minor examinations (in the list from which I quoted) failed to pass, I endeavoured to show that it mainly resulted from their faulty early education. Obtain a better-educated class through a severer Preliminary examination before apprenticeship; and, *cæteris paribus*, fewer would fail in the Major and Minor. And I still persist in claiming a higher arithmetical test with the elements of algebra and mathematics as necessary for the proper comprehension of the chemical theories. In stating these views I am happy to know that I am echoing the sentiments of many of my *confrères*. That my plea for higher education should have called forth splenetic personal abuse and misplaced satire instead of the dignity of argument, is no fault of mine. I have lived much abroad, where pharmacists are received in society as professional gentlemen, on account of their educational prestige, and my sincere hope and aim is to see the like in England, and hear more of professional studies and less of trade-marks, drudgery and shop.

Ernest J. T. Agnew.

P.S.—To satisfy my hypercritical commentator, I must add that where the castor-oil bean is cultivated, the plant is called Palma Christi, and has as much reason to be named castor-oil palm as *Cochlearia officinalis* has to be called scurvy-grass.

Sir,—Is the British pharmacist a shopkeeper *pur et simple*, or a member of a learned profession?

These questions have to be answered before we can arrive at any rational conclusions as to the amount of education the public has a right to expect in those who practise pharmacy. Probably few pharmacists will hesitate long ere they answer—perhaps more than half indignant that the query had been thought needful—that they are undoubtedly of the "professional class." Nor, so far as dispensing chemists are concerned, can, I think, this be greatly denied. At any rate, whether the full concession of professional standing be granted or not, this much must be conceded, that the man to whom is entrusted the dispensing of a physician's prescription should be on a higher level than the retailer of tapes and cotton, or pepper and mustard. It is not worth while, in the present instance, to consider the standing of the mere retailer of drugs. That the dispensing chemist is at the same time a shopkeeper is not to be questioned. So likewise are many surgeons; so, in a sense, are all professional men if the selling a thing constitute the shopkeeper. But there is something beyond the mere selling of drugs expected of the "chemist," and that something, comprised in the term dispensing, constitutes to my mind the pharmacist's just claim to be regarded as a member of a profession, and not a mere shopkeeper. This something is outside the competency to judge of the purity of the articles sold, which is expected of ordinary shopkeepers, and includes a knowledge of their properties. It is rightly expected that the butcher should be able to judge the quality of his beef, but it is nowhere or nowhen expected that he should be familiar with its dietetic value. It is rightly expected that the grocer should be able roughly to pronounce upon the genuineness of the tea he sells, but no one expects him to be competent to say with what other things it may be taken or with what it may not be taken, nor to be able to say what quantity can be safely administered at one time. Still less is it expected that he should revise the orders of his customers, and correct them if he think more is ordered, or in improper proportions, than is correct or safe. Now, of the dispensing chemist all these things are rightly expected. He should be able to detect adulterations, should be a judge of the quality of the articles he sells. He must be familiar with their properties, with their action upon the system and upon each other; and he must know in what proportions they may be safely administered, and possess sufficient self-confidence to enable him to point out any error he may detect in the prescriptions of those he is daily taught are above him in social position, and immeasurably above him in attainments and knowledge of the very subject at issue. All these things the dispensing chemist has expected of him; and he tacitly claims to be able to meet these expectations when he styles himself "dispensing chemist."

Such being the case, the question of how little education can we escape with appears to me sadly out of place. Pharmacy will never occupy its true position amongst the professions until pharmacists learn to respect their profession too much to permit them to seek to lower the standard of their professional education; they must, *au contraire*, continue to raise that standard in accordance with the progressive march of general education and culture. Hence it appears to me that Mr. Siebold's lecture† is singularly ill-advised, and that pharmacists generally should speak with no uncertain sound on the subject.

The prevailing tendency of thought amongst pharmacists appears to lie in the direction, that nothing more should be required of candidates for admission on the register than a bare proficiency in the usual routine of the daily work of the profession. And this is, at first sight, such a common-sense view of the subject, that the prevalence of this opinion is not surprising. But it is forgotten that the duties of the dispensing chemist are such that there is, properly speaking, no daily routine. "Each day brings its own work" in the chemist's shop in a peculiarly true sense, and requires something more than a familiarity with the usual (or average) routine. For example, I lately saw a prescription which had been the round of several dispensing chemists in a large town, none of whom could dispense it properly, although they had all apparently tried a different method with it. It at last came into the hands of the very chemist who had had the least business experience, but who happened to have a wider culture and a fair general scientific knowledge. His first attempt to dispense the prescription failed. He pondered the matter, saw the cause of his failure, tried afresh, succeeded, and thus secured a good and profitable customer. Now this was a case—one probably out of hundreds—where "outside" knowledge proved of service.

The sore point with Mr. Siebold appears to be botany, of which he does not see the "pharmaceutical value." Nor, at first sight, is it easy to be seen, excepting in the case of those who are likely to enter upon the collection of indigenous herbs. But botany has a direct pharmaceutical value, as appears in the following extract from a paper read at the Glasgow Chemists and Druggists' Association, by Mr. M'Millan. He says, "I have here on the table a sample of 'Conii

* See Lord Hobart's article in the current number of the *Fortnightly Review*.

† Pharm. Journ., January, 1872.

Fructus,' bought in June last by our Vice-President, Mr. Brodie, as the genuine article; but he (Mr. Brodie) found it to be largely adulterated with the fruit of *Anthriscus vulgaris*, or common beaked parsley, which I may mention, in passing, is highly poisonous. Mr. Brodie showed this specimen to Professor Hennedy, of this University, who pronounced it to be largely adulterated with a number of species of the *Umbelliferæ;* but, as Mr. Brodie had stated, the fruit of *Anthriscus vulgaris* was most prominent." It is exceedingly doubtful whether any but a very fair botanist would have detected the admixture, or, at any rate, have pronounced its nature.

Above and beyond the practical use of botany, and, as I think, of incalculable value, is its educational value.

For cultivating the power of exact observation and keen discernment, with rapid and logical generalization, there is no study which is even remotely comparable with that of botany; and these are the very qualities which the pharmacist most requires. Hence on this ground I would, if botany had no practical value, urge its retention as a part of the examination curriculum. At the same time, it does not follow that it should be imposed as a part of the Minor or Major examination only; its proper place of *entrée* is the Preliminary, in which case its study would form, as the natural sciences should form, a part of the school routine. Were the Preliminary examination made more severe (technical subjects, as the reading of prescriptions, being excluded), and required before apprenticeship, we should soon cease to hear complaints of difficulty in passing the Minor, soon have a superior class of men in the profession, and—what a blessing!—cease to see the *quasi* tobacconist and chemist shops that so often appear to lead their proprietors into the *Gazette* or worse. And we should, in addition, find little need for complaint of counter practice and other illicit transactions. That there would be fewer applicants for admission into the profession, and that assistants would become scarce, is beyond a doubt; but these things would work round with rise in prices and enhanced "respectability." The form which pharmaceutical education should take is a subject into which I cannot now, from want of space, enter.

HENRY POCKLINGTON.

THE CHOICE OF A MICROSCOPE.

Sir,—All students who possess a microscope must have hailed with pleasure the commencement of a series of articles in the Journal upon that department of microscopy of most utility and interest to them; and those who do not already possess an instrument will, in addition, thank Mr. Pocklington for his advice concerning the purchase of one.

I can but think, however, that he should not have omitted to advise intending purchasers to provide themselves with a binocular microscope; for, while the cost is certainly somewhat in excess of the prices mentioned in his article, the advantages are assuredly many and great.

The comfort, relief, and freedom from injury to the sight, consequent upon the conjoint use of the eyes; the stereoscopic projection, the superiority of penetrating power, and the smaller amount of fatigue, are some among the benefits resulting from its use.

Mr. Pocklington has mentioned Mr. Swift as a maker of cheap and good instruments. To this fact I can bear explicit testimony. His prices are moderate, while his workmanship is excellent, and in particular his students' lenses are at least equal to those of any other maker.

Moreover, one of his cheap binocular stands fitted with his arrangement of the analysing prism, and his modification of the Webster condenser (a veritable *multum in parvo*), is one with which study can be carried on with the smallest possible trouble, and without loss of time.

In the arrangement of the polariscope above alluded to, the analysing prism is carried in a sliding-box, which brings it into position immediately above the binocular prism. This method combines the use of the polariscope with the binocular without the trouble of screwing and unscrewing, etc. It possesses also the advantages of giving more light, and less distortion than in the ordinary modes of mounting this prism. True, the power of rotation is here lost; but is not this more than compensated by the convenience and other merits of the arrangement? The polarizer is carried on a large diaphragm attached to the condenser, and rotates beneath a smaller diaphragm provided with a clear aperture and two selenite films. I have been thus minute in speaking of this arrangement, under the conviction that the polariscope must frequently be called into requisition in the course of Mr. Pocklington's articles, and under the assurance that so great a saving of time as is here effected is by no means a small desideratum.

There are other stands in which this arrangement of the analysing prism obtains, but as the same box carries both this and the binocular prism, the sliding in of the one displaces the other, so that when using the polariscope the instrument becomes monocular.

One other indispensable appurtenance remains to be mentioned, viz. a stage capable of rotation in the optic axis of the microscope, than which none can be more suitable or less expensive than that devised by M. Nachet. To those seeking a compact instrument, to which additions can at any time be made, one of the above description appears to me to be of the greatest utility.

In conclusion, let me express the hope that the articles of Mr. Pocklington will well explore the interesting field of microscopy in which he has proffered his guidance; and that we may have cause to remember his teaching as a great and lasting good.

R. L. CHURCHYARD.

112, *Camden Road, February 7th*, 1872.

POUNCE.

Sir,—In Mr. Jackson's note on the *Algerian Callitris* in your number of Feb. 3, he speaks of the powdered resin, (commonly called *Gum Sandarach* or *Gum Juniper*) having been formerly used in lieu of blotting-paper.

It was certainly called *Pounce*, but it was employed not to absorb superfluous ink, which simple purpose some cheaper powder would have effected quite as well, but to render parchment or the abraded surface of paper more suitable to write upon.

In the *Encyclopædia Britannica* (1797) we read—

> "Pounce, gum Sandarach pounded and sifted very "fine, to rub on paper, in order to preserve it from sink-"ing, and to make it more fit to write upon."

And in Guibourt's *Histoire des Drogues* (1849) under the head *Résine Sandaraque*—

> "* * on l'emploie aussi réduit en poudre, sur le "papier déchiré par le grattoir, afin d'empêcher l'encre "de s'y répandre et de brouiller l'écriture."

A common practice with chemists when they have to write on a wooden box, is to rub the surface with a little powdered mastich or common resin,—a simple precaution that prevents the ink running.

The custom of using an absorbent powder instead of blotting-paper is still universal in France and Italy. The composition of the powder so used varies in different places. In the new reading-room of the Great Library in Paris, small trays of fine sawdust are provided in company with the inkstands.

D. HANBURY.

THE BENEVOLENT FUND.

Sir,—Many letters have appeared in the Journal, advocating the increased support of the Benevolent Fund, some of which deserve careful consideration. I have, however, been surprised that no one has hitherto thought of "Hospital Sunday" at Birmingham, or "Colston's Day" at Bristol. In addition to these two well-known schemes for the benefit of local charities, there is another, which, though not so well known perhaps, is still more deserving the consideration of the pharmaceutical profession; I mean the "simultaneous collection" made by the commercial travellers throughout the kingdom on a given day for the benefit of their Benevolent Fund and Orphan Schools. The result of this collection is generally from £800 to £1000 every year; and a trustworthy friend of mine informs me that he does not believe it interferes with the annual subscription. I think the "simultaneous collection" might, without much trouble, be tried for the Pharmaceutical Benevolent Fund, to its great benefit; and I hope that I may before long see announced in your columns the establishment of "Benevolent Fund Monday."

A SUBSCRIBER.

Hours of Closing.

Sir,—The thanks of all chemists and druggists are due to Mr. Giles, for his able and exhaustive paper on "Hours of Closing." In offering a few criticisms on some of his statements, I must say that fifteen years' experience in a style of business probably very similar to his own leads me to endorse his views generally. There is no doubt but that we invite the greater part of this most wearisome drudgery, and nothing but a general determination on the part of principals to refuse submission to it will ever remedy the evil. In my own experience I have seen the hours of business curtailed, with the most satisfactory results to all concerned, and my impression is that efficient young men will more than ever shun situations where "it is all work and no play." I may, perhaps, be allowed to say that I have often wandered about between the hours of 10 and 11 P.M., after heavy day and evening duty, delivering parcels, returning to my "home" (*sic*) literally exhausted. Let masters sanction intentionally a few convenient omissions in attending to late orders, or kindly but firmly state to the superior servants of establishments that late work is most undesirable, and I venture to say that not a single customer will be offended, and a greater spirit of loyalty will be evoked among the *employés*.

Now one word as to the number of hours we ought to work. Surely Mr. Giles does not seriously suggest twelve hours per day, with turns at extra and Sunday duty to boot! If this be an improvement, what is our present condition? If this be the goal, Heaven save us from it! Ten hours a day, inclusive of time for meals, with turns at evening and Sunday duty is surely long enough to endure the mental strain which a constant attention to minutiæ entails. Mr. Giles is quite correct in saying "that no doubt we all of us, as masters, have worked for longer periods" (than twelve hours); but assistants are to be excused if they decline to believe that masters, as a rule, do anything like the number of hours of work that he specifies. Moreover, masters, as a rule, may; assistants must. My own recollection of masters, as a class,—certainly of those whose successors we should like to be,—is of men comfortable in life, taking their long daily walks, or actively sharing in local public business. The first half of the day so spent, makes attention to business in the afternoon and evening rather an agreeable change than otherwise. Such being the case, assistants may surely be excused if, after twelve or fourteen hours' toil, in the course of "treatment as members of the family," they are permitted either to lounge in the dispensary amid uncongenial surroundings, or to sally forth on the cold, comfortless, unwelcoming thoroughfares, or (shall I say it?) to sit down to digest Attfield, Royle, or Bentley,—they do grumble, and say, as probably the majority of those who deign to read these lines have said, "we wish we had never seen the business." That better times, better pay and shorter hours, are ahead, I firmly believe, if only we avoid Mr. Siebold's fallacies, and patiently cultivate the abilities which alone will improve our condition.

An Assistant.

Sir,—As the subject of Sunday closing has been lately referred to in connection with that of the early closing movement, I, as an advocate for moral persuasion in preference to more stringent measures, recommend the circulation of a handbill similar to that enclosed, which has had the effect of considerably reducing the amount of Sunday labour in my own business, and without in any way giving offence to customers.

George Nind.

Wandsworth, S.W., January 29th, 1872.

"Persons requiring medicine on Sundays are respectfully requested to restrict their purchases, as far as possible, to what is absolutely required; for while the dispensers of medicines feel it their duty to supply the public on that day whenever illness occurs, yet the necessity of recreation and rest to themselves, and a desire to attend public worship, induces them to appeal to the kind consideration of those who may not have viewed the subject in that light."

Sir,—Having read with deep interest the letters by our provincial friends on this subject, I now write on behalf of the London assistants.

Much indignation has been expressed at the words of an opposer of early closing; but happily, proprietors, as a rule, advocate it. What a bright contrast to Mr. Stead's address do we find in one delivered in November last by the President of the Bristol Pharmaceutical Association! (Pharm. Journ. 3rd Ser. Vol. I. p. 432.) What is said there on the subject will convince the assistant that he has some of the greatest representatives of the trade to advocate his cause in a truly noble and philanthropic manner.

In one letter the assistants of London are called on to make an effort. But London chemists are, as a rule, more tardy than the provincials. On laying the case before a West-End pharmaceutist, and giving him, among other examples, Bristol, he shrugged his shoulders, and replied, "Ah, they can do it there, because they are fortunate in having several influential chemists who take the lead." But, I ask, has not London plenty of such men? Certainly, and willing ones, too; the only desideratum is unanimity. One chemist, whom I "almost persuaded," excused himself from closing half an hour earlier on the plea that, if he closed earlier, G—, round the corner, would get his best customers, who were not in the habit of going to his shop until after 9 P.M. Such are the difficulties of London canvassing; but if a few of the leading chemists would come forward, like Mr. Stables, there would be little difficulty. The library at Bloomsbury Square would be better attended on Tuesday and Friday evenings, if assistants could get away before 9 P.M. on what is termed their "evening off." At present, they get out only in time for such recreations as a theatre or music hall can give.

Associate.

Pharmaceutical Examination.—We have received a communication from a "*Minor Associate and Candidate for the Major*" in reference to Mr. Agnew's letter (*ante*, p. 638), in which an opinion is expressed that the increase in the number of subjects for examination advocated by that gentleman is not desirable, but rather a thorough acquaintance with those at present included in the Regulations of the Board of Examiners. An objection, also, is expressed to the suggested annual inspection of the herbs, roots, etc., in English pharmacies.

James Harding.—The figures in Royle are correct, according to the old notation. The difficulty arises from your having taken the equivalent of anhydrous citric acid instead of crystallized, as will be evident upon reading the description given. The equivalent of crystallized citric acid is 210. Your other question we have placed in the Notes and Queries' column.

The Preliminary Examination.—We have received a letter from "*An Assistant,*" in which he urges the number of hours during which he is engaged in business as an obstacle to his preparation for the Preliminary examination. But if our correspondent be correct in stating that he has received a "fair middle-class education," we are at a loss to conceive any difficulty that would interfere with his passing that examination, or any reason why he would require further preparation for it.

M. P. S. H.—Neither of the articles you mention is included in the schedule of substances referred to in the restrictions provided by clause 17 of the Pharmacy Act.

"*A Medical Dispenser.*"—Business capacity does not, to our knowledge, form the subject of any public examination, except as it is indirectly indicated by the candidate's other acquirements. We differ from our correspondent's opinion that a pharmacist who possesses a thorough scientific acquaintance with his calling, is therefore likely to find it a less lucrative one.

J. H. Pearson.—The Natural System.

"*Inquirer.*"—See Watts's 'Dictionary of Chemistry,' vol. ii. p. 661.

H. H. (Dartmouth.)—The following form for arsenical soap is taken from Cooley's 'Cyclopædia of Practical Receipts':—Carb. potash, 12 oz.; white arsenic, white soap and air-slaked lime, of each, 4 oz.; powdered camphor, $\frac{3}{4}$ oz.; made into a paste with a sufficiency of water.

"*St. Kilda.*"—Messrs. Evans, Lescher and Evans, London; Messrs. Southall and Dymond, Birmingham; Mr. L. Siebold, Manchester.

"*Chemicus.*"—See Watts's 'Dictionary of Chemistry,' vol. iv. p. 256.

Communications, Letters, etc., have been received from Mr. A. H. Mason, Mr. Butterworth, Mr. Newbury, Mr. Gostling, Mr. Jackson, Mr. Harding, York Chemists' Association, A. P. S.

ILLUSTRATIONS OF SOME PHARMACEUTICAL PROCESSES AND APPARATUS.*

As Exhibited to the Class in the Philadelphia College of Pharmacy.

BY PROFESSOR E. PARRISH.

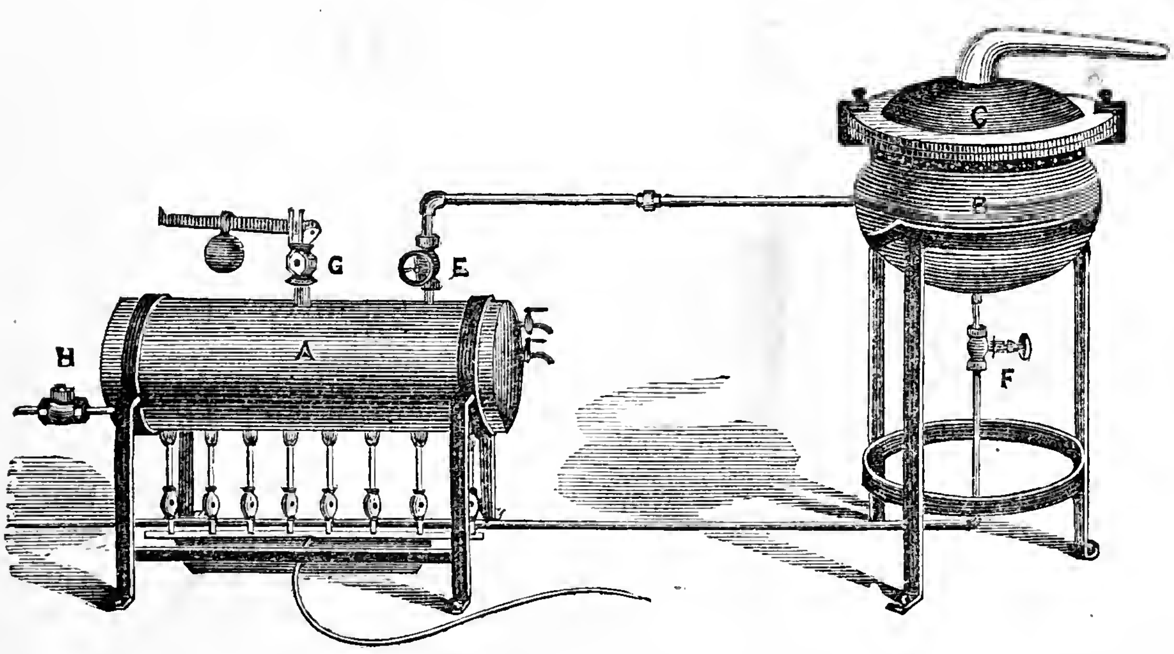
The illustration of a course of lectures in pharmacy gives an opportunity for noting carefully details and results which in common practice are overlooked, or, if observed, are not made public.

The processes detailed in this essay were conducted at the Philadelphia College of Pharmacy, in presence of the large class of students, with such facilities only as a lecture-room, with its counter, sink, hydrant, and gas-supply afford.

The energies of the lecturer being mainly directed to explanation and oral instruction, an assistant is employed in the management of the several processes simultaneously going on during the lecture; to his skilful assistant, Jos. P. Remington, the writer acknowledges himself indebted for useful suggestions, especially in the construction of the steam-evaporating apparatus herein described.

Immediately after a statement of the scientific facts and principles pertaining to the generation and application of heat in pharmacy, the process of evaporation and the apparatus suitable for the preparation of extracts are brought into view, models and drawings are used for some, while evaporating-dishes, sand-baths, steam-baths and water-baths are shown in actual use.

The annexed drawing shows a steam-boiler, evaporating-pan and still-head constructed for the purposes of this course of instruction. A is a boiler of $\frac{1}{8}$ inch thick (No. 10 wire gauge), copper, 1 foot 9 inches long by 7 inches in diameter. It is held in position by a stout iron frame, at an elevation of 12 inches, so as to allow of a stand of 8 Bunsen burners to be so placed as to spread a clean flame over the entire length of the bottom. Each of these burners has a tube $\frac{3}{8}$ inch diameter and $5\frac{1}{2}$ inches long. The water-supply pipe, which is seen on the extreme left, is $\frac{1}{2}$ inch in diameter, and has a valve at H which closes when not in use. The two small water-cocks are designed to ascertain the elevation of water in the boiler. A $\frac{3}{8}$ inch steam-pipe connects the boiler with the steam jacket.



The evaporating-pan B, set in an iron frame 20 inches high, consists of a concave dish of tinned copper, 1 foot in diameter, 6 inches deep, with a steam jacket and a brass flange $1\frac{1}{2}$ inch wide riveted on to it.

The dome, C, is of copper, and has a similar flange, by which it is designed to be clamped on to the evaporating-pan when the apparatus is used for distillation. This junction is made steam-tight by a coil of lamp wick interposed between the flanges. The drip pipe from the steam jacket empties into the adjacent sink; it is, for convenience, readily separable. The steam-pipe being connected by a coupling, the different parts of the apparatus may with facility be separated from each other. The gas burners are connected by elastic tubing with a T pipe in the counter.

The first preparation made in this apparatus was *Extractum Gentianæ*, U. S. P. The percolation was previously started in a cylinder of tinned iron, with a stop-cock attached. 96 troy ounces (6 lb. 9 oz. av.) of ground gentian, somewhat coarser than that which would pass through a No. 40 sieve, was macerated in sufficient cold water thoroughly to saturate it, then packed in the percolator and water added till about a gallon of dense percolate had passed. This was introduced near the beginning of the lecture into the evaporating-pan, and steam turned on. In a few minutes the liquid was in active ebullition; after boiling a short time it was removed and strained, but without yielding a precipitate of insoluble matter; the strained liquid returned was rapidly inspissated till the close of the lecture. The percolation continued yielded about 2 gallons additional of percolate, which with the first portion was evaporated in the interim to a soft pilular consistence, and the finished extract exhibited at the following lecture. The product weighed 2 lbs. 11 oz. av.=41 per cent., which might have been somewhat increased if the percolation had been longer continued, though without profit. The gentian, at 16 cents per lb., which included the cost of powdering, cost \$1.08; the fuel may be estimated as costing 36 cents. The extract, therefore, cost in the aggregate \$1.44=52 cents per lb. It was of superior quality, of rich brown colour, and with a decided odour of the root.

Extractum Jalapæ, U. S. P.

Two pounds, avoirdupois, of finely powdered jalap was moistened with 6 fluid ounces of alcohol, sp. gr. ·835, and packed in a strong 10-inch glass funnel, which was suspended over a suitable receiving vessel. Alcohol was added till about 4 pints of tincture had passed; then water was gradually poured on, and its progress watched till it had nearly reached the perforated cork diaphragm fitted above the neck of the funnel. Another receiver was now substituted, and, the supply of water being kept up, 6 pints of aqueous percolate was received. The success of the last part of this process was more complete than was anticipated with so fine a powder of jalap, a perforated cork diaphragm of about 2 inches diameter

* Reprinted from the *American Journal of Pharmacy*, January, 1872.

being used and the shape of the funnel favouring the swelling of the powder on the addition of water, without unduly compacting it, so that when the aqueous menstruum had begun to pass, the dropping continued moderately fast throughout. The quantity of menstruum, though less than that indicated in the Pharmacopœia, was limited to such amount as could be conveniently evaporated during the time at our disposal, and, as the result proved, gave a fair yield of extract.

At the second lecture on extracts the alcoholic percolate from the jalap was introduced into the evaporating-pan, and the dome clamped on to it, as shown in the drawing; and to this a large glass Liebig's condenser was attached, and connected with the hydrant and sink by elastic hose. Steam being generated, which occupied about ten minutes, the alcohol was rapidly recovered, and at the close of the lecture, the dome being removed from the pan, a dry mass of resinous extract was obtained, which weighed 6¾ oz. (av.) and 40 grs., nearly 21·4 per cent. of the jalap used. The alcohol had scarcely lost in quantity, but was not free from the odour of the drug. The aqueous percolate was evaporated to a syrupy consistence, after the lecture, removed from the pan, and divided into two equal parts. The resinous mass was dissolved in a pint of the recovered alcohol, and also divided into two equal parts. A half part of the resinous and aqueous liquids were now mixed, as directed in the process of the Pharmacopœia for the whole, and the mixture being evaporated gave 6¼ oz. of an excellent dry hydro-alcoholic extract.

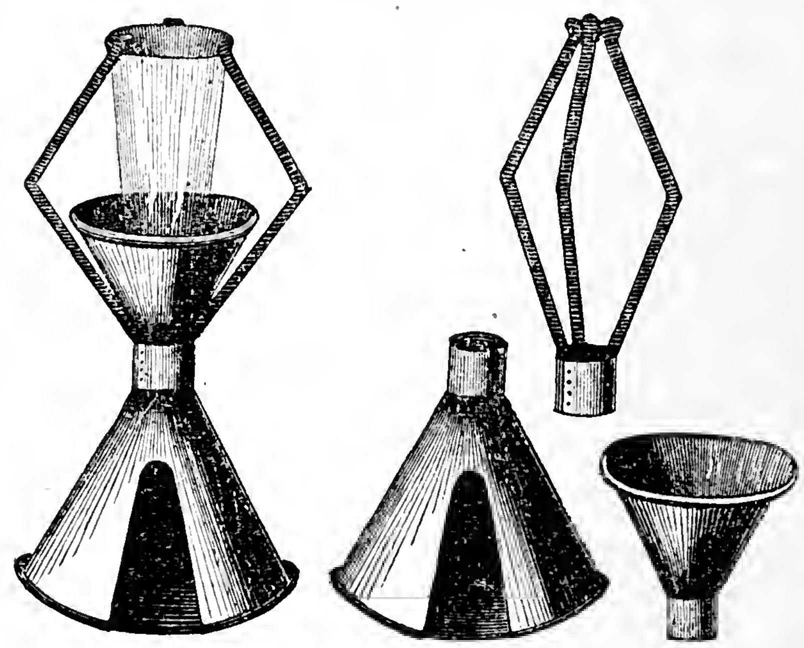
Two pounds of jalap having been used, this quantity, being one-half the whole yield, represents the yield per pound=39 per cent. The powdered jalap cost 65 cents per pound, the alcohol (half the quantity used) 55 cents, the heat, estimated, 20 cents, giving an aggregate cost of the 6¼ ounces, $1.40. Deducting alcohol recovered and useful for a similar process, 50 cents, we have a cost of 90 cents, or $2.14 the cost of a pound, less than half the market price of the best extractum jalapæ.

The object in setting aside half of the alcoholic solution of resinous extract was to ascertain the proportion it would yield of the officinal resina jalapæ. Accordingly, at the next lecture it was diluted to half a pint and added to 4 pints of water. The precipitate, washed by several portions of water, collected and dried, yielded 2 ounces of the officinal resina jalapæ, or 12½ per cent. of the jalap used. The cost of this was about 70 cents per ounce.

The question of economy in evaporation is of practical interest in connection with the preparation of these extracts by the use of a steam-boiler, and is an element of inaccuracy in these estimates. The process being suspended and resumed involves a loss of fuel, and there is no doubt but that much waste occurs from there being too many burners under the boiler. Six burners instead of eight would serve the purpose, though the rapidity of getting up steam would be lessened.

Extractum Nucis Vomicæ, U. S. P.

Twelve troy ounces of finely-powdered nux vomica, moistened with four fluid ounces of alcohol, were introduced into a cylindrical glass percolator, adapted to a receiving bottle, and percolated with alcohol till nearly 4 pints of tincture were obtained, care being taken to displace the last part of the alcohol by water. To obviate the inconvenience of holding a percolator with one hand while filling and packing it with the other, George M. Dougherty, a member of the present class, has devised the instrument here figured, which is an improvement upon one invented by T. C. Conard, of last year's graduating class.

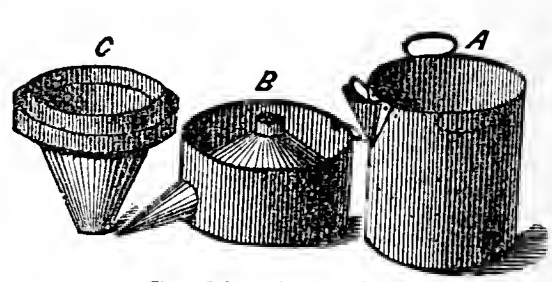


"The manipulator" consists of two funnels of zinc, one fitting over the other at the smaller end, and a ring, with three springs attached, fitting securely over the outer one. A conical percolator is held in place, while being packed, by the shape of the funnel; but when a cylindrical percolator is used, the springs are slipped on, and hold the percolator in a vertical position while it is being packed, and afterwards if desired.

The larger funnel has an opening by which a receiving vessel can be introduced under the percolator, held in position above; or an argand burner may be placed in it, and an evaporating-dish, containing a liquid to be evaporated, on the upper funnel.

The recovery of the alcohol from the tincture of nux vomica was accomplished by the use of the pharmaceutical still, with water-bath attachment, here figured.

This differs from Procter's, figured in Parrish's Pharmacy, 3rd edition, p. 297, in having a water-bath, C, into which the condenser, B, fits by a water-joint. There should also be a water-joint on the outer-vessel, A. The tincture being introduced into the water-bath, C, this was then placed in A, which was half filled with water, and surmounted by B. Being at the opposite end of the counter from the hydrant and sink, water was supplied to the refrigerating surface from a vessel of tinned iron with a small tubule near the bottom, so elevated as to discharge on to the top of the still, and a larger one was placed on the counter to receive the warmed water flowing from it. A gas stove supplied the heat to the water-bath, and before the expiration of the hour all but about 3 ounces of the alcohol had been recovered. The semifluid extract was poured into a tared capsule and further evaporated over a draught of warm air to a solid consistence. The yield was 10 drachms=10·4 per cent. The cost, deducting the cost of alcohol recovered, was about 28 cents per ounce.



Combination Still.

Chapters for Students.

CHEMICAL NOTES TO THE PHARMACOPŒIA.

BY WILLIAM A. TILDEN, D.SC. LOND.

DEMONSTRATOR OF PRACTICAL CHEMISTRY TO THE PHARMACEUTICAL SOCIETY.

Potassii Bromidum.—Bromine is added in successive small portions to any convenient quantity of solution of potash, until there is a slight excess, as indicated by the pale brown colour assumed by the liquid. The change which ensues on the solution of the bromine consists in the partition of the potassium between the bromide and bromate which result, the latter consuming half of the oxygen.

$$5KHO + KHO + 3Br_2 = 5KBr + KBrO_3 + 3H_2O.$$

The solution is evaporated to dryness, the residue mixed with a little charcoal and thrown into a red-hot crucible. The oxygen of the bromate is then carried off in the form of carbonic oxide gas.

$$5KBr + KBrO_3 + 3C = 6KBr + 3CO.$$

The resulting bromide is then dissolved out and crystallized.

The action of bromine upon hydrate of potassium is exactly parallel to that of chlorine, and also to that of iodine. In each case corresponding compounds are formed.

Chloride .	KCl	Chlorate .	$KClO_3$
Bromide .	KBr	Bromate .	$KBrO_3$
Iodide . .	KI	Iodate . .	KIO_3.

It may here be observed that the order of relative stability is not the same in the two classes of compounds, for bromine will displace iodine from an iodide, and chlorine will displace bromine from a bromide, so that evidently in the chloride the chemical affinities concerned are the most powerful. On the other hand, iodine can, under suitable conditions, displace bromine from a bromate, or chlorine from a chlorate, producing an iodate. This is in fact the method usually adopted for making potassic iodate. (See B. P. App. II.) Whilst iodic acid, HIO_3, and anhydride, I_2O_5, are easily prepared, the bromic and chloric acids are bodies of extreme instability, and the anhydrides, Br_2O_5 and Cl_2O_5, are at present unknown.

Bromide of potassium crystallizes in cubes which are indistinguishable from those of iodide of potassium.

Of the following tests from the Pharmacopœia, the first indicates that it is a salt of potassium, the second that it is a bromide, and the third that it is free from iodide. [§ Its aqueous solution gives a white crystalline precipitate with tartaric acid; when its solution in water is mixed with a little chlorine, chloroform agitated with it, on falling to the bottom, exhibits a red colour. A solution of the salt mixed with mucilage of starch and a drop of an aqueous solution of bromine or chlorine, does not exhibit any blue colour.]

Potassii Iodidum.—Substituting iodine for bromine in the process last described, the details are precisely the same.

Iodide of potassium generally forms opaque cubes, the faces of which are regularly excavated, but occasionally it is met with in transparent octahedra. [§ It commonly has a feeble alkaline reaction; its solution mixed with mucilage of starch gives a blue colour on the addition of a minute quantity of chlorine. It gives a crystalline precipitate with tartaric acid. The addition of tartaric acid and mucilage of starch to its watery solution does not develope a blue colour.] The last test requires explanation; the object of it is to detect iodate of potassium, which is an exceedingly objectionable and even dangerous impurity. Neither iodide nor iodate of potassium alone give free iodine on the addition of tartaric acid, but simply hydriodic and iodic acids respectively.

$$KI + H_2C_4H_4O_6 = HI + KHC_4H_4O_6$$
$$KIO_3 + H_2C_4H_4O_6 = HIO_3 + KHC_4H_4O_6.$$

But when they are mixed, these two acids being generated in presence of each other react with formation of water and iodine.

$$5HI + HIO_3 = 3I_2 + 3H_2O.$$

[§ Solution of nitrate of silver added in excess forms a yellowish-white precipitate which, when agitated with ammonia, yields by subsidence a clear liquid, in which excess of nitric acid causes no turbidity.] If chloride were present, it would be dissolved out of the silver precipitate by the ammonia, and the addition of nitric acid to the clear liquid would throw it down again.

There should be but traces of carbonate present in good iodide of potassium, and therefore solution of lime should be almost unaffected by it.

Iodate of Potash.—[§ Appendix II. B. P.] Finely powdered iodine and chlorate of potassium are boiled together with water very slightly acidulated with nitric acid. When the colour of the iodine has disappeared, the solution is evaporated to dryness, in order to drive off the nitric acid, and the residue is redissolved in water.

The reaction is interesting, as illustrating what has already been indicated as to the relative stability of the oxygenated acids of chlorine, bromine and iodine. Iodine and potassic chlorate, heated together in the absence of nitric acid, do indeed give iodate and free chlorine, or rather chloride of iodine—

$$KClO_3 + I_2 = KIO_3 + ICl;$$

but the reaction takes place very slowly. The addition of a little nitric acid hastens the reaction. It liberates from the chlorate successive small portions of chloric acid, which are in turn converted by the iodine into iodic acid, until the whole is so changed. Each portion of iodic acid, as it is produced, decomposes the nitrate of potassium which was temporarily formed, and so ultimately, potassic iodate, chlorine and nitric acid are the only resultants.

$$2KClO_3 + I_2 + x\,HNO_3 = 2KIO_3 + Cl_2 + x\,HNO_3.$$

Iodate of potassium is employed as a test for sulphurous acid in acetic and other acids.

$$\underset{\text{Iodate of Potassium.}}{2KIO_3} + \underset{\text{Sulphurous Acid.}}{5H_2SO_3}$$
$$= \underset{\text{Iodine.}}{I_2} + \underset{\text{Acid Sulphate of Potassium.}}{2KHSO_4} + \underset{\text{Sulphuric Acid.}}{3H_2SO_4} + \underset{\text{Water.}}{H_2O}.$$

The iodine thus liberated is recognizable by its colour or by the usual reaction with starch.

CINCHONA CULTIVATION IN JAVA.

In a very interesting report on the trade and commerce of the island of Java, we read that "the cinchona cultivation, under the special care of the Government, is increasing yearly. Besides the twelve plantations in the Preanger Residency, Government are experimenting in the Passœrœan Residency and in Sumatra. Seeds and plants have also been granted to private persons on application, and several landed proprietors have established small plantations which promise well, and are likely to be enlarged.

A quantity of cinchona bark was sent during 1870 to Holland for realization, and the prices ranged from 1 florin 2 cents to 1 florin 40 cents per pound. The medical service here has also been supplied. The entire last year's crop was over 9000 pounds bark, and the expenses of cultivation, including salaries, etc. slightly exceeding £3500.

The following is a list of the various descriptions of plants in the Government plantations in December, 1870:—

Cinchona Calisaya and *C. Hasskarliana*	1,177,951
C. succirubra and *C. caloptera** . . .	167,964
C. officinalis	287,849
C. lancifolia	45,777
C. micrantha	758
Total . . .	1,680,299

Of the Government Botanical Gardens at Buitenzorg, we are also told that they "are well known over the East for their extent and beauty, as well as for their botanical value; they are under the charge of Dr. Scheffer. Frequent exchanges of plants occur between the Buitenzorg Gardens and those of many of the British Colonies."

THE PREPARATION OF PEPSIN.

BY LIONEL S. BEALE, F.R.S.

The following remarks of Dr. Beale on the preparation of "pure digestive powder or pepsin from the pig's stomach," are taken from a lecture published in the *Medical Times and Gazette*:†—

"Various chemical processes more or less complicated have been employed in the preparation of pepsin. Partly in consequence of these being tedious and difficult of performance, and the results uncertain, and partly from the sale of perfectly useless preparations, the remedy has to some extent lost its reputation. Many years ago, when engaged upon some experiments on artificial digestion, and after having met with considerable difficulty in obtaining clear solutions that would filter, I tried various new plans of preparing digestive fluids; and from the circumstance that the pig was an omnivorous animal, with a very strong digestion, and his stomach to be easily procured for a small sum, I was led to try his pepsin in preference to that of any other animal. The following mode of preparation was found to answer very satisfactorily. It is very simple, and free from many of the objections to which other processes are liable.

"The mucous membrane of a *perfectly fresh* pig's stomach was carefully dissected from the muscular coat, and placed on a flat board. It was then lightly cleansed with a sponge and a little water, and much of the mucus, remains of food, etc., carefully removed. With the back of a knife, or with an ivory paper-knife, the surface was scraped very hard, in order that the glands might be squeezed and their contents pressed out. The viscid mucus thus obtained contains the pure gastric juice with much epithelium from the glands and surface of the mucous membrane. It is to be spread out upon a piece of glass, so as to form a very thin layer, which is to be dried at a temperature of 100° over hot water, or in vacuo over sulphuric acid. Care must be taken that the temperature does not rise much above 100°, because the action of the solvent would be completely destroyed. When dry the mucus is scraped from the glass, powdered in a mortar, and transferred to a well-stoppered bottle. With this powder a good digestive fluid may be made as follows:—

Of the powder	5 grains.
Strong hydrochloric acid . .	18 drops.
Water	6 ounces.

Macerate it at a temperature of 100° for an hour. The mixture may be filtered easily, and forms a perfectly clear solution very convenient for experiment.

"If the powder is to be taken as a medicine, from two to five grains may be given for a dose, a little diluted hydrochloric acid in water being taken at the same time. The pepsin powder may be mixed with the salt at a meal. It is devoid of smell, and has only a slightly salt taste. It undergoes no change if kept perfectly dry, and contains the active principle of the gastric juice almost unaltered.

"The method of preparing this pepsin was communicated to Mr. Bullock, of the firm of Messrs. Bullock and Reynolds, 3, Hanover Street, Hanover Square, who at once adopted it for the preparation of medicinal pepsin, and soon improved upon it in some particulars. The dose is from 2 to 4 or 5 grains. *Test:* ·8 grain of this pepsin, with 10 drops dilute hydrochloric acid and an ounce of distilled water, dissolve 100 grains of hard-boiled white of egg in from twelve to twenty-four hours. In the body probably twice this quantity of white of egg or even more would be dissolved in a comparatively short space of time. The digestive powder prepared from the pig's stomach retains its activity for any length of time if kept dry. I had some which had been kept in a bottle for upwards of five years, and still retained its active power unimpaired. The solution made with this pepsin and hydrochloric acid was nearly tasteless and inodorous. One pig's stomach, which costs 6*d*., will yield about forty-five grains of the powder prepared as above described.

"Gradually the usefulness of this preparation of pepsin of the pig was found out, and it had to be prepared in increasing quantities. I should be afraid to say how many pigs' stomachs have been used of late years during the winter season.

"In 1857, Dr. Pavy carefully examined the pepsin prepared and sold by many different firms, and found that this dried mucus of the pig's stomach was the most active of them all (*Medical Times and Gazette*, 1857, vol. i. p. 336). In 1863, Professor Tuson instituted a still more careful comparative examination, and with a similar result (*Lancet*, August 13, 1870); for he found that this preparation was *twenty-five times stronger than some others that he obtained for examination.*

"I have purposely abstained from writing about the value of this preparation since the note I first published concerning it in 1856. It has, however, been used largely by many practitioners ever since, who are thoroughly convinced of its usefulness. I have often given it to patients, who did not know what they were taking, but were quite satisfied of the improvement which resulted; and I have tested its usefulness in many different ways. It is often extremely valuable in treating the diseases of young children, and I believe that persons greatly advanced in age may sometimes be kept alive by it."

* We do not know to what species this refers.—Ed. Pharm. Journ.

† February 10, 1872, p. 152.

VOLUMETRIC ANALYSIS.*

BY W. GILMOUR.

(*Concluded from page 669.*)

Acetic Acid.—One of the next substances my attention was called to was acetic acid, in determining its strength for the making of solution of acetate of ammonia and other preparations into which it enters. The results I have obtained were not much more satisfactory than in the former case, although there generally was a much closer approximation to the standard strength.

I have said they were not much more satisfactory, for we must bear in mind two things—I might almost say three—in considering the strength of this substance: first, the many important compounds and preparations into which it enters, determining more or less their relative strengths; second, the reduction of the strength of the Pharmacopœia preparation so as to conform to that of the commercial acid; and third, the easy adaptability of its strength to that of the standard, and we may also add its permanency, in contradistinction to the nature of such a substance as sulphurous acid, of which we have just been speaking.

The following table will show the varying strengths in half-a-dozen different samples I have from time to time lately tried:—

ACETIC ACID.

182 grs. acetic acid = 1000 divisions solution of soda = 33 per cent. $HC_2H_3O_2$ (Monohydride) = 28 per cent. $C_4H_6O_3$ (Anhydrous).

Sample 1	= 29·7 p. c. $HC_2H_3O_2$	=	25·2 p. c. $C_4H_6O_3$.	
„ 2	= 30·36	„	25·76	„
„ 3	= 31·68	„	26·88	„
„ 4	= 31·84	„	27·02	„
„ 5	= 32·01	„	27·16	„
„ 6	= 38·61	„	32·76	„

It will be observed that Sample 1 is about 10 per cent. below the standard strength, and betwixt Samples 1 and 6 there is a difference of above 25 per cent.

Looking thus at the results we get some little idea of their unsatisfactory nature, but which we are very apt to overlook or forget, taking any of them individually. The 38·61 per cent. may by itself be considered a pardonable offence, but taking it in conjunction with another acid, such as Sample 1, as much below the standard, the consequences are neither to be lightly estimated nor connived at. Especially is this apparent in such an important compound as Mindererus Spirit, where the difference of strength, if made from samples such as these, would vary in extent one-fourth less or more as the case might be. All the above acids answered moderately well to the different tests for impurities—fixed impurities, metallic ditto and foreign acids—sulphuric, sulphurous and hydrochloric, so that they were good in every respect saving the one of strength.

Hydrocyanic Acid.—This, it will be at once granted, considering the potency of the compound, its frequent use by medical men in prescriptions, its important therapeutical effects, and the general instability of its strength, is not altogether an unimportant or unfit subject for study to the pharmaceutist. I began by making a few experiments as to the storing of it in bulk, etc. which I cannot say brought out anything new on the subject, although they generally confirmed what is already known. For example, that storing it in bottles—small in preference—quite full, obscured, tightly stoppered and finally inverted, will keep it good an indefinite period; that is to say, as long as the retail chemist under ordinary circumstances requires to keep it: but on the other hand, a larger bottle, not quite full (and the smaller the contents the more certain the reduction), will never be stable in strength, even under otherwise most favourable circumstances.

All this was known before, but I further tried how much acid would be lost in a given time out of a given quantity taken from the ordinary dispensing bottle which had been opened only for dispensing purposes. I must confess I was somewhat struck with the results, more especially as this is a loss I have never seen estimated in a similar way that I am aware of, and I was consequently not prepared to find it so large. I found that in a 4-oz. bottle opened on an average once a day, and a quantity, ranging probably from a few drops to a dram, or probably more occasionally, taken from it, the loss in the course of a fortnight was nearly one-third per cent. For example, one quantity I had in, and which was certified to be B.P. strength, but which on examination I found was actually 2·14 per cent., under the above circumstance and in the above time was reduced in strength to 1·83, thus losing in that time ·31.

I need not say that here every care was exercised in the keeping and dispensing of this sample, so that no undue loss might take place; and I therefore conclude that under less favourable circumstances, a higher temperature or a less accurately-fitting stopper, for example, the loss might even be considerably greater. I have always found, however, that under similar circumstances to the foregoing the loss existed in nearly an equal ratio. My observations lead me to remark one or two other features in the use of this acid, none of which can be said to be unimportant when we consider the substance with which we are dealing. One is the unsatisfactory nature of a mixture containing this acid, especially if the mixture be ordered in considerable quantity, and dependent on this acid to any extent for its therapeutical effects. There is no possibility, so far as I know and have tried, of getting an uniform result in strength, first in the dispensing of such a mixture, and second and more especially in *its use after dispensing.* In the first case there is all the probability, so far as my experience goes, of an acid in one respect or another not standard in stock, and even where there is of its not being the proper strength *after* it has been dispensed. For example, if this acid is added first to a mixture ordered in some quantity, and the other ingredients added *to it*, the strength is not the same as if it were immediately added before being corked. The evil, moreover, is all the greater if the acid is put, say, into a 12-oz. or 16-oz. bottle, and is then filled up directly from the stock-bottle, say either of a simple infusion or plain water, as not unfrequently happens. The evil here is a double one, for there is not only the loss of acid, but there is also its escape into the stock-bottle, and in no inconsiderable quantity, as I have over and over again demonstrated. In the second instance, viz. in the use of such a mixture, there is scarcely a possibility that any two doses can be exactly alike in strength, as the very cork by which the bottle is closed, and the frequent opening of the bottle, effectually precludes the idea.

All this may prepare us for a difference in the strength of samples received from manufacturers and wholesale dealers, but it most certainly *does not* excuse the fact of such a variation, or the necessary acceptance of it by the pharmaceutist. The following table shows the variations in strength of several different acids I have from time to time lately examined:—

HYDROCYANIC ACID.

1000 divisions solution of nitrate of silver = 17·0 grs. nitrate of silver = 270 grs. dilute acid = 2 p. c. HCN.

Sample 1	= 3·0 per cent.	Scheele's strength.
2	= 4·28 „	
3	= 2·92 „	
4	= 4·60 „	
5	= 1·07 „	B. P. strength.
6	= 2·14 „	
7	= 1·83 „	
8	= 1·90 „	

The first four of the foregoing samples were war-

* Read at the Meeting of the North British Branch of the Pharmaceutical Society, January 1st, 1872.

ranted Scheele's strength, and the remaining four B. P. strength; and whether we take the one or the other the results are alike unsatisfactory. We have in both cases an acid not much above half the proper strength, whilst all the others fluctuate betwixt the two extremes, and none are exactly of a proper standard strength. It will, I think, be granted from the foregoing table and remarks generally that a personal examination of every sample, not only *introduced* into the stock of the pharmaceutist but also of all kept any time in stock, is absolutely necessary.

Saccharine Carbonate of Iron.—This is another substance I have been paying some little attention to lately, having at first had my attention drawn to it from the striking difference in colour and general appearance of the different samples which came under my observation. In placing before you some results at which I have arrived, I grant it would have been more satisfactory had I also been able to state somewhat of the history of each sample, giving, for example, its age, the conditions under which it had been kept, etc.; but I am unable to do so, and it probably will matter the less, seeing some of the results arrived at are quite independent of any such influences. I may state here that so much was I struck with the results which are shown in the accompanying table, that in case of any mistake in the results obtained, I in each case, with a single exception, sent a duplicate sample to a practical chemist, to whom I am much indebted for his kindness, not only on this occasion, but also on many others, for entering with me into this inquiry, and other ways rendering me much help. I may also state that I sent him samples of most of the acids as well. In testing the irons he used the permanganate test, I adhering to the Pharmacopœia bichromate as being less liable to error in the hands of a non-adept, but the results under both systems were substantially the same, in no case varying 1 per cent., and in most cases varying only a mere fraction. The table comprises seven different samples, the eighth being a special one, to which I will afterwards make reference.

SACCHARATED CARBONATE OF IRON.

1000 divisions bichromate solution = 14·75 grs. bichromate = 16·8 grs. iron from proto- to persalt.

	$FeCO_3$	Fe_2O_3		Total Fe.
Standard	37· per cent.	6· per cent.	=	21·9
Sample 1	26·27	11·8	=	20·81
2	33·02	4·54	=	19·11
3	24·75	11·03	=	19·66
4	21·32	15·77	=	21·33
5	28·29	9·21	=	20·10
6	32·56	5·29	=	19·41
7	22·2	6·36	=	15·16
8	46·0	a trace	=	22·

Looking, in the first place, at the amount of carbonate only in each sample, the result is somewhat staggering and most unsatisfactory. Samples 4 and 7 contain fully a third less than the standard amount of carbonate, 1 and 3 more than a fourth less, and 5 just over the fourth. It was this which led me in each case to estimate the amount also of peroxide present, so that some idea might be formed as to where the evil was, whether in the formation of peroxide from carelessness in making the carbonate, or in the actual absence of the iron itself.

This last I was at first inclined to suppose would be the case, as it might not unreasonably have been supposed where results so far from the mark existed, some explanation might have been given either as to the abstraction of some of the precipitate by the siphon during the process of washing, or, what was equally likely, the addition of an excess of sugar, and thus the loss of carbonate not altogether imputed to the formation of peroxide. The estimation of the peroxide, however, showed this was only partially correct, in so far as it brought out with a single exception, a moderately close approximation to the standard percentage of *pure iron*, as is also shown from the accompanying table. We are therefore shut up, I think, to one of two conclusions from the results arrived at in connection with these samples, viz. first, that the protosalt had already been converted into a persalt previous to the formation of the carbonate, which might not unlikely have been the case were the commercial sulphate of iron used; or second, and what I think the more probable conjecture of the two, that there had been great carelessness in allowing the iron to get oxidized during the formation and washing of the carbonate. We cannot imagine that by a peculiar coincidence *all* the samples were aged, no more than it is legitimate to say that they were all recently made, although I have good reason for supposing that some of them were, and that none were exceedingly old. But indeed I am inclined to think the fault is entirely, or nearly so, confined to one of the two first conclusions above mentioned, or probably to both combined, as from experiments I have made I have found that any oxidation *after* the conclusion of the process or in the storing of the carbonate, even under the most favourable circumstances for the formation of the peroxide, is very inconsiderable, if, indeed, there be any at all. For the purpose of trying this, and also for the purpose of trying the Pharmacopœia process experimentally for the making of it, I shortly after beginning with some of these experiments, made a sample myself, the result of which is shown in sample 8 of the table above. I was exceedingly careful in the weighing, mixing, washing, etc. and for the iron I took the quantity required from one of the purest specimens of sulphate I think I ever saw. The result as will be seen was in every way satisfactory. There was only a mere trace of the peroxide on testing, and the carbonate stood about a half per cent. *more* than the actual possible strength by the Pharmacopœia process, granting that there was no oxidation at all in the making.

I need not enter into conjectures as to how this might have taken place, although I think the explanation easy enough. A small quantity only of the carbonate was made, and a very little less or more of any of the ingredients would account for the fact, but what I want to note is, that this sample has been exposed for the purpose of allowing the formation of peroxide, but as yet it is not present to any appreciable extent; and this sample, it must be remembered, was in every way a favourable sample for its formation, seeing it contained, so to speak, an excess of carbonate. I have, therefore, come to the conclusion that the sesquioxide is formed only in very minute quantity after storing, and more especially if any care at all is displayed in the mode of storing; and that in every case where the higher oxide is present in any quantity, as it is in most of the above samples, it has been formed during the process, or it has previously existed in the protosalt. I may state here that I have invariably used the zinc in preference to the protochloride of tin, as being the simpler process of the two, and also the least susceptible to error.

In placing before you the foregoing results, it may be said that I have fixed on unfortunate samples on which to experiment, in so far at least as two of the substances are concerned, seeing the one is so apt to change in strength (acid), and the other so difficult to make of the proper standard strength (iron); but this, I apprehend, is one of the greatest arguments we could get in favour of this system of testing being adopted by each of us. We have the means, or can have them always at command, for applying them; they occupy but little time in application, and are thoroughly simple, and the spirit and meaning of my paper will only be half understood, if I have failed to show that an examination from time to time of substances we *may have in stock* is as necessary as an examination of what we daily take into stock.

ESSENTIAL OILS.*

BY J. H. GLADSTONE, PH.D., F.R.S.

PART II.

Eight years ago I communicated a paper on essential oils to the Chemical Society, and in concluding it I promised a further communication, with experiments on the oxidized oils, and a fuller account of the chemical and physical history of some of the hydrocarbons. Shortly after the paper was printed, a series of unforeseen events took me almost wholly away from my laboratory; other scientific inquiries then engrossed my thoughts; and so the research on these essential oils was long laid aside. Now, however, I will endeavour to fulfil my promise, though not to carry out my whole design.

Before entering on any new observations, I wish to refer to some criticisms on my paper which Mr. Daniel Hanbury kindly sent me. They relate to the plants from which the oils are derived; and, as I know little of the subject myself, I will just place his statements against those of Mr. Piesse, on whose authority each of the controverted names was given.

Oil of calamus is distilled, not from *Calamus aromaticus*, but from the rhizome of *Acorus Calamus*.

Indian geranium oil is yielded by *Andropogon Pachnodes*.

The wild thyme of our heaths, *Thymus Serpyllum*, gives an essential oil, but the oil of thyme of commerce is from *Thymus vulgaris*.

During the past spring I was furnished by Mr. Piesse with specimens of some rare essential oils, not previously examined—those of citron, lign aloes, pimento, and vitivert.

The following were the determinations of the specific gravity and refraction of these oils as they came into my hands:—

Crude Oils.	Specific Gravity.	Temp. Cent.	Refractive Indices.		
			A.	D.	H.
Citron . . .	0·8914	10°	1·4729	1·4797	1·5011?
Lign Aloes .	0·8702	18°	1·4620	1·4679	
Pimento . .	1·0374	10°	1·5229	1·5325	1·5660?
Vitivert . .	1·0070	19·5°	1·5147	1·5218	

Citron.—This oil was obtained from the leaves of the lemon, *Citrus Limonum*. It was slightly yellow. It began to boil at 155° C., but the bulk consisted of a liquid having the boiling-point 166°–168°; the specific gravity 0·8549 at 19·5°; the refractive index for A, 1·4680; and the dispersion 0·273. Its odour resembled that of lemon, and it was probably identical with the hydrocarbon found in other parts of the same plant.

Lign Aloes.—This is a colourless oil, with a characteristic pleasant odour, believed to be obtained from the wood of a large tree that grows in Mexico.† The principal part distils over at somewhere about 200°; but it seemed impossible by fractional distillation, even with the aid of sodium, to obtain a body of a fixed boiling-point. The specific gravity and optical properties of the best rectified oil are given later on in this paper; they will be found to resemble closely the properties of citronellole, suggesting the idea that the principal constituent may also have the composition $C_{10}H_{16}O$.

Pimentò.—This pungent oil is derived from the seeds of *Myrtus Pimenta*. It began to boil at about 197°, and the thermometer rose gradually to 242°, about which temperature the greater portion passed into the receiver. The first portion consists partly of an oil insoluble in potash; the second is wholly dissolved by an alkali. When rectified, though perhaps not quite pure, it was found to have the boiling-point 243°; specific gravity at 12·5°, 1·0436; refractive index for A 1·5281; and dispersion about 0·416. Its odour was that of eugenic acid, and like that body it was freely soluble in potash, giving two salts, of which that which contains the larger proportion of acid will separate from a moderately strong solution in crystalline masses. As the physical properties mentioned above accord sufficiently well with those previously determined for eugenic acid,* there can scarcely be a doubt that oil of pimento is substantially the same as oil of cloves, while each contains a small proportion of a hydrocarbon, to which is due the difference of their odours.†

Vitivert.—The crude oil was very viscid, of a dark brown colour, with an odour suggesting both sandal-wood and patchouli. On repeated distillations it was found to consist mainly of a liquid boiling at 280°–283°, but the action of sodium showed that this was a mixture of two bodies, the one decomposable and the other unalterable by that metal. The rectified oils were of a brownish-green colour on being freshly distilled, and changed to a truer green shortly afterwards—a circumstance which I have not observed in any other case. An examination of the hydrocarbon is given below, and confirms the close resemblance of this oil to those of cedar and sandal wood.

THE HYDROCARBONS.

These are all of the composition $C_{10}H_{16}$, or a multiple of that. In the previous paper I described several new ones, of which I analysed eight. No names were given them beyond that of the oil from which they were obtained, but now, in accordance with the usual practice, I would suggest the following:—

Hydrocarbon	from	Bay	Laurylene.
,,	,,	Calamus	Calamene.
,,	,,	Dill	Anethene.
,,	,,	Elder	Sambucene.
,,	,,	*Eucalyptus amygdalina*	Eucalyptene.
,,	,,	Myrtle	Myrtene.
,,	,,	Nutmeg	Myristicene.
,,	,,	Rosewood	Rhodiene.

Polymeric Groups.

When treating of the hydrocarbons of the essential oils in my previous paper, I distinguished between three polymeric groups, to which were assigned the formulæ $C_{10}H_{16}$, $C_{15}H_{24}$, and $C_{20}H_{32}$. The first group were said to comprise the great mass of these hydrocarbons—turpentine, orange, caraway, nutmeg, anise, thyme, myrtle, and twenty others; the second, those derived from cloves, rosewood, cubebs, calamus, cascarilla and patchouli; while the third group was represented by colophene.

That colophene also has its isomerides is rendered probable by the descriptions given of paracajputene, and of the substances from other sources which have been named colophene, but which are probably not identical with it.

If there is this distinction, the vapour-densities of members of the three groups should be different. Now the densities of oil of turpentine, pepper, juniper, elemi, lemon and orange, together with gaultherylene, valerene, citrene, terebene, carvene and caoutchene had been determined by various experimenters to be about, though generally a little above, the theoretical density for $C_{10}H_{16}$, viz. 4·71. The experimental density of colophene given in Gmelin's Handbook exceeds what would be required by $C_{20}H_{32}$. No member of the second group, however, had been examined in this respect, unless it be cedrene, which appears to belong to it, and which gave, according to Walter, the vapour density 7·5. $C_{15}H_{24}$ requires 7·06. I took the oils of patchouli and calamus.

* Read before the Chemical Society, Dec. 7, 1871 (*Journ. Chem. Soc.* [2] x. i.).

† The Lign aloes of the sacred Scriptures is supposed to be the *Aquilaria Agallochum* of Northern India.

* Phil. Trans. 1863, p. 317.

† Since writing the above, I find the same conclusion had been previously arrived at by Oeser.

	Calamene.	Patchouli.
Difference between weight of air and vapour . . .	·3327 grm.	·311 grm.
Temperature of balance case .	12·5° C.	9° C.
Temperature of sealing . .	280° C.	294° C.
Capacity of globe	110·8 c.c.	98·49 c.c.
Residual air	2·6 c.c.	1·95 c.c.
Calculated density of vapour .	6·80	7·2

Each of these differs little from the theoretical 7·06, and they differ in opposite directions.

It is well known that several oils of the first group form compounds with hydrochloric acid of the composition $C_{10}H_{16}.2HCl$. It might, therefore, be anticipated that the oils of the second group would combine with a smaller quantity of hydrochloric acid; and, indeed, the hydrochloride of cubebene is said to be $C_{15}H_{24}.2HCl$. I tried patchouli and rhodiene. Dry hydrochloric acid gas was passed through the oil till it was perfectly saturated; in each case it remained liquid; portions were freed from excess of acid by exposure in vacuo over sticks of potash, or by heating in a water-bath and analysed. Two different preparations from patchouli gave 7·11 and 11·18 per cent. of chlorine; the product from rhodiene purified in the two ways mentioned above gave 18·26 and 16·78 per cent. These numbers differ from one another, and from those deduced from any probable formula. They seem to indicate that these liquid hydrochlorides are somewhat indefinite.

(*To be continued.*)

A BLUE COLOURING MATTER IN THE BILE.

BY E. RITTER.*

Städeler and Jaffé have shown that a blue colouring matter can be obtained by the action of nitric acid on the biliary pigments. Ritter describes a blue colouring matter, which he regards as a constituent of the bile, and not as a product of chemical action. He finds it in the bile of man, the ox, the sheep, the pig, the dog and the cat. It is prepared as follows:—

Bile is shaken with chloroform till a yellow solution is obtained, and the yellow chloroform solution is treated with soda till the colour entirely disappears. On neutralization with hydrochloric acid two layers are formed, one of which contains the yellow chloroform solution, the other the blue colouring matter in a state of suspension. The colouring matter is insoluble in chloroform and acids. It dissolves in alkalies, forming a colourless or yellowish solution. When this solution is neutralized with acids and exposed to the air, a brown precipitate forms, which after a few days, but sometimes only after a month, again becomes blue. Reduced indigo, on the other hand, dissolved in alkalies, becomes instantaneously blue on exposure to the air.

* N. Repert. Pharm. xx. 569, and Journ. Chem. Society.

YORK CHEMISTS' ASSOCIATION.

The Annual Dinner of the York Chemists' Association took place at the King's Arms Hotel, Fossgate, on Thursday evening, the 8th of February.

The President of the Association, Mr. Geo. Dennis, took the chair, and Mr. Councillor Cooper the vice-chair.

The usual loyal and other toasts were proposed, and a most enjoyable evening was spent.

GLASGOW CHEMISTS AND DRUGGISTS' ASSOCIATION.—ANNUAL FESTIVAL.

The Annual Festival of this Association was held on Wednesday evening, 14th inst., in the Royal Restaurant, West-Nile Street. Upwards of eighty gentlemen sat down to supper. The chair was occupied by Mr. Hugh Hart; Messrs. James M'Donald and Thomas Davison acting as croupiers. There were also present Drs. P. A. Simpson, Hugh Miller, D. C. Black, A. M. Robertson and R. C. Moffat, and Messrs. E. C. C. Stanford (Edinbarnet), William Tate and James Mackenzie (Edinburgh), Charles Kerr (Dundee), Frazer, Kinninmont, Jaap, D. B. Kerr, William Whyte, R. T. Dun, William Kennedy, James White, etc. etc.

After supper the Secretary, Mr. J. M. Fairlie, stated that he had received several letters of apology from gentlemen in and around Glasgow, including Messrs. Mackay, Baildon, Buchanan and Blanchard (Edinburgh), Alexander (Greenock), Dr. Thorpe (Glasgow), etc.

The usual loyal and patriotic toasts were then given from the chair and duly responded to, the Volunteers being acknowledged by Captain Steuard. Mr. M'Donald afterwards proposed "The Medical Profession," coupled with the name of Dr. Simpson, who, in acknowledging the toast, referred to the close tie which bound the two professions of physician and pharmaceutist together; and expressed his conviction that, although so closely connected, it was absolutely necessary that they should be carried on by different individuals. He considered it a high compliment they had done him in connecting his name with this toast, and concluded an able speech by making some felicitous remarks regarding toasts in general, and the need the medical profession had of all the good health they could wish them.

The Chairman then proposed the toast of the evening, "Success to the Glasgow Chemists and Druggists' Association." He alluded to the past history of the Society, to its struggles for early closing, and its efforts for the advancement of the education of the chemist and druggist; and pointed out that whether it was viewed as an educational institution or as a mutual improvement society, it was worthy the support and countenance of every person in and around the city connected with pharmacy. The toast was coupled with the names of the President and Secretary of the Association.

Mr. Davison (President) spoke of the action taken by the Association in the earlier stages of the poisons regulation question, and said he believed that action did much to instigate, if not to encourage, the action of other societies throughout the country. He said the syllabus issued this session, including as it did the names of Mr. Stanford and Dr. Simpson, both of whom had delivered such excellent addresses, would bear favourable comparison to that of any Society in the kingdom.

Mr. Fairlie (Secretary) referred to the future prospects of the Society, and hoped that the offer and suggestion made by their excellent councillor Mr. Frazer, viz. a donation of £5 to establish a library and museum, would be kept in view until it was an established fact. He mentioned that many, after they had passed their examinations, or got established in business for themselves, took but little interest in the Society. He thought this should not be, that it was to the interest of every one to uphold such an association, and that all should consider it their duty to give it a helping hand.

The other toasts were, "The Pharmaceutical Society and Council," proposed by Dr. Black and acknowledged by Mr. Frazer; "The Pharmaceutical Conference and Chemical Science," proposed by Dr. Robertson and acknowledged by Mr. Stanford; "The Strangers," proposed by Mr. Kinninmont and acknowledged by Messrs. Tait and Mackenzie (Edinburgh); "The Chairman," proposed by Mr. Jaap; and "The Croupiers," by Dr. Miller.

Mr. M'Donald, in acknowledging the latter toast, regretted the long hours that still existed in many establishments, and stated that he was authorized by the Company which he represented (The Glasgow Apothecaries' Company) to state that if the project referred to by the Society, viz. that of establishing a library and museum, was gone into with spirit, they would give an annual donation of £5 to help to keep it up.

At intervals during the evening several songs and recitations were given, and the company broke up at an early hour.

The Pharmaceutical Journal.

SATURDAY, FEBRUARY 24, 1872.

Communications for this Journal, and books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

PHARMACEUTICAL APPRENTICES.

THE case reported at p. 695 of this Journal illustrates the evils attending a practice that still obtains to some extent amongst pharmaceutists, but which is as pernicious in its effects as that of taking apprentices who have not proved their fitness by passing the Preliminary examination. At no time, and in no business, would it be fair for an employer to ignore the fact that the relations between himself and his apprentice are such that, while he may justly expect from the apprentice good and faithful service, the service to which he is entitled is rather of the nature of skilled labour, than the mere drudgery of a porter or errand-boy's work.

With the pharmaceutist, however, this is more emphatically the case. The calling for which he has—usually in consideration of a premium paid—engaged to train and qualify his apprentice is one requiring something more than the mere manipulative skill which suffices in many businesses. The teaching of a knowledge of shop details should, therefore, be accompanied, step by step, by opportunities for acquiring that scientific information without which no pharmaceutical apprentice now, more than ever, can look forward to a prosperous career.

We have no desire to say anything that would tend to foster a carping, critical and dissatisfied feeling among apprentices; such a course would be eminently injudicious. But to ignore the fact that such a feeling sometimes exists—and that not without cause—would be equally so. Doubtless there is much work that has to be done in druggists' shops especially in country districts, that would not do much, except in an indirect manner, towards fitting the future pharmaceutist for his special labours, and yet it is such as the employer might fairly expect to be cheerfully performed by him. But the just claims of the apprentice should never be so lost sight of in the need for grinding paints, making up horse balls, cleaning windows, opening shop, etc., as to allow it to be forgotten that the law now prescribes that a test should be passed before the youth will be allowed to conduct a business of his own; and few employers, we think, will regret gaining the apprentice's confidence, by letting him see that he is being so taught his business as to secure the passing of the Minor examination at least.

There is reason to believe, however, that frequently apprentices are taken unaccompanied by the premiums that are necessary to remunerate the pharmacist for the special skill and care required for such training as we have referred to. But such a practice is unwise, especially now that pharmaceutists are claiming—and successfully claiming—to be looked upon by the public as a different class to ordinary tradesmen, and it is scarcely politic to allow it to be thought that even the junior branches are unentitled to similar consideration.

CINCHONA AND IPECACUANHA IN INDIA.

IN the discussion which followed the reading of Mr. COLLINS's paper on "Economic Botany" before the Society of Arts last week, Dr. BRANDIS, Inspector-General of Forests to the Government of India, said that the cinchona plantations were now become almost forests. Before long they would be able to be coppiced every six or eight years, just as oak coppices were treated in Germany, Scotland and elsewhere every fifteenth or eighteenth year, and this would probably be the simplest and most profitable mode of getting the bark. The introduction of ipecacuanha into India was also alluded to. Dr. MASTERS expressed an opinion that there must be dozens, if not scores of plants indigenous to that country, having the same medical properties as ipecacuanha, which could be much more easily utilized.

MEDICAL STUDENTS AND MATERIA MEDICA.

PROFESSOR HUXLEY's views with regard to medical men studying materia medica* were referred to on Wednesday week at the meeting of the Society of Arts by the Chairman, Dr. MAXWELL T. MASTERS, F.R.S. That gentleman said that, though a great admirer of Mr. HUXLEY in most things, he thought he was wrong on this point. That a medical man should not have some knowledge of his tools seemed absurd; and with regard to steel, he might say as an illustration, that he had known one of the most eminent surgeons of the day (Sir WILLIAM FERGUSSON) to examine a knife in the operating theatre, and not being satisfied with its quality, break it before the maker's eyes, as a warning that inferior quality would not pass muster. He thought it to be of essential importance that a medical man should be able to distinguish between certain white powders, such as calomel and antimonial powder and white arsenic, or between sulphate of zinc, oxalic acid and sulphate of magnesia.

THE KING OF BAVARIA has conferred on Dr. L. A. BUCHNER, Professor of Pharmacy at the University of Munich, the cross of the first class of the royal order of merit of St. Michael.

* See Vol. I. p. 8.

Transactions of the Pharmaceutical Society.

EXAMINATION IN LONDON.

February 16th, 1872.

Present—Messrs. Allchin, Barnes, Bird, Carteighe, Cracknell, Davenport, Edwards, Gale, Garle, Haselden, Ince, Linford and Southall.

Dr. Greenhow was also present on behalf of the Privy Council.

MODIFIED EXAMINATION.

Thirty-seven candidates were examined; of these, *eleven* failed. The following *twenty-six* passed, and were declared duly qualified to be registered as

CHEMISTS AND DRUGGISTS.

Backhouse, Headley Noah	Paris.
Bush, William	Skipton.
Clayton, Daniel Thomas	Boston.
Clayton, George Pearson	Huddersfield.
Clifton, John Moore	Lincoln.
Cooper, Thomas Rayner	York.
Crookes, Joseph	Bradford, Yorks.
Faccy, John	Ledbury.
Freeman, Frederick	London.
Harrop, William Hutchinson	Rochdale.
Higgins, William	London.
Jones, Frederic	London.
Longley, Charles	London.
Mason, Thomas Searby	Wolverhampton.
Moore, John Shipp	Stratford-on-Avon.
Ozanne, Albert Angel	London.
Parkin, Charles	Stockton-on-Tees.
Pearson, Edward	Islington.
Probyn, Clifford	Kennington.
Rawson, Frederick George	Lincoln.
Spalding, William Richard	Hull.
Taylor, Charles William	Brighton.
Thomson, William	London.
Vickerman, Edwin	Huddersfield.
Walker, Samuel Charles	Ipswich.
Wheeler, Joseph	London.

PRELIMINARY EXAMINATION.

The undermentioned certificates were received in lieu of this Examination:—

Certificate of the University of London.

Griffith, Richard W. Smith	Southampton.

Certificates of the University of Cambridge.

Chaston, Ernest Robert D.	Lowestoft.
Harrington, John Frederic	Rochdale.

Certificate of the University of Durham.

Wordsworth, George	York.

Certificate of the Committee of Council on Education.

Patchett, Isaac	Birstal.

Certificates of the College of Preceptors.

Jones, Henry Stevens	London.
Tisdall, Charles Jerome	Holt, nr. Wrexham.

Provincial Transactions.

THE NORTHAMPTON CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

A special Meeting of the above Association was held on Wednesday, February 14, to give the members an opportunity of meeting Professor Attfield, who happened to be present in the town, and had kindly accepted an invitation to attend. After a few words of introduction from the President (Mr. Masters), the Secretary (Mr. Druce) mentioned some details relating to the Society. He said that there were sixteen employers and twenty-five assistants and apprentices engaged in pharmacy in Northampton; of these twenty-five, twenty were members of the Association, the average attendance being ten.

Professor Attfield, after expressing his sympathy with the objects of the Association, proceeded to give a few hints as to the method by which they might be attained, and such knowledge acquired by the members as would enable them to pass the examinations of the Pharmaceutical Society.

With regard to the Preliminary examination, Professor Attfield expressed a hope that it had been passed by all present. He said that it presented no real difficulties, and should be passed before commencing an apprenticeship. Many candidates were rejected, but such ought to be the case if they insufficiently prepared themselves.

As the Minor examination had to be passed by every person wishing to be a chemist, it became more specially the business of such associations to facilitate the acquirement of the necessary information. The reading and translating of prescriptions would present no difficulty to those who had passed the Preliminary and had acquired the practical knowledge to be obtained in the shop. In practical dispensing neatness was very desirable. The ability to detect unusual doses required by the examiners was such as could be obtained by an acquaintance with the doses given in the Pharmacopœia. Dispensing must be studied practically; the information acquired from books or in a school of pharmacy could never obviate the necessity of going behind the counter.

Under the head of "Pharmacy" was included the recognition of the several preparations of the Pharmacopœia which were not of a definite chemical nature, such as extracts, tinctures, simple and compound powders, etc. Much of this information might be acquired by carefully noticing the differences in the substances met with in the ordinary business of the shop. A considerable knowledge of materia medica also could easily be obtained in the same way, while the information which had to be sought elsewhere, such as the botanical, zoological and geographical sources of the different articles, would be of great service to the student in fitting him for the position he aspired to occupy.

Botany should be learned practically: the student should go into the fields and gather plants and flowers for himself. The use of a microscope would greatly increase the interest of structural botany—the drier portion of this subject.

In the study of chemistry the descriptions of the processes by which certain compounds were produced were sometimes learned by the student by rote. But by far the better plan was to make a small quantity of the different salts, such as iodide of potassium, of which five grains could be prepared more easily than five ounces, so that no great expenditure for chemicals or apparatus was necessary. The student would be required to know the composition of such salts as soda tartarata and to be able to write their formulæ, and care must be taken by learners not to confound pharmaceutical with chemical formulæ. The decompositions occurring in the production of such salts would also have to be explained by diagrams or written equations.

Professor Attfield congratulated the Association on the manner in which they conducted their classes, and could only suggest that they should add practical chemical analysis to the other subjects. By the expenditure of a few shillings per head for apparatus and reagents, they could carry on analysis, and perhaps a little synthesis, in their class-room, which was in every way fitted for the purpose, and so be able to detect adulterations, impurities, and faults of manufacture in the many articles which came before them in pharmacy. Such knowledge would also, indirectly, help them for the Minor examination, improve their reasoning powers, make them better men of business and more useful members of society.

At the conclusion of the address a hearty vote of thanks to Professor Attfield was passed by those present.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

At the Meeting of this Society, on Thursday, February 15th, Dr. Frankland, F.R.S., President, in the chair, after the ordinary business of the Society had been transacted, Professor Roscoe, F.R.S., gave an account of some of his recent researches on the element tungsten, under the title "On the Study of some Tungsten Compounds." The author, after giving a short *résumé* of the labours of other chemists on those compounds of tungsten which he had been investigating, proceeded to describe their properties, and the methods of preparation he had employed to obtain them. As the result of his labours, he has definitely settled that the metal tungsten is a hexad element with the atomic weight 184, and has also shown the cause of the error of the French chemist, Persoz, who assigned 153 as the atomic weight. A collection of very fine specimens of tungsten compounds was exhibited by the Professor.

SOCIÉTÉ DE PHARMACIE DE PARIS.

At the Meeting of this Society on Wednesday, December 6th, a letter from M. Lecanu was read, announcing that at the unanimous request of the pharmaciens of Oloron (Basses-Pyrénées) the municipal council of that town had decided that the Rue de la Bonneterie, in which street Labarraque was born, should be called after that distinguished pharmaceutist.

The Society proceeded to the choice of officers for 1872, when M. Grassi was elected Vice-President and M. Bourgoin was elected Secretary.

M. Baudrimont presented a specimen of cinchona bark grown in the East Indies and recently met with in commerce, from which he had obtained 37½ per cent. of extract and 54·5 grams of alkaloidal sulphate per kilogram of bark; of this quantity 10 grams consisted of sulphate of quinine, the remainder being sulphate of quinidine and cinchonine. The appearance of this cinchona was very different from that imported from America.

M. Marais said that he had received from England some specimens of young barks that were very rich in alkaloids, and he thought that the practice in France, of preferring thick and aged barks, was wrong. The specimen exhibited by M. Baudrimont had the characteristics of a young bark, to which circumstance might be attributed the favourable results obtained.

M. Soubeiran alluded to the terrible fire at Chicago, and expressed a wish that the efforts now being put forth by pharmaceutists in Great Britain to replace the losses of the Chicago College of Pharmacy might be imitated by the members of that Society.

M. Guichard read a paper on "Soluble Oxide of Iron." He had found that when perchloride of iron was precipitated by caustic soda, in the presence of sugar, an insoluble precipitate is obtained which forms a gelatinous mass, if only sufficient soda be added to saturate the ferric chloride; but this precipitate is entirely dissolved if an excess of soda be added in the proportion of one equivalent for two of sesquioxide of iron existing in the mixture. The compound in which the oxide of iron is dissolved is not a saccharate of iron, but a combination of soda, oxide of iron and sugar. He had also found that other substances, such as glycerine and mannite, formed similar compounds, in which they took the place of the sugar, and that other metals would form with these substances and sugar compounds similar to those obtained with iron.

M. Buignet remarked that M. Roussin had noticed and studied the gelatinous precipitate which perchloride of iron gave with a solution of gum, and asked whether gum would not undergo similar reactions with the iron salts to those noticed in the various substances mentioned.

M. Guichard replied that, as gum yielded this gelatinous precipitate with the perchloride of iron alone, he had not thought it necessary to examine whether it comported itself in the presence of the salts of iron and soda in the same manner as sugar and glycerine.

M. Jeannel observed that the gelatinous precipitate produced by perchloride of iron in a solution of gum was redissolved by an excess of that salt, and that the same thing occurred with albumen.

SOCIETY OF ARTS.

The Study of Economic Botany, and its Claims Educationally and Commercially Considered.*

BY JAMES COLLINS, F.B.S. EDIN.

Curator of the Pharmaceutical Society's Museum.

The subject of economic botany is one of very great importance. Its practical utility, forming as it does no mean portion of the very groundwork and foundation of commerce and manufactures, and, therefore, of national prosperity, apart from the many interesting features which appertain to its study, is sufficient excuse for my bringing it before your notice this evening. The subject, too, is of such large extent, and its different points so varied, each seeming to demand a separate hearing, that I feel compelled to throw myself on your kind indulgence —an indulgence which, I am fully aware, you are ever ready to show. It is not my intention this evening to dilate on the importance of economic botany, which must be evident to all present, but rather, taking for granted that its importance will be conceded, to dwell on the necessity which exists for a more widely disseminated knowledge of it. If we look around us, we cannot help acknowledging how, for our food, our clothing, our very existence, we are dependent on the vegetable kingdom. Without it, man could not exist, and before the earth was fit for his abode, an All-wise Creator made the "earth bring forth grass, the herb yielding seed, and the tree yielding fruit after his kind;" and from the period when man received his first lesson in economic botany, "Behold, I have given you every herb bearing seed, which is upon the face of all the earth; and every tree in which is the fruit of a tree yielding seed, to you it shall be meat,"—this dependence has continued. In fact, to attempt to dwell on our dependence on the vegetable kingdom would be dealing with the veriest truisms, and would be a task even more hopeless than that essayed by the quaint Bernard Palissy, in attempting to describe our dependence on wood, a task which he gave up in despair, saying, "I have divers times thought to set down the arts which shall perish when there shall be no more wood, but when I had written down a great number, I did perceive that there could be no end to my writing, and having diligently considered it, I found that there was not any which could be followed without wood. . . . And truly I could well allege to thee a thousand reasons, but it is so cheap a philosophy that the very chamber wenches, if they do but think, may see that without wood it is not possible to exercise any manner of human art or cunning."

The science of botany embraces every fact which has reference to plants, either living or dead. For convenience of study, it is subdivided into several departments, each of which is so large as to require from the student undivided attention and great concentration of energy before he can become thoroughly conversant with it. We may, for our present purpose, thus classify them. First, we have organological, or structural botany, which treats of the internal and external structure of the various parts or organs of a plant, without reference to its life; second, physiological botany, which treats of the life of a plant and the functions of its various organs; third, systematic botany, which treats of the relations

* Read on Wednesday Evening, Feb. 14.

of plants to each other, and their arrangement or classification according to affinity; fourth, palæontological, or fossil botany, or the distribution of plants in time; fifth, geographical botany, or the distribution of plants in space; and last, though not least, economic or applied botany, or the use of plants and their application to the economy of life. This latter may be subdivided into (A) that which interests itself in living plants, viz. 1, agricultural, or field culture; 2, horticultural, or garden culture; and 3, arboricultural, or tree or forest culture: and (B) of the utilization of plants in 1, food: 2, medicine; and 3, manufactures. It is to the latter subdivision we shall principally confine our remarks. First, then, I refer to its educational aspects.

The study of economic botany, or, at least, the medical portion of it, enters as a part, and a very necessary part, into the curriculum of medical and pharmaceutical students, especially of the latter. I have used the words "very necessary," advisedly, as I may be reminded of the opinion of an eminent professor, one who is deservedly looked up to as an authority in all that pertains to natural history, as to the value of a knowledge of *materia medica* to medical students. He has expressed himself that such knowledge is as much good to medical students as "making them belong to the Iron and Steel Institute and learn something about cutlery because they use knives." But I venture to think that the comparison does not hold good. A student knows that it is steel he is using, and does not need to be taught the difference between such a substance and, say, a linen bandage, neither is he likely ever to mistake the one for the other. A medical man depends largely for his medicines upon the pharmacist, by whom they are prepared with a greater amount of skill than he could bring to bear; yet, apart from all considerations of a liberal professional training, it is highly necessary that he should know something of the history of the drugs which he administers; for instance, he should know the difference between cusparia and nux vomica barks, or between horseradish and aconite roots, and be able to discern between the true and the false, the pure and the adulterated; moreover, he should be prepared to act for himself in the absence of assistance from a pharmacist. If such very necessary knowledge were, as a rule, wanting—which, happily, is far from being the case—at least one part of the French wit's definition of a medical man, as one who pours medicine, of which he knows little, into a system of which he knows less, would certainly be correct. And we may here remark that by far the largest, most valuable, and accurate portion of our knowledge of economic botany is due to the labours of those whose professions have required some acquaintance with the subject, the pursuit being of such interest that the acquirement of even a modicum of knowledge, for purposes of examination, proves an incentive to its further study.

The teaching of economic botany in schools I look upon as of the highest importance. The object of teaching is to supply knowledge that shall enable the recipient to take his or her place in the world's great workshop with credit and success; to fit for the counting-house, the market, the shop, or the home, either in this country or abroad. It is a well-recognized fact that it is not sufficient to teach the "three R's," but that it is necessary also to call forth and train the thinking powers, and develope the faculty of observation. "Sight," it has been truly observed, "is a faculty, seeing an art." Like a mirror, the eye reflects an object, but unless some knowledge or conception of the object be possessed, like a mirror, it, too, is insensible, for "death lives where power lives unused."

> "In the material eye, you think, sight lodged.
> The eye is but an organ. Seeing streameth
> From the soul's inmost depths. The fine perceptive
> Nerve springeth from the brain's mysterious workshop."

Often is the phrase, the "dull routine of commercial life" used, and truly it is so, if the various substances which pass under notice have their only meaning in pounds, shillings and pence. But how different is the case if the worker knows something of the source, the history, and the associations of these same substances! How different is the interest shown in the carrying out of the daily duty, and how much more valuable does such service become! On the Continent, trade education is well looked to by the respective governments, and books are published with the specific object of enlightening the future merchant or artisan on the characters and properties of the substances which he will have to trade in or manipulate, for it is well understood that the well-being of a country at large is affected for better or for worse as the rate of diffusion of such knowledge is greater or less. As Dr. Yeats justly observes, in his preface to the 'Natural History of Commerce':—"The complaint is now general that this knowledge is less frequently met with amongst us than it should be, while our Continental neighbours are so sensible of its advantages that they are providing it liberally for every man, woman and child within their reach. They feel that it is in itself property, and the prolific source of wealth. They see that it cannot be carried off by an enemy, or paralysed by a panic. They find that it costs nothing to defend or to ensure; that it is not merely a circulating commodity yielding a single profit to its professor, but rather a fixed and constantly productive capital." And speaking of the technical schools of Leipzig, Antwerp, Berlin and Amsterdam, he says, "In them the future Dutch or German merchant is taught to look beyond the limits of the Zollverein, and to regard the world at large as a vast storehouse, with the contents of which he must make himself familiar. At school he studies the sources of supply for the goods he must hereafter deal in. A counting-house, he is told, is a place in which he will be expected to use his knowledge, and not to seek it. He is first made acquainted with the laws and conditions of soil and climate, and then brought into contact with specimens of produce from the different kingdoms of nature; these he is required to examine and describe methodically."

I am very glad to find that this Society, ever ready as it is to give its aid to the improvement of commerce, proposes holding examinations in the science and technology of the various arts and manufactures of this country. It is assuredly a step in the right direction, and cannot but prove highly beneficial. What interest will such school teaching impart to every-day life, and to the various products which meet the scholar's eye! Well do I remember when, as a pupil-teacher, I tried to teach my class geography, other than in the parrot-like manner of repeating the names of various places, by weaving the lessons into a narrative of voyage or travel, describing the people, their customs, the products of the country, and so forth. The experiments, though crude, thoroughly repaid the pains taken, as shown by the great amount of attention given and the progress made. And in this manner how much additional interest can be thrown into lessons in which products are mentioned, such as of

> "The various treasures of the Indian strand—
> The fragrant cinnamon, the glowing clove,
> And all the riches of the spicy grove;
> Of drugs of power the fever's rage to bound,
> And give soft languor to the gaping wound."

Even that dread implement of castigation, the fear of evil-doers, gets more respected when something is known of its history. In a dusty school-room in Hanover, some years ago, might have been seen a knot of boys, discussing how they might rid themselves of the "magisterial sceptre," meanwhile converting the hateful canes into a source of amusement, by cutting and smoking them as impromptu cigars. Thinking that the canes were a kind of willow, they made up their minds to find the source, and extirpate the baneful plant. Seeing a waggon-load passing through the town, they followed, and asked the owner their origin. But his answer dashed their fond project to the ground, for he told them that the canes were brought from the East Indies, and that the supply was unlimited. Encyclopædias confirmed the unwelcome news. Foremost amongst the boys, at least in the search for information, was one who, in later years, besides proving himself one of our best botanical explorers, wrote a history of this class of plants, of which Humboldt expressed a high opinion. I refer to Dr. Seemann,* who was our chairman when I had last the honour of addressing you.

Professor Wilson, speaking of the necessity of such knowledge being taught in schools, in order to the better fitting for the battle of life, says, "We go forth in hundreds every year to seek, as we say, our fortunes, as if the seeking was all on our side, and we should know Fortune if we saw her. And it may be, that all the while our fortune, like a lost bride, is seeking us; and too often, like Gabriel and Evangeline in Longfellow's sad story, we pass each other in the dark, and, all unconscious of the fact, bid farewell for ever.

"How many of our young men who visit foreign countries, bent on commercial enterprise, could tell whether the exudation from a tree was a gum, a sugar, a manna, a resin, a gum-resin, a camphor, a caoutchouc, or a gutta-percha; whether a particular tree would yield oil or not, or fibres suitable for fabrics, rope and paper; whether a wood was soft or hard, lasting or destructible?"

The result of such teaching is easy to anticipate. In the counting-house, in the market and in the workshop, at home and abroad, we should have intelligent workers, whose knowledge, besides engendering and strengthening a love for their calling, without which success is impossible, would be found in numberless ways to prove itself useful, and thus contribute in no slight degree to success, and raising up a band of observers who would be constantly on the watch for improving or extending our present supplies of raw material, and be capable of forming an approximate estimate of the value of the various substances coming for the first time under their notice.

It would be well, perhaps, just to indicate the meaning I wish to convey when I speak of teaching this subject in schools. I would not have it taught to the exclusion of other equally important subjects. The following is an example—which, in the carrying out, might be modified to suit the requirements of the case—of the manner in which such lessons could be given.

I would devote in each week two or three hours, more or less, according to the progress made in other subjects, to elementary lessons on the best known and most commonly used vegetable products. I would preface such a course by a few lessons on the various parts of plants and their structure, so that the scholar might know the relation of a product to the plant producing it. This should be copiously illustrated by specimens of common field plants, which the scholars would take pleasure in collecting, by specimens of vegetable products, and by the free use of the blackboard. The necessity for well and judiciously illustrating every lesson should not be lost sight of. This done, the vegetable products themselves should be dealt with in simple natural groups, such as substances used as food, fibres, dyes, and so forth. A strictly scientific grouping of the substances in Natural Orders must not be thought of for such a purpose, as the association and comparison of analogous substances would be lost sight of. As an exercise, and as a means of more thoroughly fixing the lesson in their mind, and also as giving the teacher an opportunity of correcting any wrong ideas, the scholars should be required to reproduce from memory the various facts brought before them.

But I am fully aware that there are two great difficulties in the way of the teacher in this matter, namely, the want of good text-books and of specimens to illustrate the lessons. The literature of economic botany, unfortunately, is of a very scattered character, information having to be looked for in odd and out of the way places. At the present time there is no good single book for teachers, nor one which could be put into the hands of scholars. On economic plants, especially those used in medicine, information of the highest and most trustworthy character may be found in Pereira's or Royle's 'Materia Medica.' Lindley's 'Flora Medica,' and the same author's 'Medical and Economic Botany,' contain botanical descriptions only. But all of these are too special, and contain descriptions of many substances which, though to the economic botanist of very high interest, yet are not required in a text-book for general use.

Dr. Yeats's 'Natural History of Commerce,' part of which is devoted to economic botany, is the most useful and best book we have for school and general purposes. None of these, however, come up to my idea of what such a text-book on economic botany should be. Still, in the books I have mentioned, and some few others, the teacher will find information sufficient to enable him to give excellent object lessons.

The procuring of specimens, however, is of much greater difficulty; yet, by a moderate amount of perseverance on the part of the teacher, it can be overcome. I am not acquainted with any published sets of specimens adapted for teaching purposes, and the teacher is thrown, to a great extent, on his own exertions in procuring them. It is extremely desirable that the teacher should be able to show his scholars the raw products which form the subjects of his lessons. But most, if not all, the specimens required by the teacher for elementary lessons are procurable from grocers, druggists and others, for a few pence each, and the scholars themselves would gladly contribute specimens for such a purpose. Such a collection, together with some articles manufactured from them, could be placed in a case or drawers, where they could be seen, and would greatly add to the interest of the school-room. This could all be carried out at a very little expense. The cost of the specimens themselves would be small, and they need not, except in the case of liquids, be kept in glass bottles, the primary cost of which, together with that of replacing frequent breakages, might be a serious consideration. Strong cardboard, or, better still, wooden trays or boxes, answer very well. If the expense be not objected to, a nest of small drawers, of about nine inches long, four inches wide and two inches deep, would prove admirable, and, if well made, would stand any amount of legitimate wear and tear. In the Pharmaceutical Society's Museum, there are specimens in such drawers, which allow of the students thoroughly examining them; the drawers have stood an enormous amount of wear and tear, and the arrangement is highly appreciated by the students. The specimens should be carefully labelled with the common and best known name, their use and their habitat specified, and, if thought fit, the scientific name also; but a scientific name on such a label should not be too prominent, and certainly should not be given to the exclusion of the common one. Scientific names are absolutely necessary in fixing specifically individual plants. The same combination of generic and specific names cannot be used for more than one species, while common names are very loosely applied; yet, as it requires almost an apprenticeship to fix scientific names in one's memory, it would be too great a burden for most scholars. Of course, this remark must not be taken as indicating a want of appreciation of scientific names; I am only considering the requirements of the elementary schools, and am anxious to remove every possible difficulty. Good coloured dia-

* Since writing the above remarks, the sorrowful news has been sent from Nicaragua that Dr. Seemann has died from the effects of a fever. Botany has thus lost one of her best workers, and economic botany one of her best advocates. And I would record my humble testimony to Dr. Seemann's love of science, genial good-fellowship, and gentlemanly qualities.

grams, with bold outlines of the most prominent plants, could be drawn by the teacher or scholars. Before long, I trust that cheap cabinets of specimens for teaching purposes will be purchasable at reasonable prices. After the passing of the Pharmacy Act of 1868, by which law every intending pharmacist is obliged to undergo examination, a great need of cheap portable collections of materia medica was felt. Two or three firms undertook to remove this difficulty, by making up sets of such specimens, and selling them at as low a price as possible. One of these firms, Messrs. Evans, Lescher and Evans, of Bartholomew Close, have very kindly, at my request, specially prepared two of their collections, modified somewhat for general use. These are lying on the table. The medicinal preparations are left out, and other substances could easily be added.

Happily for this country we have at Kew one of the finest and most complete museums of economic botany in Europe, which, it is not too much to say, is the object of unqualified admiration from all who are judges in these matters. We are indebted for it to the exertions of the late Sir William Hooker, and the present Dr. Hooker, C.B.; and if ever a society of economic botanists should be formed, no more appropriate name could be found for it than that of "The Hookerian Society." But this by the way. I mention the Kew Museum here simply to direct the attention of teachers to it, as one of the finest aids and supplements to their teaching. No better holiday as regards health and enjoyment, and no pleasanter way of communicating information than, if the distance is not too great, to take their scholars to Kew. It could even be held out as an inducement to general good behaviour and progress in the study I am advocating. The catalogue of the museum and gardens is full of information.

Unfortunately, from various causes, the fact that museums should be, and if rightly managed are, powerful instruments of education, is lost sight of. The teaching capabilities of good museums are very great, but these have, till recently, been looked upon as receptacles for curiosities. Frequently it has happened that, when a person has had anything which has been out of the common, or that he could better employ the space it occupied, he has sent it off to a museum, without any consideration as to its fitness. And thus museums have been looked upon almost in the light of a showman's collection, of which it may be said—

> "Monsters of all sorts here are seen,
> Strange things in nature, as they grew so,
> Some relics of the Sheba Queen,
> And fragments of the famed Bob Crusoe."

One of the very best speeches I have ever met with on the subject of the proper use of museums is one by Sir Bartle Frere, given at the opening of the Bombay Museum in 1862. I quote the following:—

"Let us remember this museum is designed to be no mere collection of rarities and curiosities, at which crowds may gaze in vacant and resultless astonishment; you have purposed that it shall be a great engine of education,—in the words which you have so aptly quoted from the great lawgiver of scientific research, a 'College of Inquiry,' as distinguished from a 'College of Reading.' Here, as in a microcosm, you will collect specimens of whatever in art or nature ministers to man's wants or occupies man's thoughts. The student will here read, not through the imperfect medium of language, but in the products themselves visibly placed before him, the history, so far as human eye can trace it, of each wondrous process and product of nature. He will here trace, step by step, how the intellect of man, in various ages and in various countries, has turned those processes and products to human use, and how art has striven to impart to the result of her labour somewhat of that Divine image of those more than human characteristics of beauty, variety, perfection, and adaptation, for which the rudest of mankind ever yearn, and which the most civilized never fully attain to."

Local museums, when properly conducted, are of great use, but no such museum is complete unless economic botany is fairly represented.

In concluding my remarks on the educational aspect of the question, I would say that not only should the subject be taught in our elementary schools, but also in all educational establishments, in our universities and colleges, and that greater facilities should be given, by series of lectures and other means, for the acquisition of some knowledge of this subject by the masses.

We next pass to the claims which economic botany has on the attention of the commercial world. At least half of our commerce consists in the gathering in and sending forth again raw and finished materials derived from the vegetable kingdom. The claims of economic botany, therefore, rest not only on the fact that a knowledge of these products would give additional interest to every-day life, but upon the other fact, that if a more systematic attention were paid to the subject, the result would be largely beneficial to commerce. There is, however, a great absence of information amongst those engaged in commerce, concerning the very products on which their fortunes are built. All who have ever had any experience in endeavouring to ascertain the history of any substance, know full well the difficulty. Let me not, however, omit here to do full justice to the willingness with which all possible information is given. I have never yet gone to any merchant or broker who has not evinced the utmost readiness to afford me every assistance in any inquiry. And yet the fact remains, and what I would endeavour to urge on the attention of all concerned is, that the possession of at least the rudiments of a knowledge of economic botany is as necessary and as valuable as that of any other branch of knowledge which is deemed at present essential; and that no one should enter, either as master or servant, into commercial life, where vegetable products form the articles of trade, without some knowledge of them, and the greater the amount the better.

There are many duties inseparable from the calling of a merchant besides that of making money, which is the mainspring and end of all commercial enterprise. The merchant has to gather from the ends of the earth the workable materials required for the sustentation of our arts and manufactures; also to send forth the finished products, for the preparation of which the most perfect mechanism and the highest scientific knowledge has been brought to bear. In this, whilst seeking his own ends, he has necessarily, and possibly unconsciously, acted as a great civilizer of the world. But he should not be content with receiving hap-hazard what others send—he should use his best endeavours to extend and improve existing sources of supply, and to open up new ones. The mainstay of commerce, and the existence and onward march of civilization, are bound up with the exchange of workable materials. The merchant procures from a country substances which are produced, either spontaneously or by cultivation, in quantities above and beyond that required for home consumption—which, but for their capability of utilization elsewhere, would be so much waste and useless material—and carries them to another country where a want of them exists. By this exchange, the superabundance in the one country is made to supply the scarcity in the other, and thus he acts as a great civilizing agent by promoting commercial intercourse. What a state of living death would the world be in if each country, within its own area, satisfied all the wants, natural or acquired, of its inhabitants! If, for instance, Captain Cook's statement that "if an inhabitant of the South Sea has planted ten breadfruit-trees during his life, he has fulfilled his duty to his family as completely as a farmer amongst us who has every year ploughed and sown, reaped and threshed; nay, he has not only provided bread for his own lifetime, but left his children a capital in the trees," was universally true.

In fact, in such a state of affairs commerce could not exist, for, as Cowper has beautifully put it:—

"The band of commerce was designed,
T'associate all branches of mankind;
And if a boundless plenty be the robe,
Trade is the golden girdle of the globe.
Wise to promote, whatever ends he means,
God opens fruitful nature's various scenes.
Each clime needs what other climes produce,
And offers something to the general use;
No land but listens to the common call,
And, in return, receives supplies from all.
This genial intercourse, and mutual aid,
Cheers what were else an universal shade."

(*To be continued.*)

Parliamentary and Law Proceedings.

HOUSE OF COMMONS.

Tuesday, Feb. 13th.

Adulteration of Food and Drugs.

Mr. Muntz obtained leave to bring in a Bill to amend the law for preventing the adulteration of food and drugs.

The Bill was brought in and read a first time the same evening and ordered to be printed. The second reading was fixed for Wednesday, March 6.

Friday, Feb. 16th.

The Law Relating to Juries.

The Attorney-General, in replying to a motion brought forward by Mr. Lopes, as to the necessity of amending the law relating to juries, said that he could not say when it would be possible to undertake such legislation, but the subject had engaged his attention for some years, and at the earliest possible moment he would bring in a Bill dealing with it.

Public Health Bill.

Mr. Stansfeld moved for leave to introduce a Bill to amend the laws relating to public health. In the course of his remarks he said that he did not propose to deal with the question of the adulteration of drugs. As to the adulteration of food, there were powers under the Nuisances Removal Act of dealing with unwholesome food, and he proposed to extend these powers specifically in certain directions to which he would not then allude. But he proposed to make the local sanitary authority the authority for acting under the Food Adulteration Act of 1860. He proposed also to call upon the local sanitary bodies to provide hospitals and all the appliances and medical attendance for the treatment of epidemics. He also intended to ask the House to give to the Local Government Boards, with respect to the country, the same power which the Poor Law Board possessed in the metropolis, of requiring the institution of poor-law dispensaries and the provision of drugs for the treatment of paupers.

The Obligation of Pharmacists to their Apprentices.

Stockton County Court, *February 12th.—Before* E. R. Turner, Esq., *Judge.*

Horner *v.* Pybus, *and* Pybus *v.* Horner.

These were cross-actions for breach of contract. In each case the sum of £50 was claimed as damages. Mr. Edwards appeared for Mr. Horner, and Mr. Fawcett for Mr. W. Pybus. In opening the first case Mr. Edwards said that his client was a pharmaceutical chemist in Stockton, and had brought this action against Mr. William Pybus, auctioneer, to recover damages for loss of services of his son, who had left his apprenticeship without leave. According to law it was open for Mr. Horner to renew the action against the father of the apprentice from time to time, but, with his Honour's permission, it had been agreed to take his judgment upon the matter as to the entire damage sustained, and then to cancel the indentures. Mr. Fawcett agreed to this course, but read a quotation to show that his client could not be made responsible more than once.

Thomas Parker Horner was then called and examined by Mr. Edwards. He said: I am the plaintiff in this case. I am thirty years of age. John Alfred Pybus, a son of the defendant, was bound to me by indenture to learn the business of a pharmaceutical chemist, from the 7th December, 1869, until 16th April, 1874. He went away on a fortnight's leave of absence in October last, and has never returned. [The indentures were produced and handed to his Honour.] We parted on the best of terms when he went away, and I gave him a work to read whilst he was away. So far as I was able, I have taught him the business. Latterly he was so far advanced, that he stood by me and assisted me to dispense prescriptions. The usual work of an apprentice to a pharmaceutical chemist for the first year or so, is to open and close the shutters, sweep the shop floor, clean the mortars and measures, dust the bottles, and do anything appertaining to the business. It is usual for the apprentice to run errands. This is perfectly understood when there is not an errand boy.

His Honour: I cannot see what that has to do with learning the business of a pharmaceutical chemist.

Mr. Edwards: In the cross-action it is alleged that the boy was not properly instructed and was sent to run errands. We are trying both actions at once, to save time.

His Honour: Both you and Mr. Fawcett have been apprenticed to some one, I believe. Did you consider sweeping the office any part of your duty.

Mr. Fawcett: I would see them far enough first, if I had ever been asked.

Mr. Edwards: This is a matter of custom.

His Honour: I cannot see why a boy should sweep the floor of a shop. I should say that was a breach of his contract. How old is the boy?

Mr. Fawcett: He is nineteen in April.

Mr. Horner (by Mr. Edwards): I taught the boy in the same way that I was taught myself. I swept the shop, cleaned the windows, etc. This is usual in a small establishment where there are not any porters kept. I should have taught the boy his business more and more. Apprentices are not of much use at first. Defendant's son had begun to be useful to me. Having gone through his initiation into the business, I looked for some reward for my services. I could not replace him, except perhaps by paying a young man £20 a year, and giving him board and lodging, which would cost perhaps £30 a year in addition. I estimate the total damage to me at £50 a year, for the remainder of the time he has to serve.

By Mr. Fawcett: He has been with me about two years. I calculate £50 a year for the unexpired two years and a half. Perhaps I may get another apprentice who will be of the same use to me as the defendant's son was. I have been in business four years. I have had three apprentices during that time. Mr. Brown, the first, was there when I went. He knew something of his business, and served four years with me. He was out of his time last December.

Mr. Fawcett: Can you tell me in what way a young man can learn to be a pharmaceutical chemist by sweeping the shop floor?

Witness: We have all to commence in that way. It is not exactly connected with the business; but he knew he would have it to do, nevertheless. I was apprenticed to Mr. Boats, of York, a pharmaceutical chemist, and I had it to do. Young Pybus was a sharp boy for my purpose, such as to attend to the retail business, to serve customers, make pills, horse balls, weigh up things for sale, and do everything connected with the business. Perhaps he had one day's work a week in the cellar. He was not obliged to be down there. He could have been upstairs if he did not like it.

By his Honour: Perhaps he was pounding saltpetre or rosin in the cellar.

Mr. Fawcett: Did you not keep him in the cellar two or three days a week, making grease or lubricating powder for machinery?

Witness: He was not obliged to be there. The second apprentice was named Simpson. He is dead. He did work in the cellar. I am not aware that it is said the working in the cellar killed him. Before young Pybus came to me I did keep an errand boy. When I got a second apprentice, there were very few errands to go. Pybus did the work of the errand boy until the time he absconded. Errand boy's work amounts to nothing. Pybus did occasionally drag a handcart about the streets, but it is only what other apprentices have to do.

Mr. Fawcett: Quite so, quite so.

Witness: Perhaps Pybus carried out and delivered two dozen bottles of soda-water in a fortnight. The rest goes out by carrier. Pybus did not drag the cart about the street more than once a month on the average. He did carry lubricating composition out three times, I believe. There was half a hundredweight each time. My cellar is, perhaps, three times as large as the table (four feet by ten feet). There is gas burning in the cellar.

Mr. Fawcett: How long have you kept your errand boys? Have you had one more than three days at once?

Witness: I have one now.

Mr. Fawcett: What wages do you pay him?

Witness: That has nothing to do with the case.

Mr. Fawcett: I must have it.

Witness: I am paying him four shillings a week. I do not find him food or lodging.

Mr. Fawcett: Do you suppose that it would teach a lad to be a pharmaceutical chemist by giving him a basin to catch water from a steam-engine?

Witness: Certainly not.

Mr. Fawcett: Did not Pybus have to do this constantly?

Witness: No; not once in two months; and then he need not have done it unless he felt inclined. He knew it was wanted, and did it voluntarily. I will not swear that I did not tell him to do it. He might have refused to do it, and the other apprentice would have done it without a word. Before he went away he had liberty to get and read any of my books. I have had fault to find with him. I have complained to his father of him not coming to the proper time. Two months before he went away, I saw his father in the Market Place. I told him I thought the boy was doing well. When he went away I lent him a book, and said that he was to make good use of it, as he would soon have to take the other apprentice's place.

Mr. Fawcett: Do you remember a particular occasion in September last, when Simpson was alive, when his eyes were much inflamed, and he complained that it was caused by being down in the cellar so much?

Witness: I don't remember that.

Mr. Fawcett: Do you remember telling Pybus that he would not be able to take Brown's place when he left, and that Pybus replied it was very likely, as he had not had any experience?

Witness: Never. I never told Pybus that I would get another apprentice over his head, and keep him at the same kind of work that he was doing. I have not frequently told him that he was good for nothing. I have not the slightest idea how many prescriptions he had made up in my shop. Dozens I should say. He has dispensed from the prescription book regularly. He was secretary of a Sunday-school. I persuaded him to give that up, and he ultimately did so.

Mr. Fawcett: Don't you know that he went away because you kept him as a simple drudge all the time, and that he could not stand it any longer?

Witness: I believe that he took a dislike to the business. I believe that he had some conversation with an aunt from Harrogate. I know that he was learning shorthand, and that his going away was prearranged. I have not seen him do any shorthand during the time he was attending to my business. I believe that Mr. Pybus, the father, did once complain to me about the way I was teaching his son. I should sell my "lubricator" wholesale if I could get any orders for it.

By Mr. Edwards: The reason I persuaded him to give up the secretaryship of the Sunday-school was for him to have more time to learn the business. Porter's work is done by some apprentices for half their apprenticeship.

By his Honour: I passed my examination as a pharmaceutical chemist six years ago.

His Honour: Which of the clauses of the agreement says that the lad must sweep the shop?

Witness: He never raised any objection to it, your Honour.

The Attorneys in the case then caused some laughter by a discussion between themselves as to the sweeping out of solicitors' offices.

His Honour: Was it the Preliminary examination which you passed?

Witness: Yes, your Honour.

His Honour: How far did you go in mathematics?

Witness (evasively): It is not a very heavy examination.

His Honour: How far did you go? Answer my question.

Witness: Well; I did not get into mathematics at all, your Honour.

His Honour here said that the only clause about which he had any doubt was, that with reference to a "faithful" apprentice,—whether it included sweeping the shop, etc., or simply behave himself properly to his master's family and marry his daughter.

William Salmon, druggist, of Stockton, was then called for the plaintiff. He stated that he was thirty-two years of age, had served an apprenticeship at Darlington, had not passed a pharmaceutical examination, but considered the duties of an apprentice to be such as were defined by the plaintiff.

Mr. Fawcett, in replying upon the case, said that in the action brought by Mr. Pybus against Mr. Horner, for breach of contract, the boy had certainly gone away, but under the circumstances, if a verdict was given at all, it would only be for nominal damages. Taking Mr. Horner's evidence, where he tried to make it out that he was doing his duty to the apprentice by treating him as an errand boy,—he felt bold enough to say that Mr. Horner was not doing his duty to him, and, moreover, was preventing the youth having opportunities of acquiring an insight into the business he was sent to learn. Mr. Horner said that the boy was a good boy, who did everything he was told to do, and yet he suddenly went away without any reason. No one would believe that the boy went without a reason, and he proposed calling him to state that he was employed nearly the whole of the time as a mere drudge; and that he was often down in the cellar pounding away at one nauseous mixture or another. Mr. Horner tried to blow hot and cold with the same breath. He said the lad was fit for anything and a great loss to him; but when they came to the point of instruction, he was compelled to ask what he had taught him. Mr. Horner denied that he had told him he would keep him at this sort of work, which was the reason he went away, but the lad would contradict him still further, and say he had not made up more than half-a-dozen prescriptions under his superintendence. Whatever the lad learned of his business was what he had read at home after business hours, and there were no thanks due to Mr. Horner for that. He had neglected his duty most disgracefully and shamefully, and instead of his bringing this action, he (Mr. Fawcett) contended that his client had good grounds for the action he brought for neglect. He would call two witnesses:—

John Alfred Pybus (by Mr. Fawcett) said: I am the apprentice under this indenture to Mr. Horner. I have perhaps made up a dozen prescriptions whilst I have been with him. I was generally in the cellar pounding soda for the lubricating compound. It is for machinery, and not sold over the counter of the shop. It does not require any knowledge of pharmacy. Taking it week by week, I was about three days a week in the cellar, from nine o'clock in the morning until seven o'clock at night, during the whole time I have been there. On other days I have gone to Mr. Mandall's to catch condensed water and bring it to Mr. Horner's. I had to do that one or two days in a week. I used to make a good many horse balls. I have made pills in the cellar for sale in the shop. I don't object to that. Mr. Horner showed me how to make up prescriptions about six times. I cleaned the windows, swept the shop, drew the handcart about the streets and I have been as far as Wynyard and Middlesborough with parcels. Mr. Horner has told me that I was a lazy fool. I went away because I was miserable; because of the names I was called and the work I had to do, which was not calculated to improve my knowledge of pharmacy. Before I went away I had some conversation in the cellar with Mr. Horner about Mr. Brown, the other apprentice, leaving. He said that when Mr. Brown left, I should not be in a position to take his place, and that he would therefore have to get another apprentice and place him over me. I replied that he was most likely right, because I had not sufficient opportunity of getting experience in the shop. Seeing he was going to put another apprentice over me, and being told by him that he was going to keep me at the same kind of work, were the reasons which ultimately determined me to go away. I used to read hard at night.

By Mr. Edwards: This conversation about Brown took place in October. My brother had not made previous arrangements for me to leave my master. I was perhaps two hours a day in the shop. I was working in the cellar and carrying out parcels the rest of the time. The other apprentice also worked in the cellar, but did not carry out parcels. I did not refuse to work in the cellar. I have complained to my master by telling him I thought it was not my duty. I have read a good deal to get up my knowledge of pharmacy. The other apprentice taught me how to make up half-a-dozen other prescriptions. I did not tell my master that I was going to leave when I went away. I have read some of his books. My master lent me a book when I went away, but I did not take it with me.

William Pybus, the defendant (by Mr. Fawcett), said: I have seen Mr. Horner and told him that he did not do his duty to my son on three different occasions. He complained considerably about the boy being lazy, proud and dull. I said he was a very diligent boy at home and anxious to learn his business. When he came home he was a steady boy. His principal complaint was that he had no chance of learning his business. In consequence of what he said, I complained to Mr. Horner. He used to sit up till twelve o'clock at night reading medical books,—much later than was good for him.

By Mr. Edwards: I did tell Mr. Horner that my son was going to America, and I afterwards said that he would never come back to his shop. When I bound him apprentice, I expected that he was going to learn the business of a pharmaceutical chemist. I expected that I had placed him with a man who would teach him the business. Mr. Horner never told me that he would have to go about running errands.

John Alfred Pybus (recalled) said: I went a month on trial to Mr. Horner. I was never told that I should have to do this work. I did see the other apprentice going errands and working in the cellar.

Mr. Edwards then replied upon the second case, commenting upon the fact that no witnesses were called to rebut the evidence of his witnesses as to the custom of the trade.

His Honour: I am guided by the document before me, which says he is to be taught the profession of a pharmaceutical chemist.

Mr. Edwards: My client did teach him as much as was necessary. I submit we are entitled to substantial damages.

His Honour: I am of opinion that Mr. Horner gave this young man more to do than he covenanted to do. I see he is to be a "faithful apprentice." But what is the custom as to sweeping shops I am not here to judge; I don't think it is a proper way to treat an apprentice. As to the lubricating grease, such a manufacture might be carried on by a large firm in London, but it certainly was not teaching him his business to set him grinding away at soda to make a composition.

Mr. Edwards: There were two apprentices.

His Honour: I don't care about that. If the one apprentice thinks well to do it, that is no reason why another should. Nor do I think it a proper thing to send out an apprentice to a chemist and druggist with soda water, which is not even manufactured on the premises. Then comes the question, is the boy justified in running away in the way he did? I don't think he was, and there must be some damages to Mr. Horner on that point. I don't think myself that he has sustained much damage, as he can get another boy and place him in the same position occupied by young Pybus; therefore, I don't see much damage made out. I think ten pounds a sufficient sum, and find a verdict for £10 in the first case, and a verdict for the defendant in the other action, without costs, and the indentures to be cancelled, as agreed between the parties.—*Evening Gazette for Middlesborough, Stockton and district.*

Poisoning by an Overdose of Opium Prescribed in Mistake.

An inquest was held at Caldbeck on Tuesday, February 13, on the body of Hannah Simpson, a child one year and eight months old. It appeared that the child having been taken ill on the previous Saturday, the mother sent a messenger to Dr. Brown, of Hesket-new-Market, to acquaint him with the child's condition, and ask him to come and see it, or send medicine that would give it relief. In reply, Dr. Brown sent a powder, with an intimation that he would call in the course of the day. The mother, thinking that the powder was an unusually large one, gave only half of it to the child. The result was that in a few minutes the child fell into a sleep and died, without rallying, the same evening with all the symptoms of opium-poisoning.

According to the messenger, he asked for medicine for a "little one;" but Dr. Brown stated that he said he had come from the child's father. Dr. Brown also said that having attended the father for low fever and pleurisy some time since, he, after some questions as to the symptoms, sent a powder containing calomel and opium, which he intended to be administered to the father. The remainder of this powder was produced, and from an examination of it, the original powder was estimated by the medical gentleman who was called in to have contained from two to two and a half grains of opium.

The jury returned a verdict that the child died from opium administered by mistake, arising from a misunderstanding between the doctor and messenger, but they entirely exonerated both parties from blame.

Review.

Pharmacopœa Suecica. Editio Septima. 1869.
Pharmacopœa Danica. Editio Secunda. 1869.
Pharmacopœa Norvegica. Editio Altera. 1870.

These are important recent additions to a class of pharmaceutical publications which, more perhaps than any others, afford an insight into the existing state of pharmacy and therapeutics in the countries from which they emanate. Denmark, Sweden and Norway are among the most northern kingdoms in which works of this description are published; but, although forming the extreme boundary in that direction of the region of advanced civilization, they are by no means behind other and more southern countries in the cultivation of those branches of science and art which contribute to the production of a good pharmacopœia. The countries of Linnæus, Berzelius and Scheele could hardly, indeed, be supposed to be deficient in botanical, chemical and pharmaceutical knowledge; and accordingly we find that in Sweden and Denmark from early periods, and in Norway more recently, well-regulated medical and pharmaceutical institutions have existed, and officially-authorized pharmacopœias have been periodically produced.

The 'Pharmacopœa Holmiensis' was published at Stockholm as far back as 1686. It was succeeded, in 1775, by the 'Pharmacopœa Suecica,' the fifth edition of which appeared in 1817. Of that edition the botanical part was prepared by the celebrated Swartz, and the chemical part by the no less celebrated Berzelius.

The first Danish pharmacopœia was published in 1772, and subsequent editions or reprints appeared in 1786, 1805, 1840 and 1850. This pharmacopœia was used in Norway until the publication, in 1854, of the 'Pharmacopœa Norvegica,' of which the work under notice with that title is the second edition.

These three pharmacopœias have a close relationship, arising, not only from the contiguity and comparatively isolated position of the countries to which they belong, but from other circumstances connected with their production. They nearly resemble each other in size, in language, in arrangement, in the method of description adopted, and in the general nature of the substances described. They have also been further connected by an agreement entered into by the authorities from which they emanate that all important compound medicines, bearing the same name, and ordered in more than one of them, should correspond in composition and strength. It appears, however, from a statement in the preface to the Norwegian Pharmacopœia, that the compilers, although they have endeavoured to carry this important object into effect, have not as yet fully succeeded. The editors excuse the continued existence of some slight differences, on the ground of the present editions being the first in which the attempt at assimilation has been made, while in previous editions there were considerable differences which it was difficult to reconcile at once.

The fact is thus accounted for, that although there is generally a close resemblance between the works under notice, in which there are many points of accordance, there are nevertheless some differences, and some of a rather marked character. For instance, hydrocyanic acid, for which a process is given in the Norwegian Pharmacopœia, is not noticed in the Pharmacopœias of Denmark and Sweden, notwithstanding the fact that we are indebted to a distinguished Swedish pharmaceutist, whose name is often associated with the medicinal acid in this country, for having at least contributed to its discovery.

All these Pharmacopœias are published in Latin, for which we have reason to be thankful. A scientific nomenclature is generally adopted where it is applicable, and in the description of chemical substances the names used are those of Berzelius. Thus we have *chloras kalicus* for chlorate of potash, *chloretum baricum* for chloride of barium, *chloretum ferricum* for perchloride of iron, *chloretum hydrargyricum corrosivum* for corrosive sublimate, and *chloretum hydrargyrosum præcipitatum* for calomel. These names, however well suited for scientific use, have little to recommend them for the purposes of pharmacy. One of the points of non-accordance between the Norwegian Pharmacopœia and the others is in regard to the last of these names, which in the former work is changed to *chloretum hydrargyrosum mite.* The product, also, in this case, is directed to be obtained by sublimation, and not by precipitation. In the Swedish Pharmacopœia precipitated calomel is the only sort ordered, but the Danish Pharmacopœia orders both the precipitated and the sublimed, the latter being named *chloretum hydrargyrosum sublimatum.* Symbolic formulæ are not used for representing chemical substances in the Swedish and Danish Pharmacopœias, and no reference is made in those works to chemical notation; but in the Norwegian Pharmacopœia the names of chemical substances of definite and known composition have chemical formulæ appended, in which the old system of notation is alone followed. In all the works the descriptions of chemical compounds correspond with the old and not the new system.

The arrangement of the matter in all these works is similar to that of the British Pharmacopœia, but with this material difference, that, instead of the several compounds or preparations being brought together under the names of the most important constituents, they are separated under subordinate heads, such as oxides, chlorides, sulphates, etc.; and there is no method adopted for bringing, for instance, the preparations of antimony, or iron, or mercury, into one list, for even the index fails to do this.

The descriptions are generally concise and clear, and undue complications are avoided in the formulæ and processes. It might, perhaps, be even objected that this attempt at simplification has in some cases been carried too far. Chemical processes, as a rule, are not given. When they are given they are generally good, but we observe one remarkable exception to this in the process given in the 'Pharmacopœa Danica' for the preparation of chloroform. Not satisfied with the *chloroformium venale*, the characters of which, and the tests of its purity, are described, a detailed process is given for what is called *chloroformium purum*, but this unfortunately would yield an impure product. The process differs from that usually adopted, and which is given in the British Pharmacopœia, in the omission of the use of oil of vitriol for purifying the crude product. It is well known that mere washing with carbonate of soda, drying with chloride of calcium, and redistilling, will not yield pure chloroform; yet this is the method indicated, in the case alluded to, for purifying the crude chloroform.

Some of the galenical processes differ from ours, and may afford useful hints for improving the processes in our Pharmacopœia. The saving of time seems to have been generally studied. Infusions are made in from a quarter of an hour to half an hour; and tinctures, by digestion—that is, with heat—rather than by maceration, in an equally shortened time. Percolation is not adopted in any case. We are inclined to think, however, that in some of these cases, the quality of the product must suffer from the substitution of a quick, but rough, for a more delicate and refined system of cookery.

Among the general instructions given in each of these works are some relating to the keeping and dispensing of medicines. Thus, for instance, it is stated that in dispensing pills, if the ingredients specified in a prescription fail to produce a good pill-mass, the dispenser is authorized to use one or more of the following excipients, but no others, namely, water, syrup, spirit and powdered marshmallow-root; and to these the Norwegian Pharmacopœia adds glycerine. All pills, when dispensed, are directed to be rolled in lycopodium.

In the formulæ, the quantities of the several ingredients are always indicated in parts by weight, without reference to any specified weights; but, for practical use, the metrical system of weights and measures is that which alone is authorized.

With reference to the keeping or storing of medicines, instructions are given that the most dangerous poisons, of which there is a list, should have a distinctive mark on the labels attached to them, and be kept by themselves; while another distinctive mark is to be affixed to other less dangerous substances, of which there is also a list.

BOOKS RECEIVED.

Medizinische Jahrbücher, herausgegeben von der K. K. Gesellschaft der Aerzte. Redigirt von S. Stricker. 1871. IV. Heft. Vienna.

Report on the Molecular Dissociation by Heat of Compounds in Solution. By C. R. C. Tichborne, F.C.S., M.R.I.A.

Sur un Nouveau Dissolvant de l'Iodure Plombique et son Application a la Pharmacie. Par Donato Tommasi. Paris: Raçon et Cie. 1872.

Consumption and the Breath Re-breathed. By Henry MacCormac, M.D. London: Longmans.

The Uses of Plants in Food, Arts and Commerce. By Ellis A. Davidson. London: Cassell.

Our Food. By Ellis A. Davidson. London: Cassell. From the Publishers.

MEETINGS FOR THE ENSUING WEEK.

Monday, Feb. 26. — *London Institution*, at 4 p.m.—"Elementary Chemistry." By Professor Odling.
Medical Society, at 8 p.m.

Tuesday, Feb. 27. — *Royal Institution*, at 3 p.m.—"On the Nervous and Circulating Systems." By Dr. Rutherford.
Royal Medical and Chirurgical Society, at 8.30 p.m.

Wednesday, Feb. 28. — *Society of Arts*, at 8 p.m.—"The Production of Jewellery by Machinery." By Mr. W. G. Larkins.

Thursday, Feb. 29. — *Royal Society*, at 8.30 p.m.
Royal Institution, at 3 p.m.—"The Chemistry of Alkalies and Alkali Manufacture." By Professor Odling.

Friday, March 1. — *Royal Institution*, at 9 p.m.—"Measuring Temperatures by Electricity." By Mr. C. W. Siemens.

Saturday, March 2. — *Royal Institution*, at 3 p.m.—"Demonology." By Mr. Moncure Conway.

The following journals have been received:—The 'British Medical Journal,' Feb. 17; the 'Medical Times and Gazette,' Feb. 17; the 'Lancet,' Feb. 17; the 'Medical Press and Circular,' Feb. 21; 'Nature,' Feb. 17; the 'Chemical News,' Feb. 17; 'English Mechanic,' Feb. 16; 'Gardeners' Chronicle,' Feb. 17; the 'Grocer,' Feb. 17; the 'Journal of the Society of Arts,' Feb. 17; the 'Chemist and Druggist,' Feb. 15; 'Neues Repertorium für Pharmacie,' bd. xx. heft 12; 'Répertoire de Pharmacie' for January; the 'Photographic Journal,' Feb. 15; the 'Grocery News and Oil Journal,' Feb. 16; 'Carlisle Express and Examiner,' Feb. 17; 'Zigzag,' Feb. 17; 'Evening Gazette, for Middlesborough, Stockton and District,' Feb. 16.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Pharmaceutical Education.

Sir,—I have just read in the Pharmaceutical Journal for January 20, an address on pharmaceutical education, by Mr. Siebold, and having a few weeks since gone through the ordeal of the Minor examination at the North British Branch of the Pharmaceutical Society, I am not prepared to bear out Mr. Siebold's statements. I will not deny that botany is more prominent than it need be, especially structural botany; for instance, in asking candidates for the Minor Examination such questions as—What is a syngenesious flower? What a diœcious flower? Give the diagnosis of certain Natural Orders, etc. Such questions are not only unfair, but absurd, and not at all according to the syllabus of the examination. Besides, botany is a subject which, in my humble opinion, requires more study than most students have in their power to bestow upon it, and I hope that ere long questions will be asked in this part of the examination, which it is more necessary for students to be posted up in.

Mr. Siebold says that qualified men frequently fail, while unqualified men pass. This, even as an exception, I do not think is the case. I understand that if a candidate makes a certain percentage in each subject he will pass; and I do not think the standard number of marks is at all too high for any one with a good general knowledge of the subjects. Mr. S. speaks about the nervousness of the candidates and the harshness of the examiners. If such is the case, I for one failed to see it. On entering the hall on the morning of the examination I must say I felt rather nervous, but no sooner was I seated with the first examiner than his courteous bearing completely dispelled this feeling; and I can bear testimony to the fact that what I experienced from the first examiner I experienced from all the others. Instead of causing nervousness, they seemed anxious to allay such feelings.

Mr. S. also thinks that pharmacy ought to be discarded, on the ground of its endangering a candidate's success; but in this I cannot agree, as the specimens of extracts, tinctures and compound powders generally shown are most prominent ones, and ought to be easily recognized, and the proportions of such as are compound should be on the finger-ends of every one daily engaged in dispensing medicines.

Mr. S. speaks about candidates for the Modified examination not being allowed to show their scientific attainments. I think, then, that with so few subjects, and so little demand for science from them, it is a shame that so many fail. The very word 'modified' explains their examination better than words can do.

Again, as to dispensing, Mr. S. says it ought to be excluded, owing to the awkwardness displayed by candidates who in their own places of business could make a different appearance; but I do not believe there is any examiner but allows for those little displays of awkwardness, provided he sees that the candidate understands what he is doing. If a candidate has been properly trained in this branch of his business, there is little fear of his failure.

In conclusion, looking at the examination as a whole, I think the reform Mr. S. would insist upon is quite uncalled for, with the exception of botany, which perhaps could be modified with advantage. All the other subjects ought to be strictly enforced. I may mention that I met some young men from England the day before the examination in Edinburgh; they were for the Modified examination, and from what I saw of them that day in the hall of the Society, I came to the conclusion that if they passed the examination was not what it ought to be. I found out next day that only two out of seven that came up for that examination had got through, and I was not at all astonished at the result.

Forres, Feb. 14th, 1872. Alexander Fraser.

Sir,—For a scientific man of high attainments, Mr. Agnew seems strangely deficient in that most important "preliminary," accuracy in the use of terms; for I beg to deny that there is a syllable of "personal abuse," "splenetic" or otherwise, in my former letter. I willingly leave your readers to judge whether or not my "satire" was "misplaced." While much regretting that Mr. Agnew's feelings have been outraged, I must affirm it to have been due more to abnormal sensitiveness (probably the result of extreme Continental deference) than to any rough usage by me. If there was any "principle" involved in his letter, I confess I overlooked it in the overwhelming presence of the "person."

Like Mr. Agnew, my "sincere aim and hope" is the advancement of pharmacy, and the recognition of those who practise it as educated gentlemen; but I look for the fulfilment of my hopes by very different means. Mr. Agnew's knowledge of English pharmacists must indeed be limited if he considers "professional studies" incompatible with "trade marks, drudgery and shop." Until the establishment by him and his *confrères* of their proposed Arcadia, I fear these must continue to be necessities, about which we must "hear" a good deal.

Mr. Agnew's letters so irresistibly call up to my mind the famous reproof of the Ettrick Shepherd as an appropriate reply that, despite the risk of being again styled abusive, I cannot forbear to quote it:—"Why dinna ye lairn to speak largh an' low, trusten mair to sense an' less to soun'? Ye'd find yer benefit in it."

Feb. 19th, 1872. A MANCHESTER PHARMACIST.

EARLY CLOSING.

Sir,—For some years I have had a standing advertisement in a local paper as follows:—

"Mr. T. Mayhew, pharmaceutical chemist, respectfully announces that his pharmacy is open from 8 A.M. to 7 P.M. during the six winter months. After 7, attendance is given only in cases of necessity."

At first there was some difficulty, but it gradually diminished, and the after-time applications are now almost none.

I would suggest to others this solution of the early-closing difficulty, feeling sure the public are not persistently unreasonable, and that a little independence tends to enhance the value of services not too highly appreciated.

The time during the six summer months is from 8 to 8.

Glastonbury, 19th Feb. 1872. T. MAYHEW.

THE LAW RELATING TO JURIES.

Sir,—As the Attorney-General is about to lay before Parliament a Bill to amend the law relating to juries, cannot some steps be taken to secure the exemption of all chemists and druggists from serving? At present, the law exempts pharmaceutical chemists only; but as the duties and responsibilities of a chemist and druggist are the same as those of a pharmaceutical chemist, the question naturally arises, and has been frequently asked, why should not the exemption be extended to all on the Register?

Stratford-on-Avon, Feb. 19th, 1872. W. F. S.

POISON REGULATIONS AT BOLTON.

We are requested by the Honorary Secretary of the Bolton Chemists and Druggists' Association to publish the following:—

The Bolton Association of Chemists and Druggists have succeeded in obtaining the repeal of a most stringent and indefinite clause in the local Improvement Act of 1854, which was as follows:—

"And be it enacted, That if any chemist, druggist or other person in Bolton sell any arsenic or prussic acid or any other virulent poison to any person, except in the presence of a witness, and do not at the time of such sale correctly enter in a book the names and addresses of such person and witness, and the nature and quantity of the poison purchased, and the alleged purpose for which it is intended to be used, every person so offending shall for every such offence be liable to a penalty not exceeding £5, and the burden of proving that this provision has been complied with shall rest on the person charged with such offence."

The association arranged a deputation to the Parliamentary Committee of the Corporation, and forcibly explained the position of the chemists in Bolton as singular in being subject to such a clause, urging its repeal on the ground that the Pharmacy Act of 1868 sufficiently protects the public against accident and incompetency, maintaining that the members in that town ought only to be placed under the same restrictions and regulations in reference to the sale of poisons as the trade in general. It is satisfactory to find that their efforts have been successful, the Town Clerk having been instructed to procure the repeal of the clause in question, through the Borough Improvement Act now before Parliament.

DIFFICULTIES IN DISPENSING.

Sir,—Your correspondent, "Dispenser," should have had no difficulty in preparing the prescription mentioned in his letter, neither is there any necessity for altering or amending the formula, as will be found if he follows the enclosed directions.

For 20 pills.

Opii Pur. gr. 2½. (By this I understand pure opium, and not purified opium, *i. e.* ext. opii.)
Plumbi Acet. gr. 5.
Ext. Ergot. Liquid. gutt. (not minims) 60.
Pulv. Ergotæ, gr. 40.

Mix well together in the usual manner, then add from 8 to 10 grs. P. Tragac. Co. and a very small quantity of stiff Tragacanth paste.

I find this to be eminently satisfactory, producing a pill very easy to roll out, and preserving its shape as long as it is likely to be kept.

As regards the second formula, there is nothing unusual about those pills, except their very small size, which will be no difficulty to an experienced dispenser. H.

"*Inquirer.*"—(1.) No. (2.) It is not possible to make the draught bright with the ingredients named.

A. P. S. (Birmingham) is thanked for his communication. It is not desirable to publish it.

A. P. S. (Greenock).—We do not know of any standard size for the pills mentioned.

W. L.—The preparation for which a formula is asked is somewhat extra-pharmaceutical. See some information on the subject in Vol. I. of the present series, p. 1043.

"*Fair Play.*"—Your prescription should make a clear mixture unless the tinct. ferri perchlor. hold some basic oxychloride in solution. If so, on the addition of the quiniæ sulph. a portion of oxide would be thrown down. This would account for the mouldy appearance you mention.

Birchcliffe.—We do not know of such a process.

M. P. S. and *A. Wright.*—No one but a registered chemist and druggist can legally sell a preparation known to contain a poison mentioned in the schedule.

"*Quæsivi.*"—It will be impossible to make this mixture assume a sightly appearance; the alkaloid quinia is sure to get caked into a resinous mass when precipitated by the aromatic spirit of ammonia. We recommend you to rub the citrate of quinia together, dilute freely with water, then add the iodide of potassium, and lastly the aromatic spirit of ammonia.

J. C. H.—The article mentioned is a proprietary preparation, and consequently we are unable to supply the formula.

A. P. S. (Greenock).—It would be correct to measure in the first case twenty, and in the second forty-eight minims.

"*Chas.*"—Tinct. cinchonæ and tinct. cinchonæ co. should be as recently prepared as possible, and filtered as the Pharmacopœia directs. Dec. cinchonæ flav. and inf. cinchonæ flav., which are merely ordered to be strained, should be shaken before using them.

"*Menelaus.*"—Judging from what is paid to indoor-assistants, we should think from £80 to £100.

J. Tully.—The preparation has been the subject of several papers published in this Journal, and we think that similar suggestions have already been made. See the eleventh volume of the second series, pp. 122, 333, 335, 420.

D. E.—We are unable to perceive in what way the use of the label forwarded could be affected by the law of patents. As to the copyright of the name used, we should recommend you to take legal advice.

G. G. G.—The 'Wine Merchant's Companion and Butler's Manual,' London, 1825.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. J. Tully, Mr. W. B. Orton, Mr. G. Druce, E. K. C., D. E., W. T., X. Y., "Ignoramus," "Inquirer," "Hora Somni."

THE MICROSCOPE IN PHARMACY.

BY HENRY POCKLINGTON.

(*Continued from page* 662.)

Having made himself thus conversant with the microscopical character of potato-starch, the student should proceed to prepare the starches of sago, tapioca, arum (Portland arrowroot), maize, rice and wheat. In preparing starch from commercial sago and tapioca, it is needful to be prepared to find the presence of potato-starch and other adulterants. As it fortunately happens that the granules of potato and these other starches differ somewhat widely, the student, with a little care, need not be misled. He will, of course, bear in mind that both sago and tapioca, in their granulated form, have often undergone the application of heat. The starch of tous-les-mois, from its very great size, is so easily recognizable that it hardly requires special comment. If present with other arrowroot, it can immediately be detected by its remarkable uniformity of size, and the greatness of that size. Tahiti arrowroot more closely resembles that of maize than either of the true arrowroots. The East and West Indian arrowroots are to be distinguished from each other by their different sizes, shapes, their "rings," and the position of the hilum. The starch of *Curcuma leucorhiza* (East Indian arrowroot) is described by Schleiden as consisting of "perfectly flat discs, with more distinct layers, in which it is, however, at times doubtful whether they pass entirely round or are only menisci laid one over the other." The West Indian arrowroots are, according to Schleiden, compound granules without evident hilum, "the separate paste-granules always exhibiting smooth connective surfaces." Hassall, on the other hand, I think more correctly, says there is a distinct hilum "seen most frequently as a sharp short line running transversely across the granule." The shape of Maranta granule being, according to the latter authority, "more or less oblong and ovate, sometimes mussel-shaped or even almost triangular. If the student make careful drawings of each of the starches we have named, having a sufficient number of each to "give a good average," he will usually be able, by simple examination of a suspected sample of arrowroot, coupled with a glance over his drawings, to say whether or no it is genuine, without the trouble of comparing the known preparation of the suspected adulterant with that under examination. In all cases where there is the least room for doubt he will, of course, follow the latter plan. The best way of preparing a suspected sample for examination is to sprinkle a little on to a glass slip, and, adding a little glycerine and water, allow it to wait a few moments before covering it with the thin glass, and submitting it to examination. Premising that this mode, with slight occasional modifications, is to be followed, we will give a list of the various starches and their allies which are in common use, and their most frequent adulterants, as a guide to the beginner.

Arrowroot.—Cheaper qualities, maize, rice (H. P.); potato, sago, tapioca (Hassall and others). No mineral matter has, so far as I know, been found.

Tapioca.—Sago, potato (Pereira).

Sago.—Potato (Pereira, PHARMACEUTICAL JOURNAL, Vol. III.).

Amylum triticum, B. P.—Maize starch; one sample all maize (H. P.).

Oatmeal.—Rice, barley, maize.

Proprietary Foods.—Difficult to say what is an adulteration. Some are exactly what they profess to be. Most are preparations or combinations of the farina of maize, rice, lentils, wheat and oats. In some the starch only is used, in others the gluten and fibrine are also present. The mode of examination is the same as with arrowroot, with the addition of something to be spoken of later.

LINSEED MEAL AND WHEAT-FLOUR.

The former of these was the subject of an able paper, read by Mr. T. Greenish, F.C.S., etc., before the last Pharmaceutical Conference, and printed in the current 'Year Book.' Mr. Greenish has fallen into a few inaccuracies with respect to the relative quantities of linseed imported into England from various foreign ports, but these do not affect the value of the paper and the subsequent discussion as calling attention to the excessive artificial adulteration of linseed-meal and linseed-cake, in addition to what may be called their natural adulterants. I lately had under my notice, at a recent meeting of the Hull Scientific Association, a large collection of seeds and other ingredients commonly crushed with, or added to, linseed for meal and cake. These, called variously sesame, poppy, niger, nut Bordeaux, and otherwise, are dignified with the generic title of Buffum. They are of such diverse character that the best plan for the student to adopt is to make a careful study of the structure of the linseed itself, by carefully dissecting off with a sharp scalpel and fine needle its *four* coats. A rough and ready way of doing this is to smash a number of the seeds, and carefully examine the débris, but the beginner would scarcely be able to particularize the several coats. The cells of the outer are hexagonal, and contain the mucilaginous matter for which linseed is remarkable. Dr. Hassall says this coat is composed of but *one* layer of cells, but this is at least doubtful, so far as regards some varieties of linum. The cells of the second coat are rounder, and their walls are much thickened with secondary deposits. I am not clear as to the nature of their contents, but they are probably protoplasmic. The third, very characteristically fibrous or "striated;" and the fourth, of square or oblong cells, containing resinous matter, are tolerably distinct from those of other oil-seeds. The internal structure of the seed does not differ so greatly (as found in meal or cake) from that of many other oil-seeds as to call for special remark. The seeds specially to be guarded against are those of the *Cruciferæ* possessing irritant properties. The testæ of these differ widely from that of linseed, and a careful study of the seeds of mustard (*Sinapis alba* and *S. nigra*, the testæ of these differ), charlock (*S. arvensis*), and other common cruciferous seeds will enable their presence to be readily detected. But of course every careful pharmacist will immediately reject any samples of lini farina that are proved to contain a great amount of admixture, without seriously troubling himself as to the harmless or injurious character of its adulterants. Absolutely pure linseed-meal is hardly to be expected, but there ought not to be any difficulty in procuring a practically genuine sample.

The adulterations of wheat-flour are chiefly confined, so far as my observation extends, to the use of barley, oats, maize, and beans. I have never detected mineral matter, nor indeed anything injurious beyond the occasional spores of fungi (*Puccinia*, *Uredo* and *Ustilago*). The examination of wheat-flour will follow the same general directions as that of arrowroot, with the addition of testing for mineral matter, if any be suspected. This may very conveniently be done on the stage of the microscope, when the presence of the smallest quantity of lime, in the form of "bone-dust" or "sulphate," may be detected. The process is simply that of applying the usual reagents to a small quantity of the flour whilst it is under view, use of the mixed glycerine and water being omitted, and the reagents applied beneath the covering glass.

I have not found the microscopic examination of bread to be of any great use. The usual chemical process had better be followed if the presence of alum or sulphate of copper be suspected. Potatoes may sometimes be found by aid of the microscope, but not often; rice I think never. Beans and barley may be glimpsed, but "not sworn to."

We have now concluded the easy part of our lesson. For the prosecution of our study some knowledge of minute structural botany is necessary, and may be obtained from the careful study of such books as the English translation of Schleiden's 'First Principles' (Hardwicke), Henfrey's 'Botany' (Masters's edition, Van Voorst), Bentley's 'Botany,' and last, but least *only* in size and price, the excellent little manual by Mr. M. C. Cooke (Hardwicke). Young men unembarrassed by the cares of business will doubtless follow the thorough course of training necessary to enable them to become good vegetable histologists as a preparation for the duties of the analyst. But many who have the willingness to undergo this course of study are so occupied with the cares of their businesses and families as to be obliged to content themselves with the smallest modicum of structural knowledge, and may be grateful for a brief outline of the histological characteristics of the various parts of plants made use of in pharmacy or food, so far as such characteristics are recognizable in the official preparation or commercial article. These parts are, the underground and aboveground stems, foliar organs (flowers and leaves) and reproductive organs (stamens, fruits, etc.). We will briefly consider them in the order given.

(*To be continued.*)

VESICATING INSECTS.

BY M. C. COOKE, M.A.

(*Continued from page* 584.)

COURBON'S BLISTER-FLY, *Lytta Courboni*, Guerin. —Guerin; Revue et Mag. de Zool. 1855, p. 590. *Lytta vidua*, Courbon, Comptes Rendus, 1855, t. xli. p. 1005 (not Klug).

This insect is from 22 to 27 millimetres in length. It is entirely black, presenting only at the posterior extremity of the elytra a very small, slightly marked whitish edge or embroidery. It is very common, though much less so than the dotted species. It lives on two leguminous plants, the *Adesmia pendula* and the *Adesmia punctata*, DC. but especially on the former plant, which covers the Cerro of Montevideo, and on the flowers of which it feeds. "I have only met with it," writes M. Courbon, "in the months of November, December, and January, the periods at which the above-mentioned plants are in flower. This insect may be collected like the dotted blister-fly. Its blistering properties are, at least, as energetic as those of the officinal cantharides. Although less common than the beet cantharides, it might yet be employed with considerable advantage, on account of its large dimensions. It would be interesting to decide whether it shares the valuable property of the dotted cantharides. I much regret not having been able to make experiments on this point."

Courbon referred this insect in his communication to the *Lytta vidua* of Klug, and specimens were deposited by him in the Museum of Natural History in Paris. Guerin has examined these specimens, and determined that they do not belong to the species to which Courbon referred them,* so that he has proposed for them a new name, which we have adopted. Klug's blister-fly is also included in our list, on the authority of Moquin-Tandon (Med. Zool.).

The concluding observations of M. Courbon, in his paper, which has furnished the information already quoted, is too pertinent to be omitted. "In these three cantharides," he says, "the blistering principle resides exclusively in the soft or inner parts; the outer, or hard horny parts, which form the skeleton of these insects, do not possess any epispastic property. I at first thought that the soft parts of the abdomen and thorax had the privilege of being the exclusive seat of the active principle, relying on what had been written by M. Farines, of Perpignan, in 1835, namely, that this was the case with the officinal cantharides; but I have ascertained, by repeated experiments, that the soft parts of all regions possessed the same property. Thus the interior parts of the head and thighs, which I used separately, possess a power as great as do the inner parts of the abdomen and thorax, while the framework of these regions, to which we must add the antennæ and those portions of the feet which are composed of hard material, are completely inert. I made these experiments separately for the three Montevidean species, and also with the same results on the officinal cantharides."

KLUG'S BLISTER-FLY, *Lytta vidua*, Klug; black; thorax, margin of elytra and base of the tibiæ whitish.—Klug Nova Acta Nat. Cur. p. 437, xii. t. xli. f. 7. *Causima vidua*, Dej. Length 8–10 lines. Head large, subcordate, punctate laterally, and the palpi cinereo-villose. Eyes emarginate, testaceous. Antennæ short, cinereo-villose. Thorax short, unequal, plane, impressed in the middle, punctate, subpilose, black, posterior margin whitish. Scutellum indistinct. Elytra punctato-rugose, somewhat trilineate; outer margin and apex whitish-ciliate. Breast punctate, fusco-pilose, margin whitish. Abdomen punctate; segments albido-ciliate. Feet black, tibia whitish-pilose.

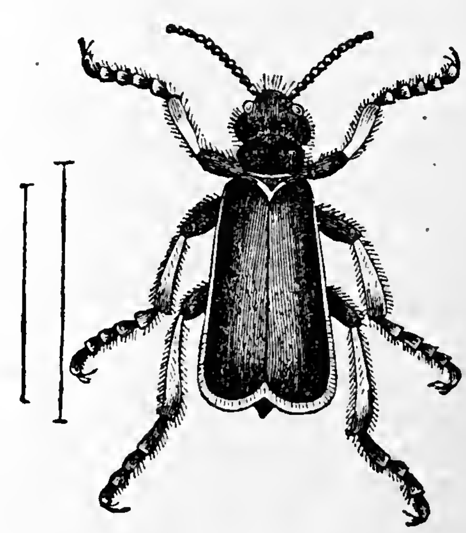


Fig. 13.—*Lytta vidua.*

* Guerin, Revue Zool. 1855, p. 590.

Native of Monte-Video.

According to Moquin-Tandon this species is constantly employed as a vesicant. It has possibly been confounded with *L. Courboni*.

SPECKLED BLISTER FLY, *Lytta atomaria*, Germ.; black, covered with a greyish tomentum; elytra with numerous spots, when denuded black.—Germ. Mag. iv. p. 154, 1862. *Cantharis atomaria*, Fischer. Tent. Consp. Canth. p. 24; Brandt and Ratz. ii. t. xviii. f. 8. Length 6½ lines. Native of Brazil.

Fig. 14.—*Lytta atomaria.*

Head moderately large, almost roundish four-cornered, spotted, black, in some parts thickly covered with greyish-white hairs, elsewhere bald, and hence apparently spotted, owing to the appearance of the colour of the head. Forehead slightly arched, with a smooth, bald, brilliant longitudinal depression in the middle and broader at the lower end. Scutellum slightly arched, with a tolerably straight edge behind. Antennæ one-third shorter than the body, almost bald and thread-shaped. The first joint funnel-shaped and wedge-shaped, towards the upper part very slightly thickened, hairy, only a little longer than the second, which is funnel-shaped and hairy. The third joint almost cylindrical, about one-third longer than the first. The last joint cylindrical, gradually terminating in a bluntish point. Prothorax partially covered, like the head, with greyish-white hairs, above elongated and four-cornered, at the front end somewhat narrower. Lateral edges only slightly apparent and almost straight. The upper side with a tolerably considerable longitudinal furrow in the middle. Shield very small, three-cornered, almost bald. Wing-covers somewhat widened towards the hinder part, black, thickly covered in some places with greyish-white hairs, between which there are considerable bald spots. Stomach black, covered with greyish-white hairs, which are especially thick at the hindermost edge of the ring, with moderately large punctiform bald places on the middle. Legs slender, black, covered with grey hairs at the upper part and especially on the under side; upper side of the tarsi with only very fine hairs. The antennæ and the upper side of the tarsi are brownish-black. At other parts the animal appears grey from the hair, and on the head the thorax, the under-stomach and the wing-cases spotted black. The spots on the wing-cases are very considerable and distinct; those of the stomach, the head and the thorax are smaller; on the two last-named parts they are less distinct, 6–7 lines long.

PUNCTATE BLISTER FLY, *Lytta punctata*, Germ.; blackish-brown, with a fuscous tomentum; elytra studded with numerous points, when naked black.—Germ. Sp. Ins. i. 173. *Lytta Germaria*, Fisch. Consp. Canth. 1827, p. 24. Allied to *L. atomaria*, but smaller. Head oval, fusco-tomentose, with scattered puncta, when naked black. Antennæ black; thorax short, convex, subglobose, channelled dark brown, fusco-tomentose, with two black spots. Elytra bark brown, densely fusco-tomentose, with numerous, scattered, inordinate puncta, black when denuded. Body beneath, with the feet, densely tomentose.

Native of Banda Oriental and Entre Rios.

Burmeister says that it is very like the *Bicho morow;* but the elytra are more strongly marked with black dots, and the feet are of the same brownish-black as the rest of the body. "I have found it," he adds, "in the Banda Oriental and in Entre Rios, near the Parana." He cites it as one of the applied vesicants with which he is acquainted.

(*To be continued.*)

THE EUCALYPTUS GLOBULUS AND ITS USE IN MEDICINE.

The employment of the *Eucalyptus globulus* in therapeutics is the subject of a very important memoir by Professor Gubler, in which he expresses an opinion that it will probably prove to be a remedy worthy of being ranked with the cinchona alkaloids. We take the following particulars from the *Journal de Pharmacie et de Chimie* for December:—

The *Eucalyptus globulus* belongs to the Natural Order *Myrtaceæ*, which furnishes the clove (*Caryophyllus aromaticus*), oil of cajuput (*Melaleuca minor*) and the pimento (*Eugenia Pimenta*). It is one of the noblest representatives of a genus that contains upwards of a hundred species. It is often gigantic in size, and is impregnated throughout with an aromatic substance, which is present, however, in smaller proportions in the wood and the bark than in the flowers and the leaves. The tree is easily acclimatized in the southern provinces of France, Corsica, Algiers and Spain, being known in the last-named country under the popular name of the fever-tree.

An essential oil, having the formula $C_{12}H_{40}O$, is obtained from the leaves by distillation, which has been named by Cloetz, who investigated its composition, eucalyptol. The results of this investigation have already been printed in this Journal.* Eucalyptol has an agreeable, fragrant, aromatic and peculiar odour, which by some has been compared to camphor, by others to rose or lavender. It has an aromatic, warm and bitter flavour, accompanied by a slight acidity and freshness at the back of the throat; when in excess, however, it produces a burning sensation, and an increased secretion of saliva. Doses of from two to four grams and upwards cause a disturbance of the digestion, sometimes succeeded by a diarrhœa in which the motions, like the eructations, recall the smell of the eucalyptus. Large doses sometimes cause headache, excitement and fever, with accelerated respiration, thirst, sickness and generally sleeplessness; upon anæmic persons, however, it acts as a narcotic. The symptoms rarely last more than a few hours. In most cases one to two grams can be tolerated at first, and in all cases the patient easily becomes habituated to its use. The physiological action of the leaves is very similar, and it has been found that they can be taken by fresh patients in larger doses than the free essence.

In Australia the *Eucalyptus globulus* is the popular remedy for fevers, and in Europe it has been used successfully in the treatment of diseases prevalent in marshy districts. M. Gubler quotes the testimony of several medical practitioners, who say that it produces marvellous results in cases of intermittent fevers, especially obstinate ones where sulphate of quinine has been used without effect. He

* PHARM. JOURN. 3rd Ser. Vol. I. p. 78.

also points out that in marshy districts near to eucalyptus forests intermittent fevers are unknown, —a result that he attributes either to the neutralization of the effluvia by the aromatic emanations from the trees, or else to the sweetening of the stagnant waters by the leaves and pieces of bark that fall into them, such waters, according to travellers, being perfectly potable. Efforts are therefore being made to increase the number of eucalyptus plantations in the marshy and insalubrious districts of Corsica and Algeria.

The tincture, infusion and decoction of eucalyptus are used for disinfecting the dressings of wounds. M. Marès has employed fresh young leaves as a local stimulant to small wounds slow to cicatrize. Dilute essence, infusion and distilled water of the leaves are used as astringents and hæmostatics. The preparations are also used with success in purulent catarrhal affections of the urethra and vagina. The leaves, when masticated, perfume the breath, and harden spongy and bleeding gums.

The presence of the essence of eucalyptus retards in a remarkable manner the development of cryptogams. According to M. Gubler, solutions of salts of strychnia, atropia, morphia and aconitia, prepared for hypodermic injection with the distilled water of the leaves, remained clear for many weeks; while others, prepared at the same time with pure water, became turbid with confervoid growths in a few days.

The following are the pharmaceutical preparations of eucalyptus that have been found convenient in use:—

1. The *powdered leaves*, which is the best form, and is prescribed in doses of four, eight, twelve and even sixteen grams a day.
2. The *infusion* and *decoction*, which M. Gubler recommends should not be submitted to too much heat, in order not to drive off the essence.
3. The *distilled water* of the leaves, an agreeable vehicle for stimulants.
4. An *aqueous maceration of eucalyptol,* with the same properties.
5. The *aqueous extract*, recommended by M. Carlotti to prevent the return of intermittent fever.
6. The *alcoholic extract*, *tincture* and *alcoholate*.
7. *Eucalyptol*, which is administered either in pills or in capsules.
8. *Inhalations* of eucalyptol.

LITMUS PAPER AS A REAGENT.

BY CHARLES BULLOCK.

In using litmus paper as a reagent to detect the presence of acids and alkalies, the suggestion sometimes occurs, "what amount of acids or alkalies is necessary to give a distinct change of colour to the test paper?"

The result of a few experiments to determine approximately the above question, may be of interest to the readers of the Journal.

Blue litmus paper should be distinctly blue, but not a deep shade in colour. The directions given by Fresenius in his 'Qualitative Analysis' will afford a sensitive paper; when carefully made it affords the reactions with one drop of acetic acid No. 8 (30 per cent. acid) in the following amounts of water:—

In four ounces of water it turns red immediately; in six ounces, completely red in one-half minute; in ten ounces, changes on the edges in one-fourth minute, and is completely reddened in one minute; in thirteen ounces it is completely red in a minute and a half, and remains red when dry. In sixteen ounces of water the limit of distinct reaction is found.

Reddened litmus paper.—Reddened litmus solution should have a purple red colour, and the paper, when dry, a distinct red colour free from blue.

With one grain anhydrous carbonate of soda in 32 ounces of water, the paper turns blue in one minute; in 56 ounces of water, in three minutes; in 64 ounces of water, in four minutes; in 80 ounces of water, in seven minutes; in 160 ounces of water is found the limit of distinct reaction—the blue shade can be seen before the colour is dissolved from the paper.

In making the above experiments the paper was submerged in the liquid.—*Amer. Journ. Pharm.*

ESSENTIAL OILS.*

BY J. H. GLADSTONE, PH.D., F.R.S.

PART II.

(*Continued from page* 688.)

The compound of colophene with the acid gas was similarly formed and examined. It was very viscid, and of a dirty brown rather than an indigo colour, as previously described. It lost nearly all this colour, together with the smell of hydrochloric acid, when heated in a water-bath or exposed over potash in vacuo; but it still retained some chlorine; a very little, however, for analysis showed only 1·76 per cent. in the first instance and 2·01 per cent. in the second. If we suppose the whole of the colophene combined with this hydrochloric acid, we should arrive at the very improbable formula of nothing less than $C_{120}H_{192}HCl$. The power of HCl to combine with these hydrocarbons evidently becomes greatly diminished as their molecules become more complex.

The hydrocarbons of the first group, derived from oil of turpentine, orange-peel, cedrat and thyme were found to require from 5·3 to 5·6 volumes of slightly diluted methylated spirit to dissolve them; while the hydrocarbons of the second group, from oils of calamus, cubebs, patchouli and rosewood, required from 27 to 30 volumes. Colophene and paracajputene are almost, if not wholly, insoluble in aqueous alcohol.

It is well known that strong sulphuric acid acts powerfully on oil of turpentine, giving rise to two new isomeric compounds, terebene and colophene. It was found to have a similar action on the hydrocarbon from nutmeg; but when a member of the second group was submitted to its action, nothing analogous to colophene was produced.

Another distinction between the groups is a small but clearly recognizable difference in their expansibility by heat. On referring to my former paper it will be seen that the "sensitiveness" of the first group varies from 46 to 49, while that of the second group never exceeds 45, and averages 43. Colophene is only 41. In connection with this matter the following determinations were made of the expansion of oil of turpentine by heat:—

Oil of Turpentine.

Temperature.	Specific gravity.	Expansion for 5° C.
15° C.	0·8665	—
20° „	0·8632	0·0033
25° „	0·8599	0·0033
30° „	0·8565	0·0034
35° „	0·8531	0·0034
45° „	0·8464	0·00335

* Read before the Chemical Society, Dec. 7, 1871 (*Journ. Chem. Soc.* [2] x. i.).

Oil of rosewood was found to expand 0·00321 or 0·00325 for each 5° C. between 0° and 50°.

Thinking that the hydrocarbon from oil of cedar, for which Walter obtained a vapour density of 7·5, and to which he assigned the composition $C_{16}H_{26}$, was probably a member of the second group, I prepared some and purified it, as recommended by him, by distillation from anhydrous phosphoric acid. The result was a liquid having the following properties:—

Specific gravity at 18° C.	0·9231
Refractive Index for A	1·4964
Dispersion	0·0276
Boiling-point	252° C,
Solubility in alcohol	Slight.

These all agree with the properties of other hydrocarbons of the formula $C_{15}H_{24}$, with which also the proportions of carbon and hydrogen found by Walter are sufficiently in accordance.

Hydrocarbons were also obtained from oil of sandal wood and oil of vitivert, by destroying the oxidized constituent by means of sodium; but the yield was small. In each case the oil was sparingly soluble in alcohol and rather viscid. Other properties were as follow:—

	Santal.	Vitivert.
Specific gravity	0·9190	0·9332
Refractive index for A	1·4867	1·5061
Boiling-point	—	255° C.

This is enough to show the analogy to cedrene, but neither specimen was perhaps completely purified.

The general result of these observations, together with those previously made, will be seen by the subjoined table, by which also it will be evident that the middle or fifteen-carbon group is intermediate in all its properties, and that these three groups do not pass by insensible gradations into one another, but are separated by strongly-marked divisions.

	10-Carbon Group.	15-Carbon Group.	Colophene.
Formula	$C_{10}H_{16}$	$C_{15}H_{24}$	$C_{20}H_{32}$
Vapour-density	4·7	7·1	—
Character of liquid	Limpid.	Viscid.	Very viscid.
Specific gravity at 20° C.	0·846–0·880	0·904–0·927	0·939
Refractive index for A, at 20° C.	1·457–1·467	1·488–1·497	1·5084
Dispersion	About 0·027	About 0·029	0·031
Sensitiveness	About 48	About 43	41
Boiling-point	160°–176°	249°–260°	315°
Action of sulphuric acid	Polymerizes.	Doubtful.	None.
Solubility in aqueous alcohol	Freely soluble.	Sparingly soluble.	Insoluble.
Combination with HCl	$C_{10}H_{16}.2HCl$ and $C_{10}H_{16}.HCl$	$C_{15}H_{24}.2HCl$ and in smaller proportions.	Very small quantity.

There is no difference in specific refractive energy, and the various members of the ten- and fifteen-carbon groups at least have powerful odours, and rotate the plane of polarization strongly, sometimes in one, sometimes in the other, direction.

(*To be continued.*)

COMPOSITION OF URINE.

In a paper recently published, Mr. J. A. Wanklyn gives the result of some interesting experiments he has made in the chemical examination of urine. Pointing out the fact that determinations of the specific gravity of urine are frequently faulty through inattention to the temperature, and that a slight difference in specific gravity corresponds to a great alteration in solid contents, he recommends that they should be replaced or supplemented by the determination of the solids left on evaporation, and the ash left on incineration. Mr. Wanklyn recommends operating on small quantities, and states that although the urine varies, the proportion between the organic matter and the mineral matter in healthy urine is remarkaby constant. Thus, in five cases where one hundred cubic centimetres of urine of healthy persons were examined, he found:—

MINERAL MATTER.	ORGANIC MATTER.	RATIO.
I.—1·50 grams.	2·53 grams.	1 : 1·69
II.—1·40 "	2·34 "	1 : 1·67
III.—1·48 "	2·38 "	1 : 1·61
IV.—0·60 "	0·80 "	1 : 1·33
V.—2·00 "	2·40 "	1 : 1·20

In these specimens, the proportion of organic matter to ash never exceeded 1·7. But in some urine from a patient suffering from a disease of the kidneys, the quantities of mineral and organic matters in 100 cubic centimetres were,—mineral matter, 0·63 grams; organic matter, 2·03 grams: ratio, 1·00 to 3·22.

CINCHONA CULTIVATION IN INDIA.

No. 1.—*Letter from* J. Broughton, Esq., *Government Quinologist, to the Secretary to Government, Revenue Department, Fort St. George, dated Ootacamund,* 31*st July*, 1871.

As in certain former reports, I have the honour to adduce analyses which express the changes in the composition of our oldest barks during the past two years. The following table expresses the amount of alkaloids in the trunk bark of the eldest trees of *C. succirubra* in the month of May, the period of maximum yield in the respective years. The amount is expressed in percentages of dry bark:—

	1868.	1869.	1870.	1871.
Total alkaloids	6·74	7·43	7·60	7·85
Total sulphates obtained	6·06	6·43	6·00	5·45
Quinine	2·40	1·72	1·73	1·80
Cinchonidine and cinchonine	4·34	5·71	5·87	6·05
Sulphate of quinine obtained crystallized	2·21	1·51	1·40	1·15
Sulphate of cinchonidine obtained crystallized	3·85	4·92	4·60	4·30

2. The above analyses show that up to May, 1871, the total amount of alkaloids in the red bark had continued to increase. But as I had the honour to mention in a report dated August 17th, 1868 (Proceedings Madras Government, 22nd September, 1868, No. 334, Revenue Department), as being highly probable to occur, the annual increments diminish in amount, a circumstance which indicates that the bark is arriving at its maximum of yield. The numbers which approximately express the annual increments during the period of my observations are 0·75, 0·69, 0·17, 0·25. The circumstance that

these numbers do not accurately express a regular diminution of increment is doubtless attributable to the difficulty which occurs in collecting, in successive years, a sample which shall accurately represent the mean yield of the bark of a large number of trees, together with the difficulty in collecting the samples each year under precisely comparable circumstances.

3. From certain results obtained in the comparison of the analyses of barks that have been treated with moss with those of the natural unmossed bark, I am strongly inclined to believe that if the bark of our oldest trees has not actually reached the age of its greatest yield, it must have very nearly approached it. As this is a point of some importance, which cannot be held decided without positive proof hereafter be obtained, I here merely mention my personal opinion.

4. In a report appearing in Proceedings Madras Government, 22nd February, 1870, No. 235, para. 4, I had occasion to mention that the amount of quinine had diminished during past years in the red barks, although that of the total alkaloids had increased. During the last two years it appears that the amount of quinine has remained nearly constant, and probably in years to come its amount will hereafter remain nearly stationary in our red bark.

5. From the above analyses, it also seems probable that the amount of obtainable crystallized sulphate of cinchonidine is diminishing with the increase of age. But, with the present evidence, I cannot hold this yet to be quite clear; since the determination of the amount of crystallized sulphates is apt to be modified by circumstances other than the real amount of pure alkaloid, which latter it only approximately indicates.

6. The large amount of variation according to circumstance of growth met with in the bark of *C. officinalis*, renders a precise determination of its *mean* quality a work of great difficulty. I here quote certain analyses of this bark calculated in percentages of its dry state:—

Crown Bark from Dodabetta Plantation.

	1. Trees of good growth, 6 years 6 months of age.	2. Trees of good growth, 5 years 9 months of age.	3. Oldest Trees.	4. Trees of fine growth.
Total alkaloids	5·26	3·10	6·53	6·91
Quinine	3·48	1·62	4·18	4·71
Cinchonidine and cinchonine	1·78	1·50	2·35	2·20
Sulphate of quinine obtained crystallized	3·25	1·64	4·17	4·80
Sulphate of cinchonidine obtained crystallized	2·04	1·14	1·57	1·60

Crown Bark from Neddivuttum Plantation.

	Trees 6 years 9 months of age.	Trees 6 years 3 months of age, of good growth.
Total alkaloids	4·96	6·01
Quinine	3·03	4·19
Cinchonidine and cinchonine	1·93	1·32
Sulphate of quinine obtained crystallized	3·14	4·24
Sulphate of cinchonidine obtained crystallized	1·05	1·39

7. The above analyses, though comparatively useless to determine the alteration of the bark with age, are adduced as showing the high quality of the barks. Though it falls without my province to speak of the improvement in the growth of the *C. officinalis* trees, yet I cannot forbear to remark that a low yield is getting much less frequent in their bark than formerly. Both the crown barks of Dodabetta plantation, which consists entirely of this species, and those of Neddivuttum, are improving in quality. The increase in the yields of alkaloids is quite apparent, although I cannot with accuracy express its actual amount. This increase is due to quinine; and at present it actually appears probable that hereafter the total yield of alkaloids will equal that of the red bark. These two kinds divide between them nearly the whole of our plantations. For European quinine manufacture, the bark of *C. officinalis* is admirably suited, as it is so rich in quinine. In addition, it is easy to work, and the sulphate of quinine crystallizes with great readiness and purity. It is especially the bark for export to Europe. A small quantity is now packed for sending to England, and I trust that, from time to time, its export may be continued.

8. In total yield the bark of *C. succirubra* is the richest, but, in its natural state, at least, this consists mainly of cinchonidine, cinchonine, and occasionally quinidine,—alkaloids which custom and the addition of fresh names, coincident with the first separation of these substances, have kept out of extensive therapeutical use. The medical reports of the Cinchona Commissioners of the Indian Presidencies, and the report on the medical use of "amorphous quinine," appear to indicate that these alkaloids—and consequently red bark—is the kind that can be employed most usefully in India. In Europe the price of the natural red bark will hereafter sink, when it is brought into competition with crown bark. How far, by careful special cultivation of the red bark, it may hereafter be possible to modify this result, it would at present be premature to speculate.

9. After the above kinds, the most important at present cultivated on the plantations is undoubtedly that of *C. calisaya*. As in my former reports the trees of *calisaya* were very young, it is quite natural to find the amount of alkaloids in the bark has increased. The most remarkable point about the plants of *C. calisaya* is the great number of varieties. These display almost every habit. As it was necessary to examine the bark of the trees of most marked character, in order to determine the kind most suitable for cultivation, these varieties have taken up much time. I have the honour to quote the analyses of several of these varieties. The alkaloids are given in percentages contained in dry bark.

Trunk Bark of C. calisaya *grown at Neddivuttum.*

	I.	II.	III.	IV.	V.
Total alkaloids	3·95	3·93	5·28	4·16	5·36
Quinine	2·67	3·18	1·02	2·50	4·67
Cinchonidine and cinchonine	1·28	0·75	4·26	1·66	0·69

10. These represent fairly the different yields I have met with among the kinds of *C. calisaya* raised from seed obtained from Mr. Money. They are, as a whole, of good quality, but No. V., or the bark of a variety with broad leaves, which are red in the under-surface and of vigorous habit, is the kind which should be propagated, as it is the one whose cultivation can be most profitably extended. I have examined the bark of several other varieties besides those whose analyses are given above, but find them all inferior to No. V., and promising nothing remarkable in their qualities. The bark of our *C. calisaya* is of excellent quality, and is better suited for quinine manufacturers' use than that of *C. succirubra*.

I regret that a larger number of the trees has not been planted, but as the yield of bark from the present plantations will shortly be so large, I cannot now recommend any considerable extension, even with this sort.

11. In a report appearing in Proceedings Madras Government, Revenue Department, No. 334, paras. 22 and 23, I had occasion to remark that in the barks of *C. succirubra* and *officinalis* a high mean temperature appeared unfavourable to the production of quinine, that alkaloid occurring more readily in the bark of trees grown at high elevations, within certain limits. I have met with a remarkable illustration of this principle also in the bark of *C. Peruviana*. The bark of this tree grown at Neddivuttum generally contains no quinine whatever, and, at best, contains it in so small an amount that it is with difficulty it can be clearly detected. But the superintendent of the plantations has with great judgment experimentally planted several of these trees at Dodabetta Plantation, where they grow with much difficulty, from the cold being too great for them. An analysis of the bark of one of these trees gave the following results, to which, for comparison, I attach an analysis of the bark grown at Neddivuttum.

Dodabetta.

Total alkaloids	2·06
Quinine	0·79
Cinchonidine and cinchonine	1·27
Sulphate of quinine obtained crystallized	0·67
Sulphate of cinchonidine obtained crystallized	0·94

Neddivuttum.

Total alkaloids	6·25
Soluble in ether	0·41
Cinchonidine	2·00
Cinchonine	3·84
Sulphate of cinchonidine obtained crystallized	1·80

Though the bark of *C. Peruviana* from Neddivuttum contained a small amount of alkaloid soluble in ether, it was not quinine. But by growing the same species at the higher elevation of Dodabetta Plantation, its bark quite alters its character, and yields in analysis an amount of pure quinine, which readily crystallizes as sulphate. Indeed, the bark thus grown far more resembles the bark of *C. succirubra* than a grey bark. I cannot but consider this instance of a total change of alkaloid, by increase of elevation, a most interesting one.

12. The occurrence of several remarkable varieties among the trees raised from seed has directed my attention to the occurrence of hybrids among our species of cinchona. In one instance I was able, from the account given by Mr. C. Dawson, then Assistant Superintendent at Neddivuttum, to directly trace the origin of a very beautiful plant, which was found to be a hybrid between *C. succirubra* and *micrantha*. This plant was picked up a seedling under a tree of the latter. I analysed its bark, and found its yield was poor, but represented a mean between the qualities of the two species. Examination among seedling trees led to the discovery of many other examples of hybridism, especially to cross-breeds between *C. succirubra* and *officinalis*. In 1870 I communicated a short memoir on the subject to the Linnean Society.* The occurrence of the dimorphic varieties, "*macho*" and "*hembra*," in each species of cinchona was shown in this communication to render cross-breeding highly probable, in the same manner as has been shown by Darwin to occur in *Primula*, *Oxalis*, and other plants. I learn from the discussion which took place on the subject at the Society's meeting, that the fact of the tendency of cinchona to hybridism was considered proved. Since that time I have made numerous analyses of the bark of various hybrids that I have observed, but in no one instance have I found any of special excellence. In fact, it appears to me that these hybrids combine the bad qualities of both their parents. I therefore do not quote the analyses.

* Read, March 3rd, 1870.

13. I cannot but think that this ready hybridism between the species of cinchona affords an explanation of the occurrence of the numerous *varieties* which have been recognized by botanists. I observe, for instance, that a most recent classification gives thirty-three undoubted species, and nearly eighty separate varieties of cinchona. On our plantations there are several plants which, though certainly hybrids, would undoubtedly be made into species by a botanist ignorant of their origin. It seems therefore not improbable that several species, to which a separate name has been attributed, may be only South American hybrids. It is to be hoped that in any future botanical classification of the genus this circumstance may be borne in mind.

14. This fact of the inter-breeding of the species renders the seed of a tree, surrounded with many others of a different kind, subject to considerable uncertainty of producing all plants like its parent. As a fact, the seeds of the variety I called provisionally *lanceolata*, gave but few plants which resembled their parent, and consequently the *seedlings* had to be discarded. As the tree producing the seeds was surrounded on all sides by the ordinary crown barks, the variation in the seedlings becomes intelligible.

15. I observe that Dr. Weddell, in his "Notes sur les Quinquinas" ('Annales des Sciences Naturelles,' 5me série, tomes xi. and xii.), and, at the suggestion of Mr. Howard, calls the valuable variety I called *lanecolata*, above alluded to, *Cinchona officinalis*, *Bonplandiana angustifolia*, remarking that *lanceolata* does not express so well as *angustifolia* the peculiar shaped leaf. I would suggest that the name *angustifolia* be, in future, adopted as the name of the variety.

16. In several preceding reports I have abundantly stated my convictions, and their grounds, for considering that living cinchona bark has its yield of alkaloids injured by exposure to sunlight. The experimental evidence of this already adduced appears to me to be quite conclusive of the fact, so that further proof is scarcely needed. Further proof appears, however, in the circumstance of which I have been for some time aware, that the bark of opposite sides of the same tree differs in yield of alkaloids. This, of course, is only fully apparent in trees that are equally exposed to sunlight on each side, which, from the site of the plantations, does not generally occur. But the following analyses express the yields of the bark taken respectively from the north and south sides of a tree which is equally exposed on all sides. The bark was taken 25th July, 1871.

	North Side.	South Side.
Total alkaloids	3·18	3·80
Quinine	0·62	1·40
Cinchonidine and cinchonine	2·56	2·40

17. As the sun has been on the north side of the tree for the last four months, the effect has been that the yield of alkaloids has been diminished 0·68 per cent. This decrease apparently consists of quinine, which is commercially the most valuable of the alkaloids. This effect has been produced in spite of its being the most cloudy period of the year.

PUBLIC DINNER TO SIR ROBERT CHRISTISON.

Sir Robert Christison, Bart., having completed the fiftieth year of his professoriate in the University of Edinburgh, it was resolved, as we announced in a recent number, to take advantage of the occurrence to testify to that distinguished physician and pharmaceutist the esteem in which he was held by students formerly or at present under his tuition, and by scientific men and the public at large, by inviting him to a public dinner in Edinburgh, on Friday, 23rd February.

The day's proceedings were commenced by the presentation to Sir Robert of a sword of honour that had been subscribed for by the officers and privates of the University (Fourth) Company of the Queen's Edinburgh Volunteer Rifle Brigade.

This was followed by the presentation of an address of congratulation from the Edinburgh University Club in London. The presentation took place in the Library of the University. Principal Sir Alexander Grant occupied the chair, and nearly all the professors of the University, in their robes, were present. The deputation consisted of Dr. Dyce Duckworth (who read the address), Dr. Alexander Halley and Mr. Richard Davy.

At half-past six a company, numbering about two hundred and fifty gentlemen, sat down to dinner in the Douglas Hotel. The Right Hon. John Inglis, Lord Justice-General, Chancellor of the University of Edinburgh, occupied the chair. The croupiers were Sir William Stirling-Maxwell, Bart.; Sir Alexander Grant, Bart.; Robert Patterson, Esq., M.D., President of the Royal College of Physicians, Edinburgh; William Walker, Esq., President of the Royal College of Surgeons, Edinburgh; and G. Fleming, Esq., President of the Faculty of Physicians and Surgeons, Glasgow.

After the usual loyal and municipal toasts, the Chairman rose to propose the toast of the evening. He said that, on the 23rd of February, 1822, Dr. Robert Christison was installed into the Professorship of Medical Jurisprudence in the University of Edinburgh, and from that date to this, uninterruptedly, he had exercised the functions of a Professor in that University. It had been his rare fortune to pass through that protracted career without any serious disturbance or check, and after earning a reputation of which the greatest and wisest might be proud, he stood before them that day in all the strength of his manhood; his physical energies scarcely affected, and his intellectual powers as fresh and vigorous as they were in what most men esteem the prime of life. Sir Robert might be said to be a favourite child of the University, for, although not born in the academic purple, when he was only nine years of age his father became a Professor. Consequently, he received all his university education in the same place, and having passed through a long course of medical and surgical study, he took his degree of M.D. just four years before he became Professor himself. Having been thus efficiently equipped, Sir Robert met his class, which consisted of only seven students. He was ten years in the chair, and bequeathed to his successor a class of ninety students; but in the interval, in 1829, he published the first edition of his 'Treatise on Poisons,'—a work which was at once received by physicians and jurists and men of science as the most philosophic and complete work that had yet been published on the subject. Many changes had been introduced in the details of toxicological manipulation; but so far as principles were concerned, and as far as the exposition of the nature and action of poisons was concerned, he believed it to be still unrivalled. In the preparation of such a work the most accurate observations were required in the selection of material, the most perfect foresight in avoiding all disturbing elements in the conduct of his experiments, and the most vigilant observations during those processes. Some of the experiments which the toxicologist must make were marked by other characteristics, such as (he begged pardon for saying it) enthusiasm and courage bordering on foolhardiness; and amongst other adventures, Sir Robert dabbled in poisons, and experimented on his own precious person in a way that they would scarcely believe. His Lordship proceeded to speak of Sir Robert's experiments to find out whether arsenious acid had a sweet or a bad acrid taste. Sir Robert pronounced it to have a sweet taste, and this view was adopted by almost all toxicologists, with the exception of Orfila. Another subject which occupied Sir Robert was his experiments on Calabar beans. On one occasion he took a dose of these before going to bed, and found that it acted a good deal like opium. He had a good sleep and felt very comfortable next morning, and rather disappointed at the result, so he took a considerably larger dose before he dressed himself. Ere he had concluded dressing, the doctor felt satisfied that he had got hold of a very energetic poison; for the truth was that he collapsed, and no one could tell what the consequences might have been if he had not swallowed his shaving water as an emetic. He became partially relieved, but still the symptoms were very alarming, and he rang for his son and asked him to send for two medical men. His Lordship then proceeded to bear testimony to Professor Christison's position as a medical jurist; he meant his appearance as an expert in courts of justice. He began very early in the year 1829 as a skilled witness in the famous trial of Burke and Hare, and he believed the last case in which he appeared was in 1866, in a civil case popularly known as the "Esk Pollution Case." In the whole of that interval Sir Robert Christison was engaged in every case of importance that occurred in Scotland and frequently in England, amongst others in the trial of Palmer for poisoning by strychnine. Sir Robert never went into the witness-box in the spirit of a partisan, but always as a medical jurist, to aid the Court and the jury in the elucidation of truth, and in serving the ends of justice. Sir Robert's transference to the Chair of Materia Medica in 1832, and the lamented death in rapid succession of three great physicians in this city—Abercromby, Alison and Davidson—diverted his attention to another channel, and led to an extensive practice as a physician. His Lordship concluded amidst loud and prolonged cheering, by proposing "The health of Sir Robert Christison, Bart."

In responding, Sir Robert alluded to the great kindness he had received, and especially during the last twelve years. In that time he had been thrice chosen by his colleagues representative of the Senatus Academicus in the University Court. He was also appointed by her Majesty to represent the profession in Scotland upon the Medical Council, and had since been twice re-elected. He was next requested to turn soldier, and take charge of the University Rifle Company. A few years afterwards he received the degree of D.C.L. from the University of Oxford. His portrait had previously been placed upon the walls of the College of Physicians, and now some friends obtained the placing of his bust in the hall of the University, and presented a duplicate of the bust to his family. Then he was elected President of the Royal Society, and this was followed by the quite unexpected honour that her Majesty had conferred upon him in making him a baronet. In looking over the records of the University, he found that the honour paid him on that occasion was unprecedented. Of the many professors, only one, Professor Jameson, survived his first appointment fifty years, and in that case it was only by twenty days, and the professor's health was so feeble as to preclude any such compliment as that they had paid to him. Sir Robert attributed his success to the fact that he had always resolved to attend to the particular duties of his office, whatever they might be.

During the evening a telegram was received to the effect that "The Vice-Chancellor and other friends at Cambridge drink to the health of Professor Sir Robert Christison, Bart."

The Pharmaceutical Journal.

SATURDAY, MARCH 2, 1872.

Communications for this Journal, and books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

CINCHONA CULTIVATION IN INDIA.

WE have been favoured with copies of two important reports on this subject. One, which will be found at p. 705, from J. BROUGHTON, Esq., Government Quinologist at Ootacamund, contains the results of analytical researches made with the object of ascertaining a variety of details requisite to be known in reference to cinchona culture, such as the conditions affecting the yield of alkaloids, etc. The other report is by J. ELIOT HOWARD, Esq., in answer to certain questions addressed to him by the SECRETARY OF STATE FOR INDIA: this report, which we purpose printing next week, deals mainly with the question as to "the species which is likely to produce the most remunerative bark for sale in the London market," commenting on some of the results obtained by Mr. BROUGHTON, and illustrating the importance of selecting proper species for cultivation.

HYDROCYANIC ACID.

ATTENTION has been repeatedly directed to the variations to which pharmaceutical preparations of hydrocyanic acid are subject. The causes of diminution of strength are various. In the first place, hydrocyanic acid is an exceedingly volatile substance, and therefore samples contained in bottles which are kept only partially filled, and are opened half-a-dozen times a day, must very rapidly deteriorate from this circumstance alone. Hydrocyanic acid is also readily decomposed when kept dissolved even in pure water, whilst the presence of even a trace of alkali establishes very rapid destruction, ammonia and an alkaline formate being produced. To avoid chance impurity of this kind, from imperfectly-rinsed bottles or other source, it is commonly the practice to add a minute quantity of sulphuric acid, which is found to retard this decomposition very materially. An excessive quantity of acid also promotes the same kind of change, and must therefore be avoided. The chemical reaction just described is accompanied by the deposition of a brown insoluble substance.

It is obvious from what has just been pointed out, and from the experiments of Dr. TILDEN, Mr. GILMOUR and others published in this Journal, that the hydrocyanic acid commonly employed in dispensing is far from what it should be. To remedy this as far as possible, the practice should be adopted of setting aside for the dispensing counter a small quantity, which should be entirely renewed at least once a week, and the residue, if any, thrown away. Numerous observations have shown that when the bottle is frequently opened, the strength of the acid cannot be depended upon for any longer period.

IN the *Journal of Materia Medica* for October is recorded a case, in which poisoning by strychnia was successfully treated with bromide of potassium. The patient, who was a farmer, had eaten some cakes made from flour with which a considerable quantity of strychnia had been mixed. When first seen by the medical man, the skin was cold and livid, there was great dyspnœa, the jaws were fixed, the lips retracted, and the teeth covered with frothy saliva. An ounce of bromide of potassium was dissolved in a cup of water, and the mouth being forced open, one half was administered directly, and the remainder in smaller doses for an hour or so afterwards. Under the influence of the bromide the symptoms subsided, and had nearly disappeared twenty-four hours afterwards. A piece of one of the cakes given to a dog produced death in twenty minutes.

AT a recent meeting of the Association of Medical Officers of Health, Dr. ALFRED J. BERNAYS read a paper "On the Precautions which should surround Toxicological Investigations in a Court of Law." In discussing the method of proceeding in cases of suspected poisoning, he expressed an opinion that the necessary analyses should be made by a jury of experts, which should consist of the local physician, a chemist with a medical degree and a practising chemist, who should make a report in writing to be published before the trial. He also entered a vigorous protest against the system of confining all such analytical work to two or three men, however eminent they might be, and said that selection should be made from a wider sphere.

AMONGST the public bodies that were honoured by invitations to participate, through their officials, in the Thanksgiving Service at St. Paul's Cathedral, on Tuesday last, was the Pharmaceutical Society of Great Britain. The Society was on that occasion represented by the President, Mr. A. F. HASELDEN, F.L.S., and the Vice-President, Mr. G. EDWARDS.

AT the Evening Meeting of the Pharmaceutical Society on Wednesday next, a paper by Dr. DYCE DUCKWORTH will be read on "The Pharmaceutical Preparations of Ipecacuanha," and a note from Dr. DE VRY on "*Cinchona caloptera*, Miq."

WE are requested to state that the Secretary of the Pharmaceutical Society has received from the Treasurer of the Chemists' Ball Committee the sum of twenty guineas for the Benevolent Fund. We are glad to congratulate the Committee on the success of their labours.

Transactions of the Pharmaceutical Society.

EXAMINATIONS IN LONDON.

February 21st, 1872.

MAJOR EXAMINATION.

Six candidates were examined; of these, *four* failed. The following *two* passed, and were declared duly qualified to be registered as

PHARMACEUTICAL CHEMISTS.

Pratt, Henry James..........Thirsk.
Goodliffe, George ....Hammersmith.

These names are arranged in order of merit.

PRELIMINARY EXAMINATION.

The *Certificate of the College of Preceptors* was received from the undermentioned in lieu of this Examination:—

Rowland, Edward Edisbury ..Liverpool.

February 21st and 23rd, 1872.

MINOR EXAMINATION.

Thirty-one candidates were examined; of these, *six* failed. The following *twenty-five* passed, and were declared duly qualified to be registered as

CHEMISTS AND DRUGGISTS.

*Horrod, Thomas Samuel......Lincoln.
*Parson, Henry James ....Birmingham.
*Rutter, Thomas Dixon ......Scarborough.
*Badcock, Daniel ....Barnard Castle.
*Jones, William ....Louth.
*Rigby, James ....Liverpool.
*Griffith, Richard William Smith. Southampton.
*Green, Vittery ....London.
*Pank, Philip Durrell ....North Walsham.
George, John ....Kidderminster.
Langham, Henry John ......Diss.
Equal. { Ashworth, Amos ....London.
Equal. { Griffith, John ....Hastings.
Cadoux, Samuel Henry ......Colchester.
Cowdery, Frederic ....Reading.
Downes, Charles Hagger ....London.
Greatrex, Thomas James ....London.
Bolton, Charles Alfred ......Nottingham.
Edwards, Thomas ....Newport, Monm.
Equal. { Davies, Peter Hughes........Peterborough.
Equal. { Newbery, Albert Edward ....Exeter.
Clark, John ....Dumfries.
Hopkinson, Thomas..........Grantham.
Luke, Richard Samuel ......Plymouth.
Cox, Edwin Joseph ....Havant.

These names are arranged in order of merit.

BOTANICAL PRIZE FOR 1873.

A Silver Council Medal is offered for the best Herbarium, collected in any part of the United Kingdom between the first day of May, 1872, and the first day of June, 1873; and should there be more than one collection possessing such an amount of merit as to entitle the collector to reward, a second prize, consisting of a Bronze Medal, and also Certificates of Honour and Merit, will be given at the discretion of the Council. In the event of none of the collections possessing such an amount of merit as to warrant the Council in awarding Medals or Certificates, none will be given.

The collections to consist of Flowering plants and Ferns, arranged according to the Natural System of De Candolle, or any other natural method in common use, and to be accompanied by lists, arranged according to the same method, with the species numbered.

The collector to follow some work on British Botany (such as that of Babington, Hooker, or Bentham), and to state the work which he adopts. The name of each plant, its habitat and the date of collection, to be stated on the paper on which it is preserved.

Each collection to be accompanied by a note, containing a declaration, signed by the collector, and certified by his employer, or a Pharmaceutical Chemist to whom the collector is known, to the following effect:—The plants which accompany this note were collected by myself, between the first day of May, 1872, and the first day of June, 1873, and were named and arranged without any assistance but that derived from books.

In estimating the merits of the collections, not only will the number of species be taken into account, but also their rarity or otherwise, and the manner in which they are preserved; and should a specimen be wrongly named, it will be erased from the list.

The collections to be forwarded to the Secretary of the Society, 17, Bloomsbury Square, on or before the first day of July, 1873, indorsed "Herbarium for Competition for the Botanical Prizes." After the announcement of the award, they will be retained one month, under the care of the Curator of the Museum, for the inspection of persons connected with the Society, and then returned to the collectors, if required.

No candidate will be allowed to compete, unless he be an Associate, Registered Apprentice, or a Student of the Society, or if his age exceed twenty-one years.

* Passed with honours.

FREE ADMISSIONS TO THE ROYAL BOTANIC SOCIETY'S GARDENS, REGENT'S PARK.

The following pupils of the class of Botany and Materia Medica, in the Pharmaceutical Society, after examination by Professor Bentley, have had, at his request, free admission to the gardens in Regent's Park given to them by the Secretary of the Royal Botanic Society:—

Mr. Joseph Henry Aldridge.	Mr. Frederick W. Jasper.
,, Daniel Badcock.	,, James Stephen Kent.
,, William Brewster.	,, Edward Lewis.
,, Edward L. Cleaver.	,, John Thomas Lincoln.
,, Arthur B. Cortis.	,, Robert Mills.
,, Robert Higgins Davies.	,, Edward Rammell.
,, Henry Edmonds.	,, Charles H. Russell.
,, George P. Fairman.	,, William A. Shenstone.
,, John Joseph Faraker.	,, Edwin Tebbutt.
,, Alfred W. Green.	,, Edmund John Thring.
,, Frederick J. Hanbury.	,, Thomas Wm. Townley.
,, E. Grindle Hogg.	,, Richard Trist.
,, James M. Hucklebridge.	,, Joseph Walker.

The above names are ranged in alphabetical order.

These orders will admit to the Gardens upon any ordinary day in the months of March, April and August, from 9 A.M. till 1 P.M.; and in May, June and July, from 7 A.M. till 1 P.M. Such admissions, therefore, afford every facility to those who possess them, of making themselves practically acquainted with plants.

Provincial Transactions.

NOTTINGHAM AND NOTTS CHEMISTS' ASSOCIATION.

The Second General Meeting of the session was held in the Society's Rooms, Britannia Chambers, on December 20th, 1871; the President, Mr. J. H. Atherton, in the chair.

The minutes were read and confirmed.

The President presented to the Society, on behalf of Messrs. Morson and Sons, London, a beautiful collection of alkaloids and chemical preparations for the museum. The specimens were exhibited on the table, and were very much admired. A cordial vote of thanks was accorded to the donors, on the motion of Mr. W. H. Parker, seconded by Mr. Rayner.

The prizes in connection with the classes on Inorganic Chemistry were awarded to the successful candidates.

Prizes.—Mr. Bothamley, Mr. De Pease and Mr. Goddard.

Certificates of Merit.—Mr. Symons, Mr. Archer, Mr. Bolton, Mr. Norweb, Mr. Jenkins and Mr. Dixon.

The paper of the evening, by Mr. Rayner, entitled "Ourselves as Pharmacists," was unavoidably postponed.

The Third General Meeting of the Association was held in the Society's Rooms, Britannia Chambers, on Tuesday evening, February 2nd; the President, Mr. Atherton, in the chair.

The minutes of the previous meeting were read and confirmed, and the following donations announced:—The *Pharmaceutical Journal*, the *Chemist and Druggist*, the *Chicago Pharmacist* and the *Year-Book of Pharmacy*.

Mr. Oscroft Ilkeston and Mr. Margett Eastwood were elected members of the Society.

The President made an appeal to the Society on behalf of the English Contribution towards the re-establishment of the College of Pharmacy, Chicago, destroyed during the lamentable fire in that city. Great sympathy was expressed and a collection made, which was duly forwarded to Dr. Attfield, the Hon. Secretary of the Fund.

Mr. Rayner read a paper on "Ourselves as Pharmacists." After the discussion thereon, a vote of thanks was accorded to Mr. Rayner.

The Annual Supper of the Association was held at the 'Maypole Hotel' on Tuesday, January 16; Mr. Atherton, the President, in the chair. There was a very large attendance.

After the usual loyal toasts had been duly honoured, the President called upon the members to drink to the success of the Nottingham and Notts Chemists' Association.

The other toasts given were, "The Medical Profession," "The Pharmaceutical Society and Council," "The Lecturers, Past and Present," "The President," "The Vice-President and Council of the Association," "The Secretary," "The Treasurer," and "The Ladies."

LIVERPOOL CHEMISTS' ASSOCIATION.

The Eighth General Meeting was held on February 15th; Mr. E. Davies, F.C.S., in the chair.

Mr. Thomas Kirby was elected an associate.

The following donations were announced:—current numbers of the *Pharmaceutical Journal;* the *New York Druggists' Circular;* and the "Proceedings of the Liverpool Architectural and Archæological Society," Oct. Nov. 1871.

Mr. John Abraham read the following paper on the

Preparation of Liquor Potassæ.

In the Pharmaceutical Journal for March, 1861, is an article by Professor Redwood on the preparation of liquor potassæ. The object is to obtain a solution of potassa free from colour, from lime, and from carbonic acid, and of definite strength. It is further desired that these objects shall be obtained in the most ready manner, but the means of obtaining such a solution are not quite so obvious as might at first be supposed, and the details of the process have varied from time to time, and in different Pharmacopœias. In all, carbonate of potash with lime or hydrate of lime, and water, are the ingredients. Lime having a greater attraction for the carbonic acid than potash has, abstracts it from the solution of carbonate of potash. But if this solution is too strong, the whole of the carbonic acid is not abstracted. According to Mitscherlich, as quoted by Gmelin, 50 parts of water are required to 1 of carbonate of potash, but I have found nothing to warrant the assertion. In all the Pharmacopœias, before the publication of the first British Pharmacopœia, quicklime was ordered to be used. But quicklime is very far from being of uniform quality, and Professor Redwood recommended that the lime should be slaked, the grosser impurities removed by sifting, and a definite weight of the hydrate employed. This was a very decided improvement, and it was adopted in succeeding Pharmacopœias. The Professor, however, further recommended that the preparation should be made entirely in the cold, and he gives a formula accordingly, which he thinks satisfactory; but this suggestion was not adopted, either in the first British Pharmacopœia or in the second, which was edited by himself. And I may say that I remember to have tried it, and that I did not find it satisfactory. But I expect that one reason for that is to be found in the fact that the solution of carbonate of potash was directed to be poured into the milk of lime. The first and second British Pharmacopœias direct that the decarbonating agent shall be added gradually to the solution of the carbonate. This is a material variation, by which the hydrate of lime first added becomes more fully carbonated, and leaves the remaining hydrate of lime to act energetically upon the remaining carbonate.

The directions of the London Pharmacopœia ordered the use of boiling water, but involved no subsequent boiling. Those of the British Pharmacopœia direct the ingredients to be boiled in an iron pan. Now, this will be found by most operators, I think, extremely objectionable, and I find it to be unnecessary. Operating on seven gallons in a steam pan, the amount of evaporation and consequent strength is extremely uncertain; although, of course, careful operators will test and dilute. Even if the whole of the carbonic acid is removed, which, I think, is not always the case, the liquid is very liable, when made in an iron pan frequently applied to other purposes, to be discoloured.

I have, therefore, tried a modification, which I find to be perfectly successful, whether the quantities operated on be seven gallons or one pint, and the convenience of which will, I think, be generally appreciated. I put the carbonate in a stoneware vessel, add the water *boiling*, then, by little and little, the hydrate of lime, stirring during half an hour. I find that the solution may, after a short time, be poured off with very little loss, and that to the tests of lime water and oxalate of ammonia it does not exhibit the presence of carbonic acid or of lime.

I find also that the Pharmacopœia quantities, used in this manner, furnish a solution identical with, or but a little stronger than, the standard of the Pharmacopœia. On the first occasion, making seven gallons, the sp. gr. was exactly right, 1·058. On a subsequent occasion, operating on a pint, the sp. gr. is 1·0615. This gives, as I now show you, no precipitate with lime water or oxalate of ammonia. Using a substance so hygrometric as carbonate of potash, a uniform result cannot be expected; but, although, as I have said, a careful operator will test the product, it is a great advantage in a Pharmacopœia formula, that it is, within narrow limits, necessarily of the standard strength.

A portion prepared by Mr. Abraham in the manner he described was afterwards carefully tested and found perfectly free from any trace of carbonic acid or of lime.

Mr. James Armstrong read a paper on "Animal Charcoal." He commenced by alluding to the importance of the subject, arising from the great tendency of the sugar-refiners of the present day to look to chemists for aid to conduct their business on scientific principles, and expressed an opinion that the application of animal charcoal for sugar refining was yet in its infancy. He believed that a careful study of the subject by an analytical chemist, with the view of using it in a more economical manner, or of partly replacing it by some other substance, would be well repaid. He next gave a description of the process of carbonizing the bones, and referred to the results of some analyses that he had made of the commercial article. The absorbent power he had found to vary considerably in different samples, and it required some experience to determine which were the best for the refiner's purposes. Chloride of sodium is always found in new char; this was removed by two or three careful washings with boiling water, which also carried off some of the ammonia and calcium that were present. Before being fit for use the char had again to be burned. The process of decolorization was next described, and various practical details of the process explained and commented on, and the effects of passing the saccharine liquor over animal char illustrated by specimens. The cleansing of the contaminated char—generally by allowing hot or cold water to pass through it for some hours—was an important process, but it was found that the char gradually lost its absorbent properties. It was very necessary that the foreign matter should be removed, as its presence during the reburning was very injurious to the char, and the present method was open to much improvement. The reburning was then described, some of the difficulties attending it referred to, and the results attained shown by a table of results of analyses of reburned char obtained from different refineries. In consequence of this deterioration in its absorbent powers, the author considered it would be advisable for the refiner, in order to secure the most satisfactory results, to have the char he uses tested at least once a month.

After the reading, Mr. Armstrong showed a model of Messrs. Buchanan and Vickes's kiln for burning the charcoal, and explained its advantages over the ordinary kiln. Specimens of charcoal new and burnt, both foreign and English, and also sugar liquors before and after filtration, were exhibited.

A vote of thanks to Mr. Armstrong concluded the business of the evening.

LEEDS CHEMISTS' ASSOCIATION.

The Fifth Meeting of the Session was held in the Library, on Wednesday, February 21st, 1872; the President, Mr. E. Brown, in the chair.

The minutes of the former meeting having been read and confirmed, the Librarian reported that he had received the Proceedings of the British Pharmaceutical Conference, 1871, as a donation to the Library, from the Committee, and it was resolved that the thanks of the Society be given to the donors.

The President read a letter he had received from Mr. Radley, of Sheffield, referring to the course adopted by the Council of the Pharmaceutical Society, in giving assistance to Provincial Societies, and invited the opinion of the members present upon it. He was exceedingly pleased to find that their esteemed friend Mr. Reynolds was present that evening, and he had no doubt Mr. Reynolds would explain any question which might arise in connection with this subject.

Mr. Reynolds regretted that in consequence of indisposition he had not been present at a greater number of meetings, and was glad to find that there was such a good attendance, which was no doubt due to Mr. Abbott's well-earned reputation. He had also received a communication from Mr. Radley upon the subject introduced by the President, and would have pleasure in giving an explanation of the action of the Council of the Pharmaceutical Society in this matter if it were decided to discuss the question.

A short discussion took place, and as it appeared to be a subject requiring careful consideration, it was resolved to refer Mr. Radley's letter to the Committee.

Mr. James Abbott then read the paper of the evening on "The Germ Theory."

The Lecturer briefly reviewed the history of spontaneous or equivocal generation, detailing the experiments of Schwann, Pouchet, Pasteur, and Bastian. The question can scarcely be said to have been solved by M. Pasteur, if Dr. Bastian's experiments are reliable; it becomes, therefore, a question for future experimentalists to determine whether bacteria are present in recently prepared vegetable infusions, and resist increased temperature, or whether they are formed *de novo*. Every one who has experimented in this direction acknowledges the difficulty of determining whence these small organisms, bacteria, microzyme, etc. come.

With regard to disease germs, undoubtedly, Dr. Beale is correct; they are living organisms entering the circulation, of which we have abundant proof in vaccine lymph, syphilis, hydrophobia, *post-mortem* wounds, etc. The author considered that all noxious gases are injurious to health, and supposed they poisoned the system chemically. He thought that proof was wanting to show that sewer gases are originators of disease germs, which is a popular belief. Zymotic diseases are propagated by offcasts of living matter from infected persons being drawn into the circulation, where they rapidly multiply, doing the dreadful but sure work of destruction.

Referring to disinfectants, the author considered carbolic acid had been much over-estimated; it acted as an antiseptic, but was inferior in its action to chromic acid. With the many preparations known to be useful for the purposes of disinfection, it is necessary to make a selection according to the requirements of the case.

Mr. Reynolds thought the subject was so full of interest that it would be impossible to discuss the many points touched upon by the lecturer in the limited time we had at disposal, and he hoped Mr. Abbott would divide the subject, and give us another paper. He had pleasure in proposing that the best thanks of the meeting be given to Mr. Abbott.

Mr. Smeeton quite agreed with Mr. Reynolds, that it would be impossible to consider the many questions involved in this excellent paper, and proposed that the discussion be adjourned to a future meeting.

Mr. E. Thompson cordially supported the resolution, and also the suggestion of Mr. Smeeton, which he hoped would be agreeable to Mr. Abbott.

The resolution was carried unanimously.

In acknowledging the vote of thanks, Mr. Abbott placed himself at the disposal of the Committee, and would be glad to take up either the whole or one part of the subject whenever the Committee decided to hold a meeting for the purpose.

MANCHESTER CHEMISTS' ASSISTANTS' ASSOCIATION.

The Ninth Ordinary Meeting of the session was held at Mitre Chambers, on February 27th; the President in the chair; at which a paper on "Elementary Botany" was read by Mr. Clarke.

After a few introductory remarks, the reader endeavoured to show that, in order to make the acquisition of botanical knowledge pleasant as well as profitable, we should first cultivate a taste for flowers, and gain a knowledge of the plants commonly met with, and a general knowledge of the characteristics of Natural Orders.

He also explained vernation or prefoliation, showing living specimens to illustrate the several varieties of leaf-arrangement in the leaf-bud.

The next meeting is arranged for March 5th, when a paper on "The Salts of Mercury and Iron" will be read by Mr. Cooper.

Proceedings of Scientific Societies.

SOCIETY OF ARTS.

The Study of Economic Botany, and its Claims Educationally and Commercially Considered.*

BY JAMES COLLINS, F.B.S. EDIN.

Curator of the Pharmaceutical Society's Museum.

(*Continued from page* 695.)

Let us for a few minutes direct our attention to the two duties of a merchant—those of extending and improving present and opening up fresh sources of supply. No systematic efforts are made by our merchants, as a whole, to search the earth for its treasures. There are, happily, a few, though very few exceptions to this rule. "The noblest and vilest of substances, gold and guano," as Professor Wilson well expressed it, "are stumbled upon hap-hazard. With a kind of mad patience, we go, year after year, to the same source for products, without trying to ascertain if they are present elsewhere, and we are daring and reckless enough unceasingly to scour strange lands and seas. But of what avail is all this, if we only guess at the value of the strange objects we encounter, without a thought about taking action to ascertain its possible utility?" What a gain to the world is a new land carefully explored, and its products prominently brought to notice! Many new lands are looked upon in the same light in which the whole of Africa was formerly, as—

> "Barren sand,
> Where nought can grow, because it raineth not;
> And where no rain can fall to bless the land,
> Because nought grows there."

But a mere glance at the 'Flora of Tropical Africa,' now publishing, reveals such floral riches as to require no prophetic foresight to predict for it a great commercial future.

In exploring new lands, sufficient attention is not paid to this question. The chief aim of exploration is the increase of geographical knowledge; but every science should have a present and direct, though it always has a future and indirect, practical end, that of bringing the new lands within the pale and under the beneficial influences of civilization. Every such explorer is a pioneer of commerce. But how much sooner would such a result be brought about if the traveller always used his best efforts to collect all the information respecting products and specimens of the products themselves on every possible occasion, and thus hastened the practical results of his toils and hardships? On all our exploring expeditions, there should be an economic botanist appointed, to give his special attention to this very important practical inquiry. But it is frequently thought sufficient to collect strange objects, and little attention is given to those objects which are likely to prove of practical value. This assuredly should not be.

Residents abroad can be made the means of no end of good. Often at their very doors are materials in great abundance, which could be utilized in our own country if the requisite knowledge existed to rightly direct inquiries. But it often happens that, where products are sent home, for lack of proper information accompanying them, no result is achieved. How different it would be if that same correspondent had received a preliminary training, even of an elementary character? But much of this would be remedied if proper instructions were sent out. Often, when appeals for information to residents or intended residents in a foreign country are made, the answer is, "Give me instructions what to look for, and what kinds of samples should be sent." In the case of one product alone, namely, india-rubber, to which I have paid much attention, I have frequently been appealed to for instructions as to what kind of specimens should be collected, and how collected; and at the request of Mr. Silver, who takes a warm interest in everything both scientifically and commercially connected with the subject, I wrote a series of instructions purposely for his correspondents abroad. But such things require to be done systematically, and on a large scale. Much good would accrue to commerce if general instructions, or instructions drawn up to suit each country, were printed and circulated amongst our consuls and other public and private individuals abroad.

Every one who has had opportunities for observing the commerce of this country, must have noticed from time to time various substances, forwarded by sanguine collectors or merchants, who perchance have seen the substance used by the natives of the place, or observed that it existed in great abundance, the object being to ascertain if they were of any use, or, as it is termed, to "try the market." But amid the press of other business, yielding a certain present money value, or in the presence of powerful rivals, in the face of which it may or may not be of value, it is almost impossible to obtain any recognition, and is speedily lost sight of and forgotten,—a result enough to damp the ardour of most persons. There are many points which have to be considered in sending a new substance, and have to be provided for before success can be obtained. Some substances may be useful, and in great abundance, but they would cost more than their value to bring them to a market. Others, again, are of sufficient value to more than repay the cost of transport from a foreign port to this country, but from the absence of carriage, and the dearth or absence of labour, they cannot be utilized. Many valuable timber-trees labour under this disadvantage. Efforts should be made in such cases to remove, if possible, these drawbacks, by placing such substances under conditions more favourable. Even where there is no difficulty in the transport, and no dearth of natives, the greatest difficulty is experienced in getting the natives to stir an inch, or undertake any labour, unless their own sweet will inclines them, or their wants, often more artificial than natural, impel them. It is almost a proverb amongst traders that wants, or even vices, have to be created, in order to furnish incentives to labour beyond that required in order to obtain the few yards of European cloth which they covet, to substitute for that of their own manufacture, or that the produce and shade of their own vine and fig-tree supply them with. Other substances, again, are sent, for which there is no immediate or present demand; and though they may be better suited for a purpose than one in use, yet the difficulty of establishing a new trade, and bringing about a substitution, is so great with a people so conservative and strongly prejudiced as we are, that rarely does the original importer meet with anything but loss. Deficiency of information, however, does more than anything else to injure and retard the introduction of a new substance. The difficulty of obtaining information respecting a new substance is very great. Often the only information sent amounts to this, "is it good for anything?" and the specimen itself has been selected with such an absence of judgment, and is often of so fragmentary a cha-

* Read on Wednesday Evening, Feb. 14.

racter, that to attempt to ascertain its source is almost as hopeless a task as endeavouring to find out a person's name by a lock of his hair. In sending economic products, dried specimens of a branch of the plants producing them, with the leaves, flowers and fruit attached, also specimens of the bark and wood, also specimens of the leaves, flowers and fruit, preserved in spirit, should be forwarded. And these specimens, together with the product, should all be obtained from the same identical plant. This is especially necessary when the product is a gum or other substance having no organic structure. Great care should be taken to append the correct vernacular names, as vernacular names properly applied are of material assistance in the recognition of the substance. Vernacular names, however, though they are undoubtedly the economic botanist's best friend, yet, if great care is not taken, prove a constant source of error. A name belonging to one substance is often applied to others, from a real or fancied resemblance, or from ignorance. This is especially the case in colonies. A person leaves his native country to make his home in another, and carries with him the old scenes and associations vividly impressed on his memory, and to perpetuate them he names the plants around him after those of his native heaths and hedgerows, making a plant do duty for his native violet, however far removed it may be in other respects. But let not my remarks be taken in depreciation of vernacular names; I value them highly, as my words elsewhere will show;* but what I wish to insist on here is that great care should be taken in bestowing them accurately, and that it is not sufficient to find the vernacular name of a product in connection with a botanical name of the plant in any work, to establish the identity; that, in short, they are but a means to an end, not the end of inquiry itself.

The geographical source of a product should always be accurately indicated. Even at the present time the localities where some of our utilized substances are obtained are only guessed at, and this arises from various causes. Many of the ports of shipment—Singapore may be taken as a good illustration—are only *entrepôts* for neighbouring districts or countries, and a product may, before it arrives there, have been brought a long distance from the interior, or by native craft from another country. Or, again, a ship may call at several ports, and only be "entered" here as from the last port she quitted; or she may break bulk from some cause, or the article may only be a reshipment. I remember an amusing instance of reshipment of this kind. Seeing in the 'Customs Bill of Entry' a parcel of india-rubber entered as coming from Australia, and having heard from various sources encouraging accounts of Australian rubber, I naturally was very anxious to see this, the first importation. After a long series of inquiries at the Custom-house, brokers and docks, judge of my disappointment when I found it consisted of "returned stores," old india-rubber tubing, which ultimately found its way to a marine-store dealer's. These are a few points which require attention, in order to give merchants every facility of judging of the value of new products, and at the same time of increasing our knowledge.

But one of the greatest aids to our merchants and manufacturers would be a good trade or commercial museum. Here the pharmacist could see grouped together all the medicinal substances, and could select and could judge whether any yielded an analogous extractive principle and the same action as one of which the supply was deficient; the cabinet-maker could judge of the colour and direction of the grain of a wood; the perfumer of the odour of a substance; the shipbuilder the tenacity of a wood and its power of resisting atmospheric influence; and the dyer of the dye he is in search of; and the fibre merchant and the paper manufacturer of the substances most likely to yield them the best results. Thus each one would have presented to his eye the substances in which he felt the most interest, and all grouped together.

Professor Edward Solly, in his lecture delivered before the Society of Arts, on the "Scientific Results of the Exhibition of 1851," has the following very pertinent remarks on this question:—

"If you were to place before any manufacturer specimens of all the substances which could be employed in his particular manufacture, and if you could tell him from whence each could be procured, its cost, the quantities in which he could obtain it, and its physical and chemical properties, he would soon be able to select for himself the one best suited for his purpose. This, however, has never happened in relation to any one art; in each case the manufacturer has had to make the best of the materials which chance or accident has brought before him. It is strange and startling, but, nevertheless, perfectly true, that even at the present time there are many excellent and abundant productions of nature with which not only our manufacturers, but, in some instances, even our men of science, are wholly unacquainted."

The truth of these remarks will be felt strongly by any one who takes the trouble to examine any of the great divisions of raw material. He will obtain tolerably complete information respecting most of those substances which are known to trade and commerce, but of the greater number of those not known to the broker he will learn little or nothing. Men of business do not feel the want of such knowledge, because, in the first place, they are ignorant of its existence, and, secondly, because they do not see how it could aid them in their business; and if it should happen that an enterprising manufacturer desires to learn something of the cultivation and production of the raw material with which he works (or desires to work) he generally finds it quite impossible to obtain any really sound and useful information.

An inseparable part of such a museum would be a chemical laboratory. To such a museum specimens of every new substance should be sent, in order that they might be examined botanically and chemically, and their value proximately determined. For such an examination those who are directly interested in the substance would not object to pay a fee. These researches would not come between the importer and his profits. Such a museum, when its objects became known, would meet with speedy recognition and support.

Another question, which has a very important bearing on economic botany under its commercial aspect, is the cultivation of those economic plants not already cultivated, and their acclimatization in localities where the various conditions which are so many elements of success are more controllable than in the native habitats. We are so fortunately situated that our territorial possessions have a geographical range amply sufficient to satisfy the climatic desiderata of every plant. It may be received as an axiom beyond all controversion, that spontaneous forest products cannot be depended on for regular supply, and that, sooner or later, recourse must be had to cultivation.

What a complex question is civilization, and its modern representative colonization, even if viewed in their connection with forest products? If we view a primeval forest, where the influence of man has never been felt, where it has the appearance so well portrayed by Tennyson:—

"The mountain wooded to the peak, the lawns
And winding glades high up like ways to Heaven,
The slender cocoa's drooping crown of plumes,

* * * *

The lustre of the long convolvuluses
That coiled around the stately stems, and ran
Ev'n to the limit of the land,"

* Seemann's 'Journal of Botany,' vol. vii. p. 361.

And where the giants of the forests

> "yclad with sommer's pride
> Did spread so broad, that heaven's light did hide,
> Nor perceable with power of any starr."

And nature is marked everywhere by mutual relations and adaptations, thus producing a beautiful harmony, which on the approach of man is changed into discord. His steps are marked by the restriction or destruction of indigenous forms of life, vegetable and animal, which are supplanted by others of foreign origin. Of the various stages of man's social progress, the pastoral and agricultural conditions are the most destructive to forest products. The sound of the axe is heard; fire encircles the trunks of many a tree, for fire is said to improve the soil; and a clearing is made, which is soon covered with a different and frequently aggressive form of vegetation. Soon, through slovenly husbandry, the first portion of land is exhausted, and the process of destruction is repeated by the removal of further portions of forest which hem them in. The spontaneous products formerly at their very doors have now to be sought far away, or, if they have representatives nearer, they are reduced to struggling weeds. Of this tenacity of locality, and degradation, as it were, under man's influence, I had a remarkable instance given me by a traveller. He had been endeavouring to find the source of a vegetable product, and had thoroughly examined the outskirts of the settlement where he was staying; but the only plant that he deemed, from its generic position, could yield it, existed only as a weak growing tender climber, and it was only after seeing the plant fully developed, away from the influence of man, that he could verify his surmises.

As an illustration of the truth of the axiom, that we cannot depend upon spontaneous forest growth for a regular and lasting supply of any product in considerable demand, I may refer to two important substances, viz. india-rubber and cinchona. In the one case, the present sources of supply are being rapidly exhausted through the ignorance of native collectors; and, in the other, the resources of the science of economic botany have placed us in a far higher position than we were, not only rendering us independent of native collection, but promising much more plentiful supplies.

Through the kindness of a correspondent, M. Paul Lévy, who is practically acquainted with the subject, I am enabled to give you an account of the collection of india-rubber, which will serve very well to convey a general idea of how forest products are collected, and also to illustrate a few points to which I wish to draw your attention:—"To those who are unacquainted with the forests of intertropical America, the obstacles there met with are incomprehensible. The traveller finds an inextricable confusion of vegetation, covered with creepers, through which a day's hard labour will not secure the advance of a hundred feet. Now, a straggling and slimy marsh, out of which he is only with difficulty able to extricate himself; next, an insurmountable ravine, which it is necessary to flank, thus tripling the amount of labour. Add to these the perpetual fear of wild beasts, and the frequent want of water, and then judge of what passes in the mind of the poor *hulero*, who, after many of such risks and much labour, arrives at the foot of a tree he has seen from afar, and discovers it is not what he seeks. Besides the qualities required in a *hulero* to enable him to find his way in an obscure forest, it is necessary for him to serve an apprenticeship to learn how to properly bleed a tree; that is to say, to extract as much milk as possible from the tree without killing it. With respect to killing it, however, he is not at all particular. Near the towns, all the trees along the roadsides are marked by scars made by amateur *huleros*, and present strange, exaggerated forms. The forests are full of these attempts, by which, in ten years, the most beautiful trees within a circle of many leagues of the rancho of a would-be Indian *hulero* are frequently destroyed. It is to this cause alone that the blighted appearance of the forests of the inhabited part of Nicaragua is due. The cut with the machete, to be successful, must penetrate at one blow through the bark without touching the wood, otherwise the tree is destroyed; and; from the difficulty of handling the machete, and the carelessness of the *huleros*, caoutchouc trees are destroyed with fearful rapidity. The *hulero*, having collected his rubber, returns to the towns to dispose of it, where he is subject to great wrongs from the small traders, nearly universally a very low class. When the price has at last been agreed upon, the *hulero* finds that the greater portion is already owing for his outfit and spirit score, and frequently the trader does not part with him till the small balance is expended in debauchery and drink. Full of revengeful feeling, the cheated, hardly-dealt-with *hulero* departs, and destroys all the trees he meets with on his road. The contract between a party of *huleros* and an agent is made after quite a patriarchal fashion. They regard each other seriously, strike hands, and the bargain is completed. It is to the agent that application is made to secure the active and armed resistance of the *huleros* in case of a revolution. He generally succeeds in engaging them in the civil war by means of a good bounty, a high rate of pay, a considerable equipment, and a more handsome dress than that of the other soldiers."

(*To be continued.*)

Parliamentary and Law Proceedings.

A BILL TO AMEND THE LAW FOR THE PREVENTION OF ADULTERATION OF FOOD AND DRINK AND OF DRUGS.

(Prepared and brought in by Mr. Muntz, Mr. Whitwell, and Mr. Dixon.)

Whereas the practice of adulterating articles of food and drink and drugs for sale, in fraud of her Majesty's subjects, and to the great hurt of their health and danger to their lives, requires to be repressed by more effectual laws than those which are now in force for that purpose:

Be it therefore enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:

1. Every person who shall wilfully admix, and every person who shall order any other person or persons to admix, with any article of food or drink, any injurious or poisonous ingredient or material to adulterate the same for sale, and every person who shall wilfully admix, and every person who shall order any other person or persons to admix, any ingredient or material with any drug to adulterate the same for sale, shall for the first offence forfeit and pay a penalty not exceeding fifty pounds, together with the costs attending such conviction, and for the second offence shall be guilty of a misdemeanour, and be imprisoned for a period not exceeding six calendar months, with hard labour.

2. Every person who shall sell any article of food or drink with which to the knowledge of such person any ingredient or material injurious to the health of persons eating or drinking such article has been mixed, and every person who shall sell as pure and unadulterated any article of food or drink, or any drug which is adulterated or not pure, shall for every such offence, on a summary conviction of the same before two justices of the peace at petty sessions in England, and in Scotland before two justices of the peace in the justice of the peace court, or before the sheriff substitute of the county, or before justices at petty sessions or a divisional justice in Ireland, forfeit and pay a penalty not exceeding twenty pounds, together with such costs attending such

conviction as to the said justices shall seem reasonable; and if any person so convicted shall afterwards commit the like offence, it shall be lawful for such justices of the peace to cause such offender's name, place of abode, and offence to be published, at the expense of such offender, in such newspaper or in such other manner as to the said justices shall seem desirable.

3. And be it enacted that the Pharmacy Act, 1868, and the Act twenty-third and twenty-fourth Victoria, chapter eighty-four, for preventing the adulteration of articles of food and drink, shall be deemed to be incorporated in this Act.

4. In the city of London and the liberties thereof the commissioners of sewers of the city of London and the liberties thereof, and in all other parts of the metropolis the vestries and district boards acting in execution of the Act for the better local management of the metropolis, in England and Ireland the court of quarter sessions of every county, and the town council of every borough having a separate court of quarter sessions, and in Scotland the commissioners of supply at their ordinary meetings for counties, and town councils within their several jurisdictions, may, for their respective city, districts, counties, or boroughs, appoint and remove one or more persons possessing competent medical, chemical, and microscopical knowledge as analysts of all articles of food, drink, and drugs purchased within the said city, metropolitan districts, counties, or boroughs, and shall pay to such analysts such salary or allowances as they may think fit; but such appointments and removals shall at all times be subject in Great Britain to the approval of one of her Majesty's Principal Secretaries of State, and in Ireland to that of the Lord Lieutenant.

5. The inspector of nuisances or the inspector of weights and measures or the inspector of markets, one or all of them, as the local authority appointing them shall think fit to determine, in every district, county, city, or borough, may procure and submit samples of articles of food or drink and drugs suspected to be adulterated to be analysed by the analysts appointed under this Act, and may, upon receiving a certificate stating that the articles of food or drink or drugs are adulterated, cause a complaint of an offence against this Act by the party selling or adulterating such articles of food or drink or drugs to be made before a justice of the peace, and thereupon such justice shall issue a summons requiring the seller or the adulterator to appear before two justices of the peace at petty sessions in England, and in Scotland before two justices of the peace in the justice of the peace court, or before the sheriff substitute of the county, or before justices of petty sessions or divisional justices in Ireland, to answer such complaint, and such summons shall be served by delivering the same, or a true copy thereof, upon the premises where such samples were obtained or sold, and the expense of such prosecutions, if not ordered to be paid by the party complained against, shall be deemed part of the expense of executing this Act.

6. The analysts appointed under this Act shall report quarterly to the local authorities appointing them the number of articles of food, drink, or drugs analysed by them under this Act during the foregoing quarter, and shall specify the nature and kind of adulterations detected in such articles of food, drink, and drugs, and all such reports shall be read at the meetings of the local authorities appointing such analysts.

7. On the hearing by the justices of any complaint under this Act in any district, county, city, or borough wherein analysts shall have been appointed under this Act, the purchaser, or inspector of nuisances, or the inspector of weights and measures, or the inspector of markets, as the case may be, shall prove to the satisfaction of such justices that the article of food or drink or drugs alleged to be adulterated was delivered to the analysts in the same condition as regards its purity or impurity as it was when received from the seller.

8. Any purchaser of any article of food or drink or drugs in any district, county, city, or borough where there is any analyst appointed under this Act shall be entitled, on payment to the inspector or inspectors appointed under this Act of a sum not less than one shilling nor more than five shillings, to have any such article analysed by any analyst who may be appointed for such district, county, city, or borough, and to receive from such analyst a certificate of the result of his analysis, specifying whether, in his opinion, such article is adulterated, and also whether, if it be an article of food or drink, it is so adulterated as to be injurious to the health of persons eating or drinking the same, and such certificate, duly signed by such analyst, shall, in the absence of any evidence before the justices or in any court of justice to the contrary, be sufficient evidence of the matters therein certified, and the sum so directed to be paid for such certificate shall be deemed part of the costs.

9. All articles of food, drink, or drugs to be analysed by the analysts appointed under this Act shall be received by the inspectors appointed by the local authorities, and from all such articles of food, drink, or drugs samples shall be taken and sealed in the presence of the analysts by the inspectors, to be retained by them and produced in case the justices shall order other analyses to be made.

10. The expense of executing this Act shall be borne, in the city of London and the liberties thereof, out of the consolidated rates raised by the commissioners of sewers of the city of London and the liberties thereof, and in the rest of the metropolis out of any rates or funds applicable to the purposes of the Act for the better local management of the metropolis, and in counties out of the county rate, and in boroughs out of the borough fund, or out of the police money in counties in Scotland.

11. Nothing in this Act contained shall be held to affect the power of proceeding by indictment, or to take away any other remedy against any offender under this Act.

Proprietary Rights in "Patent" Medicines.

Sheriff Barclay, of Perth, has issued an interlocutor in the case of *Glass* v. *Dandie, Newby and Dandie*, in which Mr. Alex. Glass, druggist, Methven Street, Perth, sought to have Messrs. Dandie, Newby and Dandie, druggists, High Street, Perth, restrained from selling a medicine called Dr. Henderson's elixir, of which the pursuer alleged he was sole proprietor. The interlocutor (which is appended) fully explains the circumstances of the case:—

Perth, 23rd Feb. 1872.—Having heard parties' procurators, and made avizandum with process and proofs: Finds, as matters of fact—(1.) That the late William Henderson, Doctor of Medicine in Perth, for a period of about forty years previous to his death, which occurred in October, 1870, manufactured and sold a medicine under the name and known as "Dr. Henderson's Concentrated Stomachic Vegetable Elixir," or more briefly and familiarly as "Dr. Henderson's Elixir," and which medicine obtained a great repute and consumpt, at least sale. (2.) That it is not proved that Dr. Henderson ever obtained or held a patent for the exclusive manufacture and sale of said medicine; but the same was sold in bottles bearing his name and signature, and also with a Government stamp, denoting it to be a "patent medicine," which it was not. (3.) That Dr. Henderson some short time before his death gifted a paper containing the recipe for the preparation of said medicine to Archibald Macdonald, who was married to a niece of the said Dr. Henderson, and also provided for a facsimile of his signature being photographed in order to be thereafter attached and to accompany the bottles containing his preparation from said recipe. (4.) That since Dr. Henderson's death the pursuer has purchased the said recipe for a valuable consideration from Mr. Macdonald, and continues to manufacture and sell the medicine, made up in bottles in all respects the same as when sold by Dr. Henderson himself. (5.) That during Dr. Henderson's life the defenders purchased from Dr. Henderson and sold in their shop large quantities of said elixir. (6.) Since Dr. Henderson's death the defenders have prepared, and sold under the name of "Concentrated Stomachic Vegetable Elixir," at a price considerably less, and of a quality, as alleged by them, equal if not superior to the medicine prepared by Dr. Henderson, and now sold by the pursuer. (7.) It is not proved that the defenders have advertised and sold the medicine so prepared by themselves under the name of Dr. Henderson, nor with his name or signature attached to the bottles. (8.) That in the month of November last, on four several occasions, persons sent by the pursuer to the defender's shop generally asked for Dr. Henderson's elixir, and were furnished with bottles containing the defender's own preparation, paying the lesser price therefor, and that such sales were made without any distinct statement by the sellers that it was or was not the preparation of Dr. Henderson, and was received by the said persons without challenge. Applying the law to the facts herein specially found, finds that the pursuer has not established sufficient facts whereon to found an interdict against the defenders of the nature and within the extent craved; therefore assoilzies the defenders from the action: Finds them entitled to expenses, allows account thereof to be lodged, and remits the same to the auditor to tax, and decerns.

In a long note appended to his interlocutor, the learned Sheriff says that the Patent-laws have long been a subject of contest in the field of political economy, and, with all its changes, these laws have not yet been settled upon such a sound basis as to give an inventor a reasonable protection for his invention, and to secure the public from its becoming an evil instead of a benefit. He remarks that he is at a complete loss to discover how, in the case of Dr. Henderson's elixir, and any other medicine generally denoted under the ornithological title of "quack," any quantity of Revenue stamps may be purchased without inquiry or security at a pretty high figure, and attached to any kind or description of drug denoting that it is patented, when, in point of fact, it is not. This looks very like the Government throwing its shield of protection over fraud, and encouraging the not very wise policy of the sale and consumption of medicine of all and every kind which, in the present rage for sanitary and hygienic reform, may be far from sound policy. It is bad enough for the hypochondriacal section of the public to pay for and unnecessarily to swallow drugs, without having in addition to pay to the public exchequer a considerable addition for the privilege. Referring to the law of trade-marks, under which, he says, the case falls to be decided, Sheriff Barclay observes that the marks which indicate particular manufactures consist of all descriptions of geometrical figures and hieroglyphics which would puzzle the most eminent archæologist to decipher. The best of all trade-marks is, of course, the signature of the man whom the public seeks most to honour, and which in return he desires in his own way to patronize. It is, therefore, of everyday occurrence to find in every newspaper a "caution" to the public, not that they should cease to swallow medicine, but only such as bears the charmed name of "Solomon," "Holloway," "Parr," or of some other celebrity in that extensive hemisphere. To imitate the signature would approximate very closely to forgery. After citing several analogous cases, and applying the principles involved in the decisions, Sheriff Barclay says he is of opinion that during Dr. Henderson's lifetime, seeing that his preparation was not patented, the defenders or any person could, on an analysis of the drug or otherwise, have prepared exactly the same medicine, and advertised and sold it under the same medical denomination, but they could not have advertised Dr. Henderson's name, or attached it to their medicine bottles, and much less put thereon his signature. In the absence of any competing title, it may be fairly assumed that the pursuer has now the same rights as Dr. Henderson, and consequently he could prevent the defenders or any one advertising that they had acquired the recipe, were the sole manufacturers of Dr. Henderson's medicine, or affixing his name or signature to the bottle, but he (the Sheriff) cannot find authority for restraining the defenders from selling their own preparation under their own name. Perhaps the most straightforward course would be when a person asked for Dr. Henderson's elixir at once to say they had it not, and that said there was nothing wrong in the freedom of trade to offer their own as cheaper and better. The public in that case must be their own judges. The offence of the defenders was of a negative morality. The parties who came could alone complain of being deceived. They came for the purpose of asking for Dr. Henderson's medicine, the price of which they must have known and been ready to pay, and in return they got what they expected—the defender's own medicine at a shilling less of cost.

Prosecution for the Sale of Rat Poison.

At the Londonderry Petty Sessions, Mr. Prior (of the firm of W. J. Eames and Co., Licentiate Apothecaries) appeared in answer to a complaint for selling poison contrary to Act of Parliament.

Head-Constable O'Connel said that a little girl named Margaret Coyle, on Sunday morning, went into Mr. Prior's shop, and asked for rat poison, and got threepence worth of it. She had been away from home for some days, and being afraid to go back, took the poison on an orange. She was promptly attended by some medical gentlemen, or death would have resulted. The Act of Parliament, passed on 14th July, 1870, the 33rd and 34th Vict. c. 26, provides that poison must be labelled as poison and not sold to strangers, unless introduced by parties known to the vendor, and even then the names of those to whom it is sold must be entered in a book to be kept by the vendor.

Mr. Prior produced the labels on the vermin poisons, showing that they were properly labelled, and said that, as licentiate apothecaries, the firm which he represented was exempted from that Act. He thought it applied only to vendors of poison who were not licentiate apothecaries. The vermin poison was sold in grocers' shops in Buncrana and elsewhere.

Captain Keogh (a magistrate) having read the section, said: If you say that you did it in ignorance of the Act of Parliament in question, we will inflict a very small penalty; but if you attempt to justify it we will prove the case, and inflict a very heavy penalty.

Mr. Prior: I was certainly not aware that we were required to enter in a book the names of those who bought poison. There is a list given of medicines which cannot be sold but by licensed apothecaries; and if that contains strychnine I am authorized to sell it; but, suppose a person comes in for a small portion of chloroform or laudanum for toothache, if we are compelled to enter them in a book we might as well shut up shop.

Captain Keogh (after looking at the Act): Then shut up shop at once, for chloroform and laudanum are two of the things enumerated. This Act was found necessary from the number of deaths by poisoning taking place, happily not in this country; but, in consequence of the wholesale system of poisoning carried on in England, it was found necessary to pass this Act, and I see that it applies to Ireland.

Mr. Prior: It forms such a minute portion of my business that I will discontinue the practice of selling it at all. I was told no later than Saturday, by a licensed apothecary, that it did not apply to us at all.

Sir Edward Reid (chairman) said that the case was brought into court to make the law known, and the magistrates would inflict only the small penalty of 2*s.* 6*d.*—*Sentinel.*

Suicide by a Vermin Killer.

An inquest was held on Wednesday, February 28th, on the body of Elizabeth Barrow, aged eighteen, who died on the previous Sunday from the effects of poison administered by herself. It appeared from the evidence that on Tuesday, the 20th February, deceased had purchased a packet of Steiner's Vermin Paste at a drysalter's, and had taken it mixed with tea and sugar. At first she denied having taken any poison, and showed no signs of poisoning until the next evening, when she was taken ill and a medical man was called in. She did not die until the following Sunday.

Samuel Harrison said he was assistant to his father, a drysalter, carrying on business at 72, Huddersfield Road. He remembered selling the deceased a bottle of Steiner's Vermin Paste on Tuesday the 20th instant. The paste contained phosphorus. In consequence of something said to him he saw her on the evening of the same day. Asked her if she had taken poison, when she said, "No." He asked her for the bottle, but that, she said, had been thrown away. He then told her he would fetch the police, but she replied that she did not care for that, and he then left her, believing that she had not taken the paste. Witness read a communication from Steiner and Co., containing a statement made by Arthur Hill Hassall, M.D., that he had tested the paste and testified "that it does not contain any of the poisons mentioned in the recent Pharmacy Act, and the sale of which is restricted thereby."

Witness produced a list of the poisons prohibited to be sold except under certain regulations, and the Coroner, after reading it, said there was one sentence as follows: "Every compound containing poison and sold for the destruction of vermin." So that the paragraph witness had read was a most misleading one, representing that the sale of this poison was not prohibited, simply because phosphorus, of which it was principally composed, was not mentioned in the Pharmacy Act.

Witness: I can't see that.

The Coroner: But I can, and if you like I will direct a prosecution which will test the matter. That will, perhaps, be the better plan.

Witness observed that there were no less than 700 drysalters in London who sold the paste.

The Coroner: Then they should not. The paste is a poison, and a most deadly poison, and this cannot be too well known.

The coroner in summing up the evidence said he thought the vermin destroyer ought not to be sold by drysalters and others without the precautions required by the Act. It was a very wrong thing to sell such compounds to young people. He would be very sorry to do so, but the only way would be to institute proceedings against the man Harrison for selling the poison without carrying out the requirements of the Pharmacy Act. It was decided to adjourn the inquest to next Thursday, and in the meantime a *post-mortem* examination will be made for the purpose of discovering whether any other poison had been taken except the paste.

Review.

Diseases of the Hair: a Popular Treatise upon the Affections of the Hair System, with Advice upon the Preservation and Management of Hair. By Benjamin Godfrey, M.D., F.R.A.S., etc. London: J. and A. Churchill. 1872.

Those persons who like to take their science wrapped up in a quantity of light gossip like a child's powder in a spoonful of jam, may find in this "popular" treatise upon the affections of the hair an opportunity of pursuing their "studies," and at the same time of relieving their minds from more severe work by a little pleasant reading. In dealing with the subject in hand the author has not confined himself to one branch of it, nor to one country or age. He says, "I have culled flowers and fruit from the Bible, the Zend Avesta, and the Talmud. I have gathered sheaves from the Greeks, the Romans and the Egyptians, and have gleaned stray ears of corn from every harvest-field where my feet have trod." With this wide range, and moved to pity by the wants of the present day,—especially as pointed out in a letter to the *Lancet*, wherein it was estimated that one person in ten of any large assembly in this country was bald to a greater or less degree,—the author has written the little volume before us, which he has somewhat characteristically dedicated to the "heads of Great Britain."

We must confess that making all due allowance for the fact that the beauties of the hair have often been sung by poets, and that in what are now-a-days called popular scientific works, the "science" is frequently diluted or "popularized" by a large proportion of rhapsodical writing, we were hardly prepared for the opening sentences. After an appropriate poetical quotation, the author breaks out into a gush of eloquence, or poetry, or—something, sufficient to take one's breath away! But let him speak for himself.

"If Nature be left alone, how exquisitely does she do her work! Whether we gaze upon the pensile twigs of the weeping willow, or the long, flowing, curled and wavy hair of one of her children, how perfect and how free! Beautiful in her simplicity, and magnificent in her plenitude. The soft down of the peach, reflected upon the head of the infant, the ripple of the stream mirrored upon the wavy lock of childhood, or the autumnal hue of the dying leaf, living upon the grey hair of the aged man, all speak in accents powerful to the reflective mind. How soon was the puerile innocence of Eden spoilt, when the tree of knowledge was tasted! The glow of health vanished like a sunbeam, the primeval joy passed away like a shadow, and weeds and sorrow were left behind," "etc. etc."

Indeed, it is quite amusing to notice the ingenuity with which he frequently avoids calling a spade a spade. 'Nature's hirsute beauty,' 'streaming tresses,' 'lovely' or 'glossy locks,' 'crinal glory,' 'curly pate,' 'threads of gold,' are all synonyms of hair, backed up by frequent 'comate' coverings, materials, structures, wonders, and filaments. A bald head is a 'sterile cranium;' a hair in a wrong place is a 'hirsute intruder,' Mr. Erasmus Wilson is spoken of in connection with 'philocomate writers;' while such words as 'epilation' and 'depilation,' 'aberuncate,' 'avulsion,' and 'chromatogenous,' however familiar to scientific men, will send a fair proportion of "popular" readers to the dictionaries.

But it would be unfair to dwell only on these peculiarities. After the first novelty has worn off, they may not appear so striking. At any rate, as the author evidently seeks to secure variety by making the reader sometimes laugh with him, he will, perhaps, not mind if once now and then the laugh is at him. In twenty chapters the author discusses the anatomy and physiology of the hair, its superabundance or deficiency, the different diseases which affect it and their remedies, its colours, natural and artificial, and winds up with a rather speculative chapter on the beard. Each subject is introduced by pleasantly-told illustrations from ancient and modern sources. Some of these stories—and we are sorry to say, particularly those whose age might demand our veneration—require to be taken *cum grano salis*, in fact, some people may think a pailful would not be too much; but, as a rule, they will not be without interest to the pharmacist, who is often expected to know a little about everybody and everything. A great deal of practical information is, however, to be found in the book, the nature of which only can be indicated in this notice.

In the chapter on the anatomy and physiology of the hair, an interesting account is given of its growth and structure. The chemistry of hair is described as follows:—

"The chemical composition of hair is allied to other horny tissues, such as the nails of the fingers and toes, the horns and the hoofs of mammals, and the whalebone of commerce. All contain a large amount of animal matter and sulphur. Hair consists of—

Carbon	49·9
Hydrogen	6·4
Nitrogen	17·1
Oxygen	21·6
Sulphur	5·

"The chief constituent is a nitrogenous substance containing sulphur, which is the cause of the unpleasant odour given out when hair is burnt. This material is soluble in alkalies, with the development of ammonia. It is insoluble in boiling acetic acid, which thus distinguishes it from horn and epidermis, from albumen and fibrine. It is quite soluble in strong sulphuric acid and in liquor potassæ.

"There are various coloured oily matters in different kinds of hair. *Red hair* contains a reddish oil, a large proportion of sulphur, and a small quantity of iron. *Black* possesses a large proportion of oxygen and sulphur, but less hydrogen and carbon. *White* has a white oil with phosphate of magnesia, and in the aged, phosphate of lime exists in abundance. *Fair* has the most oxygen and sulphur, but less carbon and hydrogen than hair of any other colour. *Brown* yields the largest proportion of carbon, with smaller of hydrogen, oxygen, and sulphur.

"When hair is burnt, the ash yields oxide of iron, oxide of manganese and silica. White hair yields sulphate of alumina. The action of hair dyes depends upon the chemical changes between the sulphur in the cranial covering and the metallic material used.

"Thus the salts of silver and manganese blacken the hair by forming sulphurets of the metals, and chlorine and its salts decolorize it. Alkalies, such as potash and soda, partially bleach it. Peroxide of hydrogen lightens dark hair imperfectly, and therefore fails as a dye. Bichloride of mercury with a mordant of sulphide of ammonium produces a red tint."

Here is a pleasant method by which an economic student having lady friends may obtain a cheap charge of electricity.

"If a lady stand upon an insulated stool and have her hair combed quickly, enough electricity will be generated to send forth sparks from her body."

The following are the results of some experiments made by the author to test the elasticity and strength of various coloured hairs:—

		Age.	Measured. in.	Stretched to in.	Contracted to in.	Suspended. oz.
1	Dark Brown .	24	31	36	34	4
2	" .	25	36	46	40	3
3	Red	24	12	16	—	3
4	Light Brown.	6	13	17	—	3½
5	Dark . . .	38	11¾	14½	—	3
6	" . . .	17	27½	34	—	2½
7	Light Brown.	80	7	9	7½	1¼
8	Blonde . . .	25	16	—	—	2½
9	" . . .	10	11¼	—	—	2¼

"Case 7 was that of an elderly gentleman who had never used any oil or pomatum to his hair. Case 4 was that of a child whose hair had never been cut."

While speaking of colour it is curious to notice that the present preference for what Dr. Godfrey would call 'golden tresses,' or 'auricomous locks,' is one of very old date. Indeed, we are inclined to think their possessors get more than a fair share of favour. Compared with others, they are blessed with a larger number of hairs, the pigment granules of which form a beautiful object under the microscope; according to published statistics they are less liable to disease, whilst even the lightning has been known to spare the red hairs in the coat of a pied bullock!

Considering the prevalence of baldness, it is rather suggestive of the depravity of the human race to be told that "vice of all kinds, from anger to syphilis, has something to do in producing this morbid phenomenon." It is quite a relief to learn that a little "vice" may go a long way, as "bald people are usually very prolific," and transmit their peculiarity to their male descendants, each generation developing the baldness at an earlier age than the preceding one. Whilst, however, it is thus the lot of many to be deficient in their 'comate covering,' there are some persons who have more than they well know what to do with. Several instances of this curious affection are given, including a description of the celebrated Burmese family. But is it not rather unfair to the head of this household, considering the origin of the word, to say that he did not arrive at puberty until he was twenty, although he was covered with hair from head to foot before he had reached his teens?

The affections of the hair system are discussed separately, and treatment is laid down in each case. In justice to the author, however, and with a proper horror of "counter prescribing," we abstain from quoting these remedies, save in one or two instances, where rather docile patients would be a *sine quâ non*. For the treatment of dandriff we are told—

"The Arabians, especially Serapion, ordered the patient to be bled, blistered, and purged; and if these remedies did not kill the disease or the patient, Galen directed arsenic to be well applied to the eruption."

For the treatment of eyelashes that grow inwards, Celsus "coolly" recommends—

"An iron needle, thin and broad, like a spatha,* must be put into the fire, and when it is red-hot the eyelid being lifted up in such a manner that the offending lashes are in view of the operator, it must be passed from the angle close to the roots of the hair, till it move over the third part of the eyelid; then it must be applied a second and third time as far as the other angle. The consequence of which is, that all the roots of the hairs being burnt, die away."

We can but hint at a non-officinal remedy in the shape of an animal that once furnished Burns with a subject for some verses, which the author knows to have been taken in jam for a diseased liver by an elderly gentleman, at the recommendation of a nautical friend.

The formulæ of hair dyes, hair restorers, washes and pomades, are next treated of. A rough analysis of the most noted 'restorers' is given, and the result of an examination of some pomades, from which we learn that as a rule they contain nothing "harmful." Indeed, the author's admiration of pomades and similar preparations is rather a negative one, for he says that oleaginous substances are "not detrimental to the growth of the hair, and are only injurious when they cover in dirt." He has evidently more faith in the effect of frequent cleaning.

We can but just allude to the last chapter, in which the author propounds one or two theories as to the origin, presence or absence, and use of the beard. Its presence upon the chin and not upon the toes he believes is

* Spatha was a knife ending in an acute point and double-edged.

due to the fact that upon the chin the male has cultivated it by a sort of Darwinian development. Certainly it might be called a 'struggle for existence' in some cases. He says, "Hereditary tendency has handed down to us the beard, as it has done our physiognomies and our diseases. The young man arrives at puberty, and he expects his hairy ornament. How patiently he strokes his chin day by day! how constantly does he watch the embryo hair! No sooner does it appear through the skin than razor and unguent, spirit and attention are poured upon it, and as thought draws an increased flow of blood to any part, so the beard gets more than its share." He is also of opinion that our mightiest thinkers,—instancing Byron, Milton, Thiers, Dante, Johnson, Burke, Sheridan and Goldsmith,—have been smooth-faced. According to the above theory, we suppose this has arisen from their having something better to think about. But the development idea clashes sadly with those acknowledged authorities, the picture books of our childhood, where Adam is always represented with whiskers at least.

We conclude by expressing an opinion that this book will be honoured by a larger proportion of second readings than many a more pretentious one.

MEETINGS FOR THE ENSUING WEEK.

MONDAY.........*London Institution*, at 4 P.M.—"Elementary Chemistry." By Professor Odling.
March 4. *Medical Society*, at 8 P.M.

TUESDAY ......*Royal Institution*, at 3 P.M.—"On the Nervous and Circulating Systems." By Dr. Rutherford.
March 5.

WEDNESDAY...*Pharmaceutical Society of Great Britain*, at 8.30 P.M. "The Pharmaceutical Preparations of Ipecacuanha." By Dr. Dyce Duckworth. "Note on *Cinchona calopter*a, Miq." By Dr. J. E. De Vry.
March 6. *Society of Arts*, at 8 P.M.—"The Goliath Training Ship." By Capt. Bourchier, R.N.
Royal Microscopical Society, at 8 P.M.

THURSDAY......*Royal Society*, at 8.30 P.M.
March 7. *Chemical Society*, at 8 P.M.—"The Reduction of Ethylic Oxalate by Sodium Amalgam." By Dr. Debus. "On Metastannic Acid and the Detection and Estimation of Tin." By Mr. A. H. Allen.
Linnean Society, at 8 P.M.
Royal Institution, at 3 P.M.—"The Chemistry of Alkalies and Alkali Manufacture." By Professor Odling.

FRIDAY ....*Royal Institution*, at 9 P.M.—"Faults of Vision in Painting." By Mr. Liebreich.
March 8. *Quekett Club*, at 8 P.M.

SATURDAY......*Royal Botanic Society*, at 3.45 P.M.

Notes and Queries.

*** *In order to facilitate reference, correspondents are requested to mark their answers in each case with the title and number of the query referred to.*

No notice can be taken of anonymous communications. All queries or answers should be accompanied by the name and address of the writer.

[308.]—COLOURING FOR VARNISH.—"*Ignoramus*" wishes to be informed of an economical process for colouring shellac-varnish without sediment, to produce a light yellow colour upon wood.

[309.]—FLUID EXTRACT OF SARSAPARILLA AND QUININE.—"*Spero*" asks for a formula for preparing a clear mixture of fluid extract of sarsaparilla and quinine.

[310.]—GOLD PAINT.—*W. T.* will feel obliged by a recipe for making gold paint that will keep its colour, to use instead of gold leaf.

[311.]—THE COATING OF IRON WITH ANTIMONY.—*G. E.* wishes to be informed of a cheap, simple and expeditious process for coating iron with antimony.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

HYDROCYANIC ACID.

Sir,—In Mr. Gilmour's paper on "Volumetric Analysis" (a subject to which I hope he may again refer), he pointed out the extreme variability in the strength of acid. hydrocyanic.

Some short time back I tested a sample of Scheele's acid kept in an ounce stoppered bottle in a cool place. There was about two drachms left in, and this gave, with the nitrate of silver test, only 0·5 per cent. The stock from which it was taken, a Winchester quart nearly full, gave 4·5 per cent.

G. C. DRUCE.

X. Y.—Any arsenic that is sold without complying with the provisions of section 3 of the Arsenic Act must be sold under the regulations laid down in section 17 of the Pharmacy Act.

"*Inquirer.*"—For additional information on the subject referred to, you are recommended to apply at the Admiralty.

W. A. G.—Clause 15 of the Pharmacy Act, 1868, provides that it shall be unlawful for any person to "take, use or exhibit the name or title pharmaceutical chemist, pharmaceutist *or pharmacist*, not being a pharmaceutical chemist."

"*A Minor Associate.*"—A "general knowledge of the elementary structure of plants" is required in the Minor examination; but an "intimate acquaintance with the parts of the flower, fruit and seed," and "the functions of the different organs of plants," is required in the Major. Apply to the Secretary for "the Regulations of the Board of Examiners."

W. J.—The Modified examination was instituted to meet the case of those who were connected with the business at the time of the passing of the Pharmacy Act, but not then entitled to be placed on the Register. The fact of having passed it, however, does not obviate the passing of the Preliminary before seeking to pass the Minor examination, nor does it make any difference in the fees.

"*Frankincense.*"—See some recipes in Vol. I. of the present series, p. 1043.

W. Wyles.—No. The word *tertiam* is doubtless intended for *tantum* ("only") in the original prescription. "A draught containing eight minims of tincture of opium to be taken immediately, and repeated every five hours with three minims *only* of tincture of opium."

"*Veritas.*"—Dissolve the iodide in the water, add the syrup, and lastly the fluid extract gradually. Appearance, a slightly opaque dark brown.

S. N.—(1.) One is as good as the other; the names are practically synonymous. (2.) Page's 'Introductory Text-Book of Geology,' published by Blackwood and Sons, price 2*s*.

T. H. writing in reference to the case of accidental poisoning at Caldbeck, remarks that it does not appear why the powder should have been an "unusually large one," since calomel is not a drug likely to make a large powder if a proper dose be given; and again, supposing it had been for the father, two and a half grains of opium would have been a slightly dangerous dose, even for him.

The following journals have been received:—The 'British Medical Journal,' Feb. 24; the 'Medical Times and Gazette,' Feb. 24; the 'Lancet,' Feb. 24; the 'Medical Press and Circular,' Feb. 28; 'Nature,' Feb. 24: the 'Chemical News,' Feb. 24; 'English Mechanic,' Feb. 23; 'Gardeners' Chronicle,' Feb. 24; the 'Grocer,' Feb. 24; the 'Journal of the Society of Arts,' Feb. 24; the 'Chemists and Druggist's Advocate,' Feb. 20; the 'Oldham Evening Express,' Feb. 26 and Feb. 28; the 'Edinburgh Courant,' Feb. 24.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. O. Reade, Mr. J. Hallawell, Mr. J. E. Howard, Mr. J. Goodrick, Mr. Neil Reid, Mr. Symes, J. K., M. P. S., "Inquirer."

NOTES ON THE PHARMACY OF IPECACUANHA.*

BY DYCE DUCKWORTH, M.D., F.R.C.P.,

Assistant-Physician to St. Bartholomew's Hospital.

I have been engaged at intervals for the last three years in studying the physiological and therapeutical actions of ipecacuanha, and consequently have had occasion to employ both the officinal and other preparations of this drug.† I have likewise made use of its true alkaloid, emetia, as prepared by Messrs. Hopkin and Williams.

The object of my communication to this Society to-night is to call attention generally to the pharmaceutical preparations of ipecacuanha in the British Pharmacopœia, but most especially to the importance of securing better fluid preparations of the drug than we at present possess.

As to the ordinary powder of the rhizome, I think no remark is called for. I am informed that this is generally to be obtained in the shops void of adulteration, and, provided that the rhizome is of good quality, and is a genuine specimen of ipecacuanha, there is hardly an objection to be made to it. The most probable adulteration is with the rhizomes of *Psychotria emetica*, a striated variety, called Peruvian ipecacuanha. This plant is less rich in emetia, and contains rarely more than 6 per cent., while the best rhizomes of true ipecacuanha yield $10\frac{1}{2}$ per cent. of the pure alkaloid.‡ Dr. Attfield has recently§ made some assays of different specimens, and in particular of a variety of *Psychotria* which was sent from Bogotá, and which he found to contain only $2\frac{1}{2}$ per cent. of emetia, with great excess of grape sugar. He rightly urges that no more of this latter quality should be imported into Europe.

It is important to select such rhizomes as are not too broad, for it is found that the bulk of such specimens is mainly due to the central woody matter which is devoid of emetia, and therefore worthless.

Ipecacuanha enters, as you well know, into the following officinal preparations:—Pulv. ipec. co., or Dover's powder; pil. conii co.; pil. ipec. c. scillâ; trochisci ipecac.; trochisci morphiæ et ipecac.; and the vinum ipecacuanhæ.

I believe that all these preparations are excellent, both as pharmaceutic compounds and for practical purposes. I would especially instance the great value of the Dover's powder and the pil. ipecac. c. scillâ. It is when we consider the only fluid preparation in the list that we have reason to be dissatisfied with it. It is somewhat remarkable that no other solutions of ipecacuanha have been enjoined in the British Pharmacopœia; in most of the foreign dispensatories there are several formulæ for syrups, liquid extracts, or tinctures.

It is not, however, important to enumerate either the names or the peculiarities of these several preparations, because, with one exception, they cannot be considered satisfactory.

The exception is in favour of the syrup of the United States Pharmacopœia, which is made from an aceto-alcoholic extract of the drug, and this leads me to speak next of the best solvents for ipecacuanha.

These are three in number, viz. acetic and tartaric acids and rectified spirit of wine; they dissolve the emetia out of the rhizome, and there are the best reasons for believing that the alkaloid represents the active principle of the remedy.

In the vin. ipecac. the emetia is dissolved in part by the 17 per cent. of alcohol contained in the sherry, and partly also by the acid tartrate of potassium. Ipecacuanha wine, when freshly made, looks eminently satisfactory as a preparation, but it is found to become turbid after a time, and to deposit a brownish, muddy sediment. The same phenomena ensue when a proof-spirit tincture of the drug is made. (A rectified-spirit tincture, such as is used in homœopathic pharmacy, or rather was formerly enjoined in their codex—for they now employ proof-spirit for many of their tinctures—retains its brightness, and throws down no sediment.) This ugly sediment engaged my attention a good deal at one time, and I examined it with some care. I should add that emetia itself dissolves perfectly in sherry, but with some difficulty, and after a time the solution throws down a similar sediment, though in smaller quantity, to that found in the wine and proof-spirit tincture. Filtration removes the turbidity, but only for a time. I have learnt from many inquiries amongst pharmacists that some frequently filter the wine, and others dispense the preparation only after shaking up the bottle, and therefore in the turbid state. They have generally seemed ignorant as to the nature of the deposit, though they have believed it to contain some of the active part of the drug.

If some of this matter be examined under the microscope, it will be found to consist of a yellowish, granular, amorphous material. It has been supposed to be glucose or starch, but it is neither the one nor the other. Neither tartaric nor acetic acids have any effect upon it, nor is it dissolved by ether, chloroform, alcohol or ammonia. The only solvent I have found for it is the liquor potassæ. Hence, I satisfied myself that it was not emetia, for this alkaloid is soluble in acids and alcohol, and only slightly so in ether, while it is insoluble in alkalies. The reaction of the precipitate is acid, and it has a bitter and somewhat aromatic taste. I was indeed at a loss to know what its exact nature was till Dr. Attfield informed me that it is a mixture of the acid tartrate of potassium and cephaelate of emetia. To quote his own words, "The cause of its appearance is, I presume, the slow formation of alcohol from the residual sugar in the sherry, a menstruum being produced in which the tartar is decreasingly soluble. With the tartar is deposited the natural salt of the alkaloid, because the former is the solvent of the latter. A proof-spirit tincture is not more stable than ipecacuanha wine; what is wanted to retain the alkaloidal salt in solution being not alcohol but acids, or such an acid salt as cream of tartar." Dr. Attfield stated to me also that the wine deteriorated gradually in strength according to the amount of deposition, which is exactly what might be expected. I find that the addition of 3 or 4 minims of liquor potassæ to a drachm of the muddiest wine or tincture of ipecacuanha renders it quite bright and clear, and of the colour of old port-wine. Liq. ammoniæ darkens but does not clarify it. The bitterness and aroma of

* Read at the Evening Meeting of the Pharmaceutical Society of Great Britain, March 6, 1872.

† St. Barth. Hosp. Reports, vol. v. 1869, and vol. vii. 1871.

‡ Although Dr. Attfield claims 10 per cent. as the amount of emetia yielded by the best specimens of ipecacuanha, it seems doubtful whether so large a quantity is really obtained. There is reason, indeed, to believe that 2 per cent. is about the amount that can be procured from the rhizomes of true ipecacuanha.

§ Sept. 1869, *vide* PHARM. JOURN. 2nd Ser. Vol. XI. p. 140.

the sediment are due to the ipecacuanhic or cephaelic acid, which is described by Pelletier* as bitter.

There can, therefore, be no doubt that ipecacuanha wine is an unsatisfactory pharmaceutical preparation; and I hold it to be no rejoinder to this statement if either the physician or the pharmacist aver that they are perfectly satisfied with it as it is. For all practical purposes I believe the vin. ipecac. of the shops is quite efficient, but I maintain that there is a better preparation, and that on all accounts it will be proper to employ it. I pass on next to describe what this is. We have already seen that sherry wine is not the best solvent of this drug, and that other menstrua succeed perfectly in taking up the emetia. In November, 1860, a paper was read before this Society by Mr. George Johnson,† a pharmacist of Birmingham, in which he stated that, while seeking some cheap menstruum for the drug, he found from Pereira's work that acetic acid was the best solvent for emetia, and he proceeded to make an acetic solution according to the formula of the London Pharmacopœia of 1851, then in use. Two and a half ounces of the bruised rhizome were macerated in five fluid ounces of acetic acid. Thirty-five ounces of water were then added, and the maceration was continued for twenty-four hours longer, with frequent shaking. The solution was then filtered and strongly pressed. A rich brown solution was the result; and Mr. Johnson believed this to be nearly twice as strong as the vinum ipecacuanhæ, because, on testing with tincture of galls, after careful neutralization with ammonia, a precipitate of tannate of emetia was thrown down in much larger quantity than fell from an equal amount of the wine after similar treatment. Moreover, fifteen drops of the preparation sufficed to induce vomiting in young children.

Mr. Johnson very properly claimed for this acetum ipecacuanhæ the merits of pharmaceutic exactness and of cheapness, and he urged that this preparation should be introduced into the British Pharmacopœia. His plea for its importance was, however, unheeded by the Committee who superintended that work. Mr. Johnson has also recommended that a weak alcoholic tincture might be employed, which should contain four grains of tartaric acid in the ounce. He proposes that four parts of distilled water should be added to one part of rectified spirit, and this menstruum, with the tartaric acid, he believes, would secure the most stable preparation of ipecacuanha.

I pass on now to describe the process recommended in the United States Pharmacopœia for making the syrup of ipecacuanha. A fluid extract is first prepared by means of acetic acid and alcohol, as follows:—

Take of Ipecacuanha in fine powder .	16 troy oz.
Acetic Acid	a fluid oz.
Alcohol.	
Water, each a sufficient quantity.	

Moisten the ipecacuanha with six fluid ounces of alcohol, introduce it into a conical percolator, press it firmly, and pour alcohol upon it until three pints of tincture have slowly passed, or until the ipecacuanha is exhausted. Distil off the alcohol from the tincture by means of a water-bath until a syrupy liquid is left. Mix this with the acetic acid and ten fluid ounces of water, boil the mixture gently until it is reduced to half a pint and the resinous matter has separated. Filter the liquid when cold, and add sufficient water through the filter to make the filtered liquid measure half a pint. Lastly, mix this with half a pint of alcohol.

This process is manifestly a very troublesome and expensive one. The result is a beautiful rich brown-red preparation and very powerful. Messrs. Dinneford and Company have supplied me with some which they made a year ago, and which appears to retain its full activity unimpaired. The syrup is ordered to be made as follows:—Two fluid ounces of the aceto-alcoholic extract are to be mixed with thirty fluid ounces of simple syrup. This preparation, as made by Messrs. Dinneford, I have also examined; and it appears to be a very efficient one. There can be no doubt that, excellent as is the American fluid extract, it is too powerful for ordinary employment, and such a preparation could never take the place of the vinum ipecacuanhæ, since it would cease to be a household or domestic remedy.

Not long ago it came to my knowledge that Messrs. Ferris and Company, of Bristol, had for some time been accustomed to prepare and sell largely an acetum ipecacuanhæ and an oxymel ipecacuanhæ. I communicated with Messrs. Ferris, and they were so kind as to send me specimens of their preparations and their formulæ for the manufacture of them. They state that they consider the acetum a far more stable and reliable preparation than the vinum, and they supply many medical practitioners with it instead of the latter. It is made by macerating half a pound of the bruised rhizome in a gallon of dilute acetic acid for fourteen days. After expression and straining, the preparation is ready for use. It is a bright yellow solution, and throws down no sediment of any kind.

Messrs. Ferris's oxymel is made by mixing one pint of the acetum with two pounds of clarified honey. This must be subsequently evaporated to a proper consistence. The acetum is one-third stronger than the wine; thus twenty minims are equal to half a drachm of the latter. I have employed both of these preparations, and I find that they are excellent and very serviceable.

I am much indebted to my friend Mr. Carteighe, of Messrs. Dinneford and Company, for the trouble he has taken in making several preparations both of the acetum and oxymel. He has recommended the following methods for making these; and it will be seen that they differ somewhat from those employed by Messrs. Ferris. The Pharmacopœial strength of the wine has been maintained both by Messrs. Ferris and Mr. Carteighe, viz. one ounce of the rhizome to a pint of the menstruum.

Take of Ipecacuanha Root (bruised) .	1 oz.
Acetic Acid	1 oz.
Distilled Water, a sufficiency.	

Macerate the ipecacuanha and acid for twenty-four hours; pack in a percolator, and pour distilled water gradually over it until one pint of percolate has been obtained.

A clear bright brown solution is obtained, which throws down no sediment. It is darker and stronger than Messrs. Ferris's preparation; and the value of the method consists in the primary action of the stronger acetic acid, which more completely exhausts the rhizome.

* Pereira, Mat. Med. vol. ii. part ii. p. 1595.

† Pharmaceutical Journal, 2nd Ser., Vol. II. p. 303.

Mr. Carteighe's method for making the oxymel is as follows:—

Take of Ipecacuanha (bruised) . . . 1 oz.
Acetic Acid . . . . 1 oz.
Distilled Water, a sufficiency.
Clarified Honey . . . . . 2 pounds.

Macerate the ipecacuanha in the acid for twenty-four hours, pack in a percolator, and pour distilled water gradually over it until ten fluid ounces of percolate have been obtained. Add the product to the honey and mix.

These, then, are the fluid preparations of ipecacuanha which I desire to recommend to the notice of the Pharmaceutical Society.

I believe that they are decided improvements upon any that have hitherto been devised, and meet a want that has been long felt by both medical men and pharmacists. The processes recommend themselves by their simplicity, the preparations are stable and in all respects satisfactory, while the expense is only about half that entailed by employing sherry wine or spirit as ordered in most Continental pharmacopœias.

As to the doses of the acetum and oxymel, I have prescribed the former in doses varying from five to fifteen minims, and am quite satisfied with the effects. I secured an emetic action with half an ounce in the case of an adult. The oxymel may be employed in doses of from five minims to half a drachm, and continued or not according to the effect produced. I have elsewhere advised that small doses of ipecacuanha are best given frequently for the so-called expectorant or relaxant effect.

Many medical men prescribe the wine with alkaline remedies, and might hesitate to order an acetum ipecac. in such combination. In either case there is chemical incompatibility, though, as in the case of hyoscyamus and alkalies, practitioners will doubtless express themselves as satisfied clinically with the result. Again, the wine does not mix well with emulsion of almonds, although this is often ordered for children. The oxymel, however, will make a very pleasant and palatable mixture in combination with mistura amygdalæ.

It may be, and probably will be, a difficult matter to displace the well-known and reputed ipecacuanha wine from the Pharmacopœia; and, for my part, I am not disposed to urge such a course at the present time. Were the medical profession to cease to employ it, the public would continue to demand it as a common and domestic remedy. If, however, the two preparations I have described, the acetum and the oxymel, be added to the Pharmacopœia, and the vinum be retained for the present, the requirements of chemistry and modern pharmacy will be satisfied, and the physician will be furnished with the best-known fluid forms of the drug; while the public will find in the shops, as heretofore, their old-fashioned remedy unchanged.

[*The discussion upon this paper is printed at p.* 733.]

CINCHONA CALOPTERA, Miq.*

BY DR. J. E. DE VRY.

I am happy to be able to give some information in reference to the subject of the editor's note, on p. 684 of the PHARMACEUTICAL JOURNAL. When I was in Java, there were a few plants amongst the then existing cinchonas which Dr. Junghuhn supposed to be *C. succirubra;* I forwarded a few leaves of this species to my friend Mr. John Eliot Howard and asked his opinion on this point. In his reply of November 9th, 1860, he said, "I doubt whether the leaves you sent as *C. succirubra* are from that plant. Will you tell me, when you write, whether the appearance of the bark is that of red bark?"

Notwithstanding this doubt, this species was still cultivated in Java and reported in the official statements as *C. succirubra*, till at length the late Dr. Miquel described it as a new species to which he gave the name of *C. caloptera.** It was not until 1868 that I had the opportunity of investigating a very small sample of young bark of this species. This bark was very thin, and had not the least analogy with real red bark. I found only 0·55 per cent. of alkaloids in it, consisting chiefly of cinchonine. Mr. Moens, who subsequently analysed the bark in Java taken from older plants, found a larger amount of alkaloids, viz. 3·43 per cent., consisting of 0·63 of quinine and 2·8 of cinchonine.

Since Dr. Junghuhn's death, the real *C. succirubra* has been introduced into Java from British India, and is now succeeding there very well. It will now be clear why the mentioned number of 167,964 plants are quoted under the head of "*Cinchona succirubra* and *C. caloptera.*"

The Hague, February 26th, 1872.

THE COMPLEX NATURE OF CATHARTINE.

BY E. BOURGOIN.†

In a paper on the purgative principles contained in Alexandrian senna, by MM. Bourgoin and Bouchat, a translation of which appeared in this Journal a short time since,‡ the authors asserted that the cathartine of Lassaigne and Feneulle was not a definite principle, but a mixture of several substances; and an intention was expressed to attempt to define exactly the nature of this mixture. In a note recently communicated to the French Academy, M. Bourgoin states that he has found cathartine to contain at least three distinct substances,—chrysophanic acid, a dextrogyrous glucose, and a substance which he proposes to call chrysophanine.

1. *Chrysophanic Acid* is obtained by agitating the cathartine of Lassaigne and Feneulle§ with washed ether as long as coloration is produced. The united liquors, filtered and evaporated, leave an acid residue, very slightly soluble in water, soluble in alcohol and ether, and giving a magnificent red colour with alkalies, which is pure chrysophanic acid. It exists in so small quantity in the plant that M. Bourgoin failed to isolate it; but its presence may easily be demonstrated by infusing a few leaves in water, and adding a few drops of ammonia, which will develope the characteristic red tint.

2. *The Dextrogyrous Glucose.*—Cathartine, freed by ether from chrysophanic acid, gives, with water, a limpid but strongly coloured solution, which ferments under the influence of beer yeast, giving rise to carbonic acid and alcohol; reduces freely the cupro-potassic solution; and, when deprived of the

* Read at the Evening Meeting of the Pharmaceutical Society of Great Britain, March 6, 1872.

* 'Annales Musei Botanici Lugduno-Batavi.'
† Comptes Rendus de l'Academie des Sciences, lxxiii. 1449.
‡ See *ante*, p. 221. § See *ante*, p. 222.

chrysophanine that it contains, turns the plane of polarized light to the right. It may be so isolated by adding subacetate of lead, separating the precipitate, removing excess of the reagent by sulphuretted hydrogen, and evaporating to dryness. The residue will consist of glucose with a small quantity of a bitter principle, which is, without doubt, one of the original glucosides.

3. *Chrysophanine* may be obtained from cathartine by removing the chrysophanic acid with ether, and destroying the sugar by fermentation. It is preferable, however, after the removal of the acid, to precipitate the chrysophanine by subacetate of lead, and afterwards recover it by decomposing the compound with sulphuretted hydrogen. The chrysophanine so obtained is, however, but a small proportion of what is contained in the senna. To obtain it in any quantity, a concentrated infusion should be prepared from at least a kilogram of senna leaves, the mucilaginous matter carefully separated by alcohol, and the limpid solution precipitated by neutral acetate of lead, the excess of lead carried off by sulphuretted hydrogen, and the solution evaporated to a syrupy consistence. The product must then be treated with 90° alcohol, and the residue, insoluble in that vehicle, will contain the chrysophanine. This residue is purified by dissolving in water and preciptating by concentrated alcohol, until the alcohol remains uncoloured. It must be dried over sulphuric acid, and not by a fire or even a water-bath. So prepared, the chrysophanine is white, although with chrysophanic acid it constitutes the colouring principle of the preparations of senna. M. Bourgoin promises to make known its properties in a future memoir.

Chapters for Students.

CHEMICAL NOTES TO THE PHARMACOPŒIA.

BY WILLIAM A. TILDEN, D.SC. LOND.

DEMONSTRATOR OF PRACTICAL CHEMISTRY TO THE PHARMACEUTICAL SOCIETY.

PYROXYLIN. Gun Cotton.—Equal volumes of sulphuric and nitric acids (B. P. strength) are mixed and allowed to cool. The cotton to be operated upon is immersed, thoroughly wetted and left for three minutes, then transferred to a vessel of water and thoroughly washed. Finally, it is drained and dried.

The cotton, by this treatment, undergoes no change of appearance, though under the microscope the fibres appear to have shrunk. It will be found to have increased in weight. It has, in fact, exchanged two atoms of hydrogen for two atoms of NO_2, a double decomposition having occurred, which is quite analogous to the production of a nitrate by the action of nitric acid on a metallic hydrate. *E.g.* :—

$$\left.\begin{matrix}K\\H\end{matrix}\right\}O + \left.\begin{matrix}NO_2\\H\end{matrix}\right\}O = \left.\begin{matrix}K\\NO_2\end{matrix}\right\}O + \left.\begin{matrix}H\\H\end{matrix}\right\}O$$

Potassic Hydrate. Hydric Nitrate. Potassic Nitrate. Hydric Hydrate or Water.

And—

$$\left.\begin{matrix}(C_6H_7O_2)\\H_3\end{matrix}\right\}O_3 + 2\left[\left.\begin{matrix}NO_2\\H\end{matrix}\right\}O\right]$$

Cellulose. Nitric Acid.

$$= \left.\begin{matrix}(C_6H_7O_2)\\H(NO_2)_2\end{matrix}\right\}O_3 + 2\left[\left.\begin{matrix}H\\H\end{matrix}\right\}O\right]$$

Dinitro-cellulose. Water.

If nitric acid more concentrated than that of the Pharmacopœia is employed, and the immersion of the cotton prolonged, the third atom of hydrogen is also extracted, and a third atom of NO_2 introduced in its place. In this way a body more explosive is produced, but one which, being insoluble in a mixture of ether and alcohol, is unsuited to the production of collodion. On the other hand, if the nitric acid employed has been too weak, a smaller amount of hydrogen undergoes replacement, and the cotton is less explosible and also less soluble. It is important in these experiments to wet the cotton thoroughly and *uniformly*, otherwise the product does not conform to the Pharmacopœia test, and leaves, when burnt, a residue of carbon. The hydrogen of cellulose is replaceable by other acid radicles. Thus, compounds may be formed in which one, two, or three atoms of acetyl (C_2H_3O) may be substituted for one, two, or three atoms of hydrogen. These substitution products are evidently analogous to compound ethers; they are, in fact, salts. We may compare them, for instance, to the derivatives of ordinary alcohol, the difference being simply in the amount of hydrogen replaceable. In ordinary alcohol there is but one moveable atom of this kind.

C_2H_6O Alcohol.	$C_6H_{10}O_5$ Cellulose.
$C_2H_5(NO_2)O$ Nitric Ether or Nitrate of Ethyl.	$C_6H_9(NO_2)O_5$ Mononitrocellulose.
	$C_6H_8(NO_2)_2O_5$ Dinitrocellulose.
	$C_6H_7(NO_2)_3O_5$ Trinitrocellulose.
$C_2H_5(C_2H_3O)O$ Acetic Ether or Acetate of Ethyl.	$C_6H_9(C_2H_3O)O_5$ Monacetyl-cellulose.

The simplest possible formula for cellulose has been employed in the foregoing remarks; there can be little doubt, however, that the molecular weight of this compound is expressed more correctly by some multiple of $C_6H_{10}O_5$, probably by at least $C_{18}H_{30}O_{15}$. As a general rule, non-volatility, insolubility and want of crystalline character are indicative of high formulæ. Dextrin, bussorin, starch, inulin and some other substances present the same composition as cellulose; though, from the differences in their properties, they must be represented by formulæ expressive of different degrees of complexity.

CORRESPONDENCE RELATIVE TO CINCHONA CULTIVATION IN INDIA.

Letter from the SECRETARY OF STATE *to* J. ELIOT HOWARD, ESQ.

"*India Office, January 6th*, 1872.

"Sir,—I am directed by the Secretary of State for India to transmit to you a copy of a report on the examination of cinchona barks by Mr. Broughton, dated July 31st, 1871, and to request that you will favour his Grace with any remarks that may occur to you respecting any of the points upon which Mr. Broughton touches, and especially upon the species which is likely to produce the most remunerative bark for sale in the London market.

"I am, etc.,

"(Signed) H. MERIVALE.

"J. E. HOWARD, Esq."

[*Reply to be sent to the Under Secretary.*]

(Reply to the above.)

Letter from J. E. Howard, Esq., *to the Under Secretary of State for India, dated Tottenham, 16th January,* 1872.

In compliance with a request from the Secretary of State for India, dated the 6th inst., I beg to transmit the following remarks, which I have the more pleasure in doing, as I can now report more favourably of the results of the cultivation than at any previous period of the undertaking.

In reference to "the species which is likely to produce the most remunerative bark for sale in the London market," I will remark, in the first place, on that which has been the most largely cultivated, the red bark tree, or *Cinchona succirubra*.

Two circumstances especially recommended this sort for cultivation; its free propagation and growth, and the very high price paid for the mature bark of this sort in the London market.

I have never been favourable to the almost exclusive preference paid to this sort by many cultivators. I have shown,* in a recent examination of two trees sent me by the Indian Government (one of this sort and the other of *C. officinalis*), that the more rapid development of the former species did not secure a comparative advantage as to the production of alkaloid, since the quinine in the latter kind exists in a more abundant quantity as to its percentage in the bark, and also in a much purer state than in the former (the *C. succirubra*).

I am happy to be able, in this view of the subject, to coincide entirely with the published report of Mr. Broughton, whose more extended opportunities of observation supplement the more limited character of my own personal investigation. In reference to the price of the bark I remarked, in my report dated 15th June, 1864, that "the very high price of between 8*s*. and 9*s*. which has been recently paid for red bark in this market, applies only to those pieces of bark from the trunk which possess from their age a peculiarly bright appearance."

A further recommendation of the *C. succirubra* to notice exists in the fact that it gives on the whole a very large product of alkaloid, and also of the cinchona red, so that it may be called the most *cinchonaceous* of all the *Cinchonæ*. Against this must be set the fact that, in connection with the gradual oxidation of the cincho-tannic acid and the production of the cinchona red, there is a gradual diminution and waste of the alkaloids, so that the bark does not really improve by age, but the contrary. This is the peculiar habit of the species, and it would seem, from the accompanying report of Mr. Broughton, that the effect of this idiosyncrasy is already beginning to be apparent.†

It will be noticed that, whilst the *total alkaloids* have risen from 6·74 per cent. in 1868 to 7·85 in 1871, the "sulphate of quinine obtained crystallized," which (to a large extent) marks the value of the bark in the eyes of the quinine manufacturer, has steadily declined from 2·21 per cent. in 1868 to 1·15 per cent. in 1871. The sulphate of cinchonidine obtained crystallized has, in the meantime, risen from 3·85 per cent. in 1868 to 4·30 per cent. in 1871. It will immediately occur that this is, to a certain extent, a counterpoise, as no doubt it is, but to a certain extent only, as will be explained hereafter.

It is needful also to remark that the *waste* of alkaloid, which has been apparent to the writer in the examination of many specimens of South American bark of the age of perhaps one or two centuries, has not yet taken place in these still young Indian specimens, and also that it is open to question whether the apparent conversion of quinine into cinchonidine is due to deoxidation,* which increases also the proportion of cinchonine, or to some other cause.

In my report, dated 1st August, 1865, I remarked, in reference to the preponderating product of cinchonidine, which I could not help foreseeing,—"This difficulty must be looked steadily in the face, and I would suggest that it may be obviated either by a change being wrought in the opinion of the medical world as to the value of cinchonidine as a medicine, or by the plant being encouraged to produce quinine instead of cinchonidine."

The Secretary of State for India (Sir Charles Wood) lost no time in acting on the first of these suggestions, and consulted Sir Ranald Martin,† who entered cordially into the subject and approved of both ideas. The result was, through Sir Charles Wood's recommendation to the Governor-General of India,‡ the appointment of a medical commission, whose labours have been most advantageous. It is not for me to speak of their value to medical science, but to show the bearing of the report of this commission on the cultivation of the *C. succirubra*, as its outcome differs somewhat from what might have been anticipated.

The commission has shown that all the alkaloids are to be relied upon more or less in the cure of intermittent fever, or, in the language of the Report, "that they form a very valuable class of therapeutic agents," and (taking the order of the instructions sent to medical officers) they consider them to be—

1. Febrifuges, anti-periodics and tonics.
2. Their general effects are similar to those of quinine, though perhaps in an inferior degree.
3. As variously estimated, they possess the same effects as quinine, to the extent of one-half or two-thirds.
4. They are very efficacious in treating the common fever of the country and disordered digestion, etc. etc.
5. Their relative value seems to be—
   1. Quinine.
   2. Quinidine.
   3. Cinchonidine } about equal.
      Cinchonine }
6. Their proper doses are—

Quinine	from 3 to 20 grains.
Quinidine . . .	„ 5 „ 20 „
Cinchonidine . .	„ 7 „ 20 „
Cinchonine . . .	„ 7 „ 20 „

It is clear that quinine keeps its long-maintained and acknowledged supremacy, and that next in order of merit we must place quinidine; but *quinidine* (except in some rare and quite exceptional cases) is what *C. succirubra* does *not* produce.

Then cinchonidine and cinchonine are looked upon as of equal efficacy, if we read the report aright.

There are other circumstances which lead to quinidine maintaining its price, and it seems to be, and probably will continue, the favourite next to quinine. But next to quinidine comes in, not cinchonidine, but cinchonine, the obvious reason being that it can be delivered at a lower price; in addition to which it is (at least in one of its combinations) a more convenient medicine to prescribe.

So we have, after all, cinchonidine rather falling behind in the race, and if the effect of this on the cultivation of *C. succirubra* be well considered, it will tend to confirm our doubts about the result.

We then come to the second of my suggestions. Cannot the *C. succirubra* be encouraged to grow quinine instead of cinchonidine? We have seen that its tendency is increasingly the reverse.

* Pharmaceutical Journal, November, 1871.

† *i.e.*, in the *present change*, to be followed by *future waste* in the alkaloids.

* In connection with the cincho-tannic acid taking from the alkaloids, oxygen, for which it has very strong affinity. Both the alkaloids contain a smaller amount of oxygen than quinine possesses.

† "Return," 18th June, 1866, p. 136.

‡ "Return," p. 316. Letter dated 30th September, 1865.

How can we alter this? The answer is certainly not alone by *mossing*, as is strikingly shown by an analysis of Mr. Broughton's now before me, the unmossed bark yielding 2·18 per cent. sulph. cinchonidine, and the *old mossed* bark of the same parcel of *C. succirubra* not less than 4·66 per cent., whilst the quinine is less in this latter.

There remains the process of the re-formation of the bark over surfaces from which it had been removed. This gives rise to the production of lax cellular tissue, full of quinine (which I have described anatomically and chemically in 'Quinology of the East India Plantations'). Mr. Broughton admits this fact,* and it is doubtless familiar to Mr. M'Ivor, so that I am at a loss to understand why this plan is not pursued to a greater extent than appears to be the case. I have obtained large percentages of quinine from bark of this description, more than sufficient to repay the extra cost, unless there are circumstances unknown to me which tend greatly to augment the cost of the operation, or to render it, from some cause, undesirable.

I have now stated the objections to the cultivation of *C. succirubra*. On the other hand, I am bound to say that its inherent good qualities have secured it a favourable reception in the English market, and a price which may probably be found satisfactory to the producers.

At a quite recent sale of bark grown on the Government plantations at Ootacamund, the "old mossed *succirubra*" brought 2*s*. 3*d*. per lb., the "small mossed *succirubra*," 2*s*. 6*d*. per lb., the "unmossed *succirubra* realized 2*s*. 10*d*. per lb. These were all sold (as far as is known) for pharmaceutical purposes, whilst one parcel of "unmossed and old mossed *succirubra*" was sold for the extraction of quinine, and obtained 2*s*. 7*d*. per lb.

It is a favourable feature that the attention of leading druggists in London is being aroused to the merit of the article, and that the prices above named were the result of the competition of purchasers from the Continent with these in London.

I suggested to the Government in June, 1854, that the bark of the small branches might be advantageously sold for pharmaceutical preparations, and it now seems as if the bark of the whole tree would be welcome for the purpose. On the review of all that is apparent at present, I do not think it wise to rest the success of the cultivation on this one species. It cannot be looked upon as the quinine tree of the future.

I come next in order to the *C. officinalis* and its varieties, representing in India the "Loxa" or "crown barks," which used to be supplied from South America to the European markets.

These latter may now be looked upon as belonging to the past, as none are forwarded at present from Loxa, and it is not very probable that the *inertia* of the people of those parts will be overcome so far as to cultivate them, and thus replace the worked-out forests. It is therefore a most fortunate circumstance that all, or nearly all, the varieties should have found so congenial a home as India.

There have now been several importations of the "*officinalis*" barks from different plantations in the East, and I can speak well of all I have seen, and that without any of those reservations which attach themselves to the former species. I have no doubt that these barks will improve with age, and they already command a price equal in some cases to that of *calisaya*. That of the variety *angustifolia*, if it can be produced equal to the specimen analysed by Mr. Broughton and myself, would of course realize a much larger amount. In reference to this sort, Mr. Broughton wrote to me in April, 1869, that "the flower did not appear to differ from the other *officinalis* blossom," and in July of the same year, "some further experience quite supports your views that it is a *crown bark*. I can now trace all gradations into the *Bonplandiana* type." I may add, that having received dried specimens which were gathered in the latter part of 1868 at Ootacamund and sent home by Mr. Batcock, I sowed some of the seed remaining in the capsules of one of these, which is marked "No. 6 (?), var. *C. officinalis*, var. *crispa*" (the duplicate of which, as of the other numbers, is in the Royal Museum at Kew). This appears to be the same as Mr. Batcock's "No. 4, *C. officinalis* (??), *crispa*," but differing widely from the real *crispa* of Tafalla.

From these seeds I obtained several plants, of which two remain. One of these is more like the parent, but the other plant represents exactly the "No. 11," or var. *angustifolia*. It appears to be a freely growing sort, being at this time five feet in height and having nearly a dozen small branches. This, for a three years' growth (under all disadvantages of cultivation under glass), promises well. Mr. M'Ivor wrote me, under date 29th June, 1869, "we are now propagating the *lanceolate officinalis* from cuttings as fast as we can. It is, I believe, only a variety, and consequently it will not come true from seeds; and therefore the only way to get up a large stock quite true is by cuttings and grafts." In confirmation of its only being a variety, Mr. Broughton sent me specimens, of which he writes, under date October, 1869, "I have a set of [*crispa* ?] specimens just ready to send you. Those marked A, B, C, D, E, are all from *crispa* seed. You will, I think, see a gradation in all characters between two marked types. I want your opinion on these."

These very well selected specimens nearly bridged over the interval between the var. *Bonplandiana* and the var. *angustifolia*, to which latter I should assign C, D, and E, as differing by no specific tokens from the No. 4 and No. 6 above, nor yet from No. 7, which is termed "the strong growing variety." A and B are of a separate type.

I should like to take one further step to establish the specific identity of these forms,—to sow the seed from No. 11, and see whether it would not originate the other sorts. In the meantime it remains to propagate diligently the var. *angustifolia* by layers and cuttings, as Mr. M'Ivor was already doing in 1869. By this time the plants thus raised may have amounted to a large number, for the plant of *C. officinalis* (raised from seed from Uritusinga in 1859) which I had the honour to present to the Indian Government, gave rise, under the skilful care of Mr. M'Ivor, to many thousands in the same period; and the last I heard was that he hoped to plant sixty acres from that one tree. Now, it is easy to understand how valuable a plantation in suitable soil and climate of the var. *angustifolia* would be; but if this seems scarcely attainable it might, at all events, be easy to intersperse these among closely set plants of the *C. officinalis* (in its other varieties), and to remove these latter year by year as required, cutting them down cleanly to the root and sending in the bark to the English market. This would pay all expenses, and then the more valuable trees might in the meantime acquire a large size, whilst between them an undergrowth of offshoots from the cut-down stems would be coming on for fresh cutting. I mention this plan in connection with the *C. officinalis* especially, because in these crown barks the very youngest shoots that could be peeled have often been sold and even preferred by the trade.

It will be seen how this bears upon the question of quick return of capital by some such plan as the above. There is no fear that the bark of these varieties of *C. officinalis* should deteriorate with age, so that the trees left might in time rival those of the Bolivian forests; in these there have been found specimens both of *calisaya* and *lancifolia*, yielding as much as 5 cwt. of bark each; but it is not our own generation that will see such trees in India.

I have not much to remark in reference to the remaining varieties of *C. officinalis*. I have quite recently

* "Return" of 9th August, 1870, page 195.

met* with the *Amarilla del Rey* (as well as the *Colorada del Rey*), once celebrated Loxa barks. These seem quite as good (chemically viewed) as their originals in South America, and might easily be so gathered as to please the eye of the druggists here. In the meantime I can entirely confirm the opinion expressed by Mr. Broughton, that this sort (the *officinalis* in its varieties) is "especially suited for export to Europe" for the purposes of quinine manufacture. I must also add that these barks are now required to fill up the vacancy occasioned by the cessation of the supply of the true Loxa, or crown barks. The cessation, if not *absolute*, is *practically* complete, and is supplemented by the importation of miserable products *viâ* Guayaquil.

The species standing third in importance, according to the report, is that of *C. calisaya*, of which the No. 5 form appears to be the one to be encouraged. Considering the acknowledged superiority of these barks in South America, it must occur that there is something yet to be learned about them in India, causing them to take a higher place than the third rank. The No. 5 form is not improbably the one found by Don. P. Rada, in the east of Bolivia, and described by me in the 'Journal of Botany' in 1869. In that case it would form trees of from 120 to 150 feet in height, and still produce bark of fine quality. The analysis of Mr. Broughton shows a very promising kind.

It will be needful to guard the cultivators against the inferior sorts, which (however they may be arranged botanically) will assuredly disappoint their expectations.

I am glad to notice that the grey bark trees, or the *C. micrantha* and *C. Peruviana*,† have been, to some extent, encouraged by Government, as these trees furnish cinchonine in abundance and of a good quality; and this alkaloid is increasing so much in consumption that it will some day become important to have a readily available source to depend upon for its supply.

The Pitayo trees, of which there exists now a complete collection at Ootacamund (through the last mission of Cross), should, I think, be encouraged, as they not only furnish a good material for the extraction of quinine, but also of quinidine, which is coming into favour in some quarters.

In conclusion, I wish to add some remarks to dispel the fears which seem to be entertained by cultivators, that an excessive supply from India will so glut the market as to cause the prices to fall too low to be remunerative. I do not see any reason to fear this with reference to *really good barks*, which must always repay well the expense bestowed on their cultivation. There is no medicine in the world to rival quinine in its efficacy and in the extent of its consumption, and there is no probability that any artificially-formed product will ever take its place.

Then, as to the South American forests, it is clear that these cannot compete with skilfully cultivated plantations in India. The very cost of transport, if nothing else, would hinder this.

It remains that the planters should not over supply the demands of the world; this, indeed, is a *possibility*, but one so remote that it may be dismissed from all thought for at least the present generation, and the range of altitude above the sea-level and of climate under which the cinchona can be profitably grown are at best extremely limited, as Mr. Broughton's reports abundantly show, and it will be found eventually that the really productive plantations are not too numerous for profit.

ACTION OF SUNLIGHT ON OLIVE OIL.

BY LUIGI MOSCHINI.‡

Olive oil, in its natural state, contains in solution a yellowish substance which, when the oil is treated with acids or with caustic soda, gives rise to the well-known greenish coloration. By exposure to sunshine this colouring matter is essentially altered, the oil being thereby decolorized and no longer exhibiting a greenish colour when treated with the reagents above mentioned. Moreover, other changes take place at the same time in the constituents of the oil, the olein in particular being greatly altered, and acquiring the fundamental property of *elaidin*, namely, that of not solidifying in contact with nitrate of mercury mixed with nitrous products. At the same time free acids are formed, and the oil acquires a rancid taste and odour.

From these results it appears that the method, suggested by some authors, of distinguishing olive oil from other oils by means of sulphuric acid, caustic soda and nitrate of mercury, can be depended upon only when the oil is in its natural state, not altered by exposure to sunshine.—*Journal of the Chemical Society.*

* In importations from India.

† Also *C. nitida.*

‡ Gazzetta chimica Italiana, i. 580.

NOTE ON A NEW SCOTCH ACIDULOUS CHALYBEATE MINERAL WATER.

BY JAMES DEWAR, F.R.S.E.

It is generally known that this country is extremely deficient in well-marked chalybeate waters. Plenty of natural waters, containing small proportions of iron, are to be met with in the United Kingdom; but, with the exception of those of Tunbridge Wells, Harrogate, Sandrock (Isle of Wight), Heartfell, near Moffat, and Vicarsbridge, in the vicinity of Dollar, they contrast very unfavourably with those of the numerous spas of the continent of Europe. If we restrict ourselves to an examination of the chemical characters of the above-mentioned Scotch chalybeates, we observe that the iron is present in large quantities in the form of sulphate, along with sulphate of alumina, on which account they are more nauseous to invalids, and are at the present time rather unpopular.

Recently my brother, Dr. Alexander Dewar, Melrose, sent me for analysis a sample of a new well water, whose peculiarity had previously attracted his attention. A chemical examination of the water in question showed it to be a well-defined acidulous chalybeate, unusually rich in carbonate of iron. The following are the analytical details. (As the surface-water gets access at present, a very exhaustive analysis appeared unnecessary):—

	Grs. per gall.
Carbonate of iron	17·5
Alumina	1·8
Silica	8·5
Sulphate of magnesia	7·8
Chloride of calcium	16·0
Carbonate of calcium	4·1
Alkaline chlorides	11·4
	67·1

Carbonic acid gas per gallon 40 cubic inches.

With the exception of the celebrated "Dr. Muspratt's chalybeate," at Harrogate, which contains 10·8 grains per gallon of carbonate of iron, along with 16·0 grains of protochloride, I do not know of any natural water in this country containing such a large proportion of iron in the form of carbonate. And it is to be observed that the water is not associated with a large quantity of other salts.

The well whence the foregoing sample was taken has not been long sunk, and its water is perfectly different from all of those in its immediate vicinity. Should it maintain its present character, I have no doubt that, judging from its own qualities, as well as from its favourable climatic situation, along with the general interest attached to the locality, this chalybeate is certain to recommend itself to the medical profession.—*Chemical News.*

THE CHICAGO COLLEGE FUND.

The following is a list of the subscriptions promised up to March 8th, 1872.

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Parcels of Books, Specimens of Chemicals, or Articles of the Materia Medica, Apparatus and Subscriptions may be sent to Professor Attfield, 17, Bloomsbury Square, London, W.C. Cheques, crossed "London and Westminster Bank," and Post-Office Orders, drawn for "High Holborn," may be made payable to John Attfield. All Donations will be acknowledged in the Pharmaceutical Journal.

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Pratt, G. W. ,,	0	5	0	Thatcher, —, Ashton	0	2	0
Walton, — ,,	0	5	0	Ratcliffe, — ,,	0	2	0
Jones, — ,,	0	5	0	Johnson, T., Stockport	0	2	0
Butterworth, L., Ashton	0	5	0	Buckley, Mrs., Oldham	0	2	0
Wilkinson, G., Manchester	0	5	0	Bell, Mrs., Manchester	0	2	0
Walsh, E. ,,	0	5	0	Wilkinson, A. ,,	0	1	0
Myott, W., Oldham	0	5	0	Howe, G. W. ,,	0	1	0
Parkinson, W., Oldham	0	5	0	Kershawe, — ,,	0	1	0
Clarke, J., Manchester	0	5	0	Ridley, E. H. ,,	0	1	0
Burton, R. ,,	0	5	0	Gibson, J. C. ,,	0	1	0
Taylor, F. ,,	0	5	0	Payne, H. ,,	0	1	0
Williams, F. P. ,,	0	5	0	Eardley, T. F. ,,	0	1	0
Glover, J. S., Ashton	0	5	0	Hallas, D. N. ,,	0	1	0
Beard, J., Manchester	0	5	0	Humphries, J., Ashton	0	1	0
Pattinson, J. H. ,,	0	5	0	Crowther, W., Manchester	0	1	0
Mayor, D. ,,	0	5	0	Walker, Mrs., Oldham	0	1	0
Bushby, T. ,,	0	5	0	Whalley, — ,,	0	1	0
Edwards, G. ,,	0	5	0	Burton, A. ,,	0	1	0
Pickup, R. L. ,,	0	5	0	T. P., Manchester	0	1	0
Payne & Chapman ,,	0	5	0	Andrews, — ,,	0	1	0
Alcock, Messrs. ,,	0	5	0	Snooks, — ,,	0	1	0
Twemlow, — ,,	0	5	0	Fuller, — ,,	0	1	0
Wild, F. ,,	0	5	0	Skelton, — ,,	0	1	0
Terry, T. ,,	0	5	0	T. R. ,,	0	1	0
Shenton, — ,,	0	5	0				
R. T. ,,	0	5	0	Total	£52	10	6
Gill, J. W. ,,	0	5	0				

The Pharmaceutical Journal.

SATURDAY, MARCH 9, 1872.

Communications for this Journal, and books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*
Instructions from Members and Associates respecting the transmission of the Journal should be sent to ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*
Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

LEGISLATION AFFECTING THE SALE OF FOOD AND DRUGS.

IT will be seen by reference to this week's Parliamentary report that the second reading of the Bill introduced by Messrs. MUNTZ, WHITWELL and DIXON was merely formal, and that further progress with it has now been made subject to the passing of the Government Public Health Bill, into which have been incorporated some clauses of the former. As regards food or drink, it is provided that, adopting the existing Food Adulteration Act, the penalty to be imposed in respect of adulteration shall be augmented from a maximum of five pounds to a sum not exceeding *twenty* pounds.

In accordance with Mr. STANSFELD's announcement some time since, no reference is made in the Public Health Act to the adulteration of drugs, which is comprised in Mr. MUNTZ's Bill; but Mr. MUNTZ has given notice of motion to introduce an amendment that would make this measure apply to drugs in the same way as to food. However, the adoption of his amendment would not alter the state of the law in regard to this matter, otherwise than in the amount of the maximum penalty being augmented from five to twenty pounds, for the 24th section of the Pharmacy Act, 1868, already provides that the Adulteration of Food Act shall extend to all articles usually taken or sold as medicines.

In both the Bills now before Parliament the principle of limiting the definition of "adulteration" to the admixture of poisonous or injurious materials with articles of food, etc., is still adhered to. This is, at any rate, implied in the Public Health Act, by the provision that the sale of articles of food proved to be *unwholesome* is to render the seller subject to a penalty; and in Mr. MUNTZ's Bill it is specially stated that the selling of articles containing injurious admixtures is the "fraud" from which it is intended to protect her MAJESTY's subjects. The inappropriateness of this definition, as regards any sufficient means of dealing with adulteration, has already been pointed out in this Journal; and to those who hold this opinion, the self-congratulatory remarks with which Mr. MUNTZ introduced the motion for the second reading of his Bill, will appear to convey decided satire upon the views not long since expressed by Mr. BRIGHT.

Even assuming the allegations of the preamble to Mr. MUNTZ's Bill to be well founded, there is still room for much objection to it as regards the means by which its provisions are to be enforced; and this remark applies also to the Public Health Bill, especially as regards the appointment of analysts. This is altogether optional, and the medical officer of health is the only officer that local authorities are bound to appoint. It is to be hoped that this point will receive the attention it deserves, and that the fitness of the persons appointed as analysts will be borne in mind, as well as the suggestions recently offered in this Journal on that subject.

DR. MAXWELL SIMPSON has been appointed to succeed the late Professor BLYTH in the Chair of Chemistry at Queen's College, Cork.

THE President of the Medical Society of London, Dr. ANDREW CLARK, entertained the Fellows of the Society, with a large party of the medical profession and of ladies, at a conversazione at the Queen's Concert Rooms, on Tuesday evening last. The band of the Royal Artillery was in attendance, and the rooms presented a very brilliant appearance.

IT is stated in the *British Medical Journal* that the British Medical and Social Science Associations are about to take active measures for considering the best means for exerting parliamentary influence in connection with the Public Health Bills now before Parliament, and a notice has been issued requesting members of the British Medical Association having personal relations with Members of Parliament to exert themselves with the same object.

AT a recent meeting of the Académie de Médecine, M. LEFORT, in giving the results of his experiments on the presence of atropia in the various parts of the belladonna plant, stated that belladonna root of seven or eight years' growth contains one-half less atropia than the root of two or four years', and he therefore concluded that the leaves could be employed with greater advantage in obtaining atropia.

As the result of some experiments undertaken for the *British Medical Journal*, Mr. WANKLYN reports that the filtration of drinking water through a porous filter exercises a very powerful chemical action on any organic nitrogenous matter contained in it. This action Mr. WANKLYN likens to that of boiling alkaline permanganate, so rapid and so powerful is it. Water containing nitrogenous matter was put into a filter, and the ammonia resulting from the decomposition of the organic mater was obtained. The investigation was made with a silicated carbon filter.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

March 6th, 1872.

MR. A. F. HASELDEN, F.L.S., PRESIDENT, IN THE CHAIR.

MR. EDWARDS, VICE-PRESIDENT.

Present—Messrs. Atherton, Betty, Bottle, Brown, Carr, Frazer, Greenish, Hills, Savage, Shaw, Stoddart, Sutton and Williams.

The minutes of the last meeting were read and confirmed.

The President reported that cards of admission to St. Paul's Cathedral on the occasion of the Thanksgiving for the recovery of H.R.H. the Prince of Wales had been received from the Lord Chamberlain, and that the Vice-President and himself had had the honour of attending.

The Report of the Finance Committee was presented, showing on the General Fund Account a balance of . . . . £627. 14*s*. 10*d*.
And submitting for payment, accounts amounting to . . . . £575. 8*s*. 7*d*.

Resolved—That the Report be received and adopted and payments made.

On the Benevolent Fund Account, there was a balance in hand of . . . . £281. 2*s*. 5*d*.

The Report of the Benevolent Fund Committee was received and adopted.

A letter was read from the Treasurer of the Chemists' Ball Committee, enclosing a cheque for twenty guineas, as a subscription to the Benevolent Fund.

Resolved—That the thanks of the Society be given to the Chemists' Ball Committee for the subscription of twenty guineas to the Benevolent Fund.

The Report of the House Committee was received and adopted.

North British Branch.

The President read a letter from Mr. Mackay, enclosing an offer of some new premises in St. Giles's Street, Edinburgh, for the use of the North British Branch at a rental of £85 per annum, on lease for seven years. Mr. Mackay stated that the rent and taxes together would not exceed £100. The Secretary laid before the Council a plan of the rooms.

Mr. Shaw thought it was important that the rooms should be taken in the name of the Society.

The President said the rooms appeared very suitable, especially with two or three alterations, which it was suggested might be made in the finishing of the premises.

Mr. Shaw thought it would be better if the premises could be taken for a longer term.

Mr. Frazer said that property in Edinburgh was so rapidly enhancing in value that proprietors would not grant longer leases than for seven years. He could not get his own premises for a longer term.

Mr. Savage said it would be necessary in that case to take care that the fittings and cases should be provided with backs, so as to be available for use elsewhere if necessary.

Resolved—That the rooms proposed to be taken by Mr. Mackay in the name of the Society for the purposes of the North British Branch be approved.

The Report of the Library, Museum and Laboratory Committee was received and adopted, and the following books recommended for the Library were ordered to be purchased:—

Schellen's Spectrum Analysis. By J. and C. Lassell and W. Huggins.
Bernays' Notes for Students in Chemistry.
Pereira's Materia Medica. By Professors Bentley and Redwood (two copies).
Letheby's Food; its Varieties, etc.
Oliver's First Book of Indian Botany.
Ganot's Physics. By E. Atkinson.

Resolved—That the 'Historical Sketch of the Progress of Pharmacy in Great Britain,' by the late Jacob Bell [the copyright of which was presented to the Society by Mr. Hills at the last meeting of the Council], be reprinted, with additions to the present time; and that the President, Mr. Sandford and Professor Redwood be invited to re-edit the work, taking the assistance of other contributors if they deem it necessary.

That the Curator of the Museum be requested to take steps for forming an Herbarium suitable for the use of Students.

Resolved—That the Journal and Transactions of the Society be forwarded regularly, as published, to the "Orleans County Society of Natural Sciences," in exchange for the "Archives of Science" and Transactions of that Society.

M. Dorvault having applied on the behalf of the Pharmacie Centrale de France for fourteen volumes and thirty-nine numbers of the Pharmaceutical Journal, necessary to complete the series in the library of that institution, it was

Resolved—That M. Dorvault's request be complied with.

The President read the following letter from Dr. Tilden:—

"*Pharmaceutical Society of Great Britain*,
"17, *Bloomsbury Square, W.C.*
"*Laboratory Department*,
"*5th March*, 1872.

"My dear Sir,—You are probably aware that for some time past I have published, at intervals, short articles in the Pharmaceutical Journal, under the title of 'Chapters for Students.'

"The series illustrating the chemical processes of the Pharmacopœia will be completed with the conclusion of the present volume of the Journal. It has been represented to me that, when complete, their usefulness might be increased, if collated and published in an independent form.

"Before taking any steps in this matter, I feel it my duty to inform the Council of my desire to comply with this suggestion, and to request their permission so to do, as I am led to believe that, with certain modifications and additions, the substance of these articles would form a useful text-book for students.

"I may add that the work will not appear until the series has been completed in the Journal.

"I am, dear Sir, yours very truly,
"William A. Tilden.

"*Adolphus F. Haselden, Esq.*,
"*President of the Pharmaceutical Society*
"*of Great Britain.*"

Resolved—That Dr. Tilden's letter, now read, be entered on the minutes, and that his application be complied with.

Resolved—That a Conversazione be held on Wednesday, the 15th May, and that the Secretary be instructed to apply to the Lords of her Majesty's Council on Education for permission to use the South Kensington Museum on the evening of that day for such purpose.

Resolved—That the Report of the Evening Meetings Committee be received.

The Report of the Parliamentary Committee was received and adopted.

Mr. Savage drew attention to the Adulteration of Food, Drugs, etc., Bill now before Parliament, and a discussion ensued thereon, in which Messrs. Brown, Greenish, Betty, Hills and Williams took part. It was determined that the necessary steps should be taken for watching its progress.

REPORTS OF THE BOARD OF EXAMINERS.

February, 1872.

ENGLAND AND WALES.

Examination.	Candidates examined.	Candidates passed.	Candidates failed.
Major	6	2	4
Minor	31	25	6
Modified	37	26	11
	74	53	21

Eight certificates were received in lieu of the Preliminary Examination, namely, University of Cambridge, 2; University of London, 1; University of Durham, 1; Committee of Council on Education, 1; College of Preceptors, 3.

A recommendation of the Board of Examiners was considered, suggesting the desirability of holding the Preliminary examination at the same hour throughout the Country, and it was

Resolved—That the Preliminary examinations be held in London and the Country on the same day and at the same hour, simultaneously, and that twelve o'clock (noon) be the time fixed.

Resolved—That the following, being duly registered as Pharmaceutical Chemists, be respectively granted diplomas stamped with the seal of the Society:—

Goodliffe, George .... Cambridge.
Pratt, Henry James .... Thirsk.

Resolved—That the following Pharmaceutical Chemists be and are hereby elected Members of the Society:—

Beedzler, John .... Chesham St., London, S.W.
Byles, James Henry .... Hackney Rd., London, E.
Ferguson, Wm. Kennedy .... Leeds.
Goodliffe, George .... Cambridge.
Pratt, Henry James .... Thirsk.

Resolved—That the following Registered Chemists and Druggists be elected "Members":—

Burdge, Samuel .... Bristol.
Cubley, George Arthur ...... Sheffield.
Cundall, Robert .... Pocklington.
Horsfield, John Napoleon .... Leeds.
Hudson, Fretwell .... Sheffield.
Jervis, William .... Sheffield.
Le Page, John Fisher .... Brandon.
Le Page, William .... Guernsey.
Redfern, Tom .... Penrith.
Rodger, John .... Inverary.
Schibild, John Shields .... Old Kent Road, London, S.E.
Williams, William John ...... Llandilo.

Resolved—That the following having passed their respective examinations, be elected "Associates in Business."

MINOR.

Ellis, George .... Southport.
Prime, Thomas Robert ...... Upper Norwood.
While, William John .... Merthyr Tydvil.
Young, Richard .... Liskeard.

MODIFIED.

Anderson, George L. .... Kirkintilloch.
Bennett, Joseph .... Bristol.
Cronshaw, Christopher ...... Over Darwen.
Foden, Joel .... Altrincham.
Hartley, William Henry ...... Leek.
Mitchell, Marcus .... London.
Moore, John Shipp .... London.
Nixon, Joseph .... Bolton.
Rawson, Frederick George .... Lincoln.
Taylor, Walter .... Nottingham.
Whaley, Edward .... Kingston-on-Thames.

Resolved—That the following, having passed their respective examinations, be elected "Associates":—

MINOR.

Ashworth, Amos .... London.
Badcock, Daniel .... Barnard Castle.
Barron, Alexander .... Aberdeen.
Bolton, Charles Alfred ...... Nottingham.
Cowdery, Frederic .... Reading.
Downes, Charles Hagger .... London.
George, John .... Kidderminster.
Greatrex, Thomas James .... London.
Hicks, William Thomas ...... Ipswich.
Horrod, Thomas Samuel ...... Lincoln.
Jones, William .... Louth.
Luke, Richard Samuel ...... Plymouth.
Newbery, Albert Edward .... Exeter.
Parson, Henry James .... Birmingham.
Rigby, James .... Liverpool.
Saul, William Benjamin ...... Taunton.
Tamplin, Geo. Wm. Dunlop H. Bristol.
Walker, Joseph .... Dresden.
Wilson, Charles Alfred ...... Twyford.

MODIFIED.

Backhouse, Headley Noah .... London.
Bush, William .... Islington.
Clayton, Daniel Thomas ...... Boston.
Harrop, William Hutchinson.. Rochdale.
Higgins, William .... London.
Jones, Frederic .... London.
Parkin, Charles .... Stockton.
Tijou, Tom .... Kettering.
Wallis, George .... Matlock Bridge.
Woolley, Henry James ...... London.

EXAMINATIONS IN EDINBURGH.

March 5th, 1872.

MAJOR.

The following candidate was examined, and passed, and declared duly qualified to be registered as a "Pharmaceutical Chemist":—

*Kemp, John .... Inverness.

MINOR.

Three candidates were examined; of these, *two* failed. The following passed, and was declared duly qualified to be registered as a "Chemist and Druggist":—

*Modlen, Robert .... Edinburgh.

MODIFIED.

Three candidates were examined; of these, *two* failed. The following passed, and was declared duly qualified to be registered as a "Chemist and Druggist":—

Guest, George Frederick ...... London.

* Passed with honours.

BENEVOLENT FUND.

Subscriptions and Donations Received during February, 1872.

SUBSCRIPTIONS.

London.

	£.	s.	d.
Best, James, 11, Jonson's Place, Harrow Road	0	10	6
Billing, Thomas, 143, New Bond Street	0	10	6
Bird, William L., 42, Castle Street East	1	1	0
Bourdas, Isaiah, 7, Pont Street, Belgrave Square	1	1	0
Bourdas, Isaiah, jun., 48, Belgrave Road	1	1	0
Bourdas, John, 7, Pont Street, Belgrave Square	1	1	0
Bowden, Edward and A., 13, Charles Street, St. James's	1	1	0
Broad, John, Rise House, Hornsey Rise	0	10	6
Bromley, Richard M., 3, Beckenham Place, Denmark Hill	0	10	6
Bullen, Thomas, 13, Hereford Road, Bayswater	0	10	6
Chemists' Ball, The Committee of the	21	0	0
Corbyn and Co., 300, High Holborn	1	1	0
Croyden, Charles, 37, Wigmore Street	0	10	6
Davenport, John T., 33, Great Russell Street	2	2	0
Dinneford and Co., 172, New Bond Street	2	2	0
Eve, Charles, High Street, Hampstead	0	10	6
Faulconer, Robert S., 270, Walworth Road	1	1	0
Fisher and Haselden, 18, Conduit Street, Bond Street	1	1	0
Forrest, Richard, 20, Cork Street, Bond Street	1	1	0
Gaunt and Fuller, 221, Union Street, Southwark	0	10	6
Glover, George, 19, Goodge Street	1	1	0
Goodwin, John, Lower Clapton	1	1	0
Gristock, Thomas, 42, South Street, Manchester Square	1	1	0
Holroyd, William H., 31, Duke Street, St. James's	1	1	0
Hopkin, William King, 10, New Cavendish Street	1	1	0
Horncastle, John, 17, Craven Road	0	10	6
Howell, Maurice, 61, High Street, Peckham	0	10	6
Hudson, Robert T., 102, Lothian Road, North Brixton	0	5	0
Hyslop, John C., 39, Church Street, Marylebone	0	10	6
Jacks, Ebenezer, 161, Gower Street	0	10	6
Jeynes, George W., 62, Princess Street, Edgware Road	0	5	0
Jones, William O., 34, Cambridge Terrace, Cornwall Road	0	5	0
Kernot, George Charles, Chrisp Street, Poplar	0	10	6
Kirkman, Charles J., 19, Trafalgar Road, Old Kent Road	0	10	6
Lidwell, Joshua E., 130, High Street, Notting Hill	0	10	6
Linford, John S., 146, Holborn Bars	0	10	6
Long, Henry, 48, High Street, Notting Hill	1	1	0
Maitland, John, 10, Chester Place, Hyde Park	1	1	0
Matthews, William, 12, Wigmore Street	0	10	6
McCulloch, Frederick, 13, Hart Street, Covent Garden	1	1	0
Meggeson, George	1	1	0
Pidduck, John, 11, Bridge Terrace, Harrow Road	0	10	6
Plummer, George, 185, High Street, Peckham	1	1	0
Radermacher, Charles John, 6, Ellington Street, Islington	1	1	0
Richardson, George, 12, Norland Place, Notting Hill	0	10	6
Roach, Pope, 8, St. James's Street	1	1	0
Robbins, John, and Co., 372, Oxford Street	1	1	0
Rose, Alfred, 441, Edgware Road	0	10	6
Rowson, Henry, 2, Chichester Street	1	1	0
Sandford, George W., 47, Piccadilly	2	2	0
Slipper, James, 86, Leather Lane	0	10	6
Smith, William F., 280, Walworth Road	1	1	0
Starkie, Richard S., 4, Strand	1	1	0
Stevenson, William L., 165, Edgware Road	0	10	6
Stoneham, Philip, 45, Craven Road	0	10	6
Taylor, Matthew, Rye Lane, Peckham	0	10	6
Taylor, Thomas, 81, High Street, Peckham	0	10	6
Tomlinson, Thomas, 6, Lower Seymour Street	1	1	0
Trotman, Alfred C., 16, Cambridge Street, Hyde Park	0	10	6
Weston, Samuel John, 151, Westbourne Terrace	1	1	0
Whitburn, Augustus R., 174, Regent Street	0	10	6
Wilkinson, Thomas, 270, Regent Street	1	1	0
Williams, John, 10, New Cavendish Street	1	1	0
Willows, Jesse, 101, High Holborn	1	1	0
Wise, Walter, 43, Duke Street, Manchester Square	0	10	6
"W. T. C."	0	10	6

Country.

	£.	s.	d.
Addiscombe, Blake, Charles	0	10	6
Ashbourne, Bradley, Edwin S.	0	10	6
Aylesbury, Turner, John	0	10	6
Basingstoke, Woodman, George	0	5	0
Berwick, Carr, William Graham	0	10	6
,, Davidson, John	0	10	6
Beverley, Robinson, James M.	0	5	0
Bickley, Garle, John	1	1	0
Bishop's Stortford, Speechly, George	0	10	6
Blackheath, Lavers & Son	1	1	0
Brighton, Schweitzer, Julius	2	2	0
Canterbury, Amos, Daniel	0	10	6
,, Paine, William	0	10	0
Carlisle, Thompson, Andrew	0	5	0
Carnarvon, Jones, John	0	5	0
Cheltenham, Fletcher & Palmer	1	1	0
Chew Magna, Milton, Thomas	0	5	0
Chipping Ongar, Chapman, Richard James	0	10	0
Colchester, Cole, Frederic A.	0	5	0
,, Manthorp, Samuel	0	5	0
,, Prosser, Evan T.	0	5	0
,, Shenstone, James B.	0	5	0
Croydon, Long, Henry	0	10	6
Deptford, Lockyer, George	0	10	6
,, Wickham, William	0	10	6
Diss, Cupiss, Francis	0	10	6
Dumfries, Allan, William	0	10	6
Durham, Burdon, John	0	10	6
,, Rollin, John George	0	10	6
,, Sarsfield, William	0	10	6
,, Scawin & Wortley	0	10	6
Gainsborough, Marshall, John F.	0	10	6
Glastonbury, Mayhew, Thomas	0	10	6
Greenwich, Brown, Alfred J.	0	10	6
,, Tugwell, William Henry	0	10	6
Grimsby, Great, Cook, Robert	0	10	6
Harrogate, Greenwood, Charles	0	5	0
Heckington, Summers, Michael Cole	0	5	0
Hull, Grindell, John	0	10	0
Hulme, Hart, James	0	10	6
Kilmarnock, Borland, John	0	10	6
,, Rankin, William	1	1	0
Kirkby Lonsdale, Harrison, William	0	10	6
Launceston, Eyre, Jonathan S.	0	10	6
Leominster, Davis, David F.	1	1	0
Lewisham, Clift & Crow	1	1	0
Manchester, Brown, William Scott	1	1	0
Market Drayton, King, William George	1	1	0
Merthyr Tydvil, Thomas, Rees	0	5	0
Newport, Monmouth, Cherry, Edwin	0	10	6
,, ,, Gratte, Henry J.	0	5	0
,, ,, Pearman, Henry	0	10	6
,, ,, Phillips, John	0	10	6
,, ,, Young, John	0	10	6
Northallerton, Warrior, William	0	10	6
Norwich, Robinson, James	0	5	0
Petherton, South, Wellington, Frederick G. N.	0	5	0
Pillgwenlly, Newport, Faulkner, Henry	0	2	6
,, ,, Morgan, William	0	5	0
Plymouth, Burdwood, James	0	5	0
Ramsgate, Fisher, Charles & Sons	2	2	0
Runcorn, Whittaker, William	0	10	6
Ryde, Isle of Wight, Pollard, Henry H.	0	10	6
Rye, Smith, Alfred William	0	10	6
St. Austell, Geldard, John	0	5	0
Shepherd's Bush, Bird, Augustus	2	2	0
Sittingbourne, Gordelier, Paul William G.	1	1	0
Sleaford, Heald, Benjamin	0	10	6
Southport, Ashton, William	0	10	6
,, Walker, William H.	0	10	6
Southsea, Rastrick & Son	0	10	6
Spalding, Swift, Francis	0	10	6
Sydenham, Lang, William	1	1	0
,, *Central*, Harris, Daniel R.	0	10	6
Tickhill, Crowther, Thomas	0	10	6
Wellingborough, Thorne, John	0	10	6
Wrexham, Paine, Charles	0	10	6

DONATIONS.

	£.	s.	d.
Broad, John Morris, Hornsey Rise	5	5	0
Hearon, Squire & Francis, 5 Coleman Street	10	10	0

PHARMACEUTICAL MEETING.

Wednesday, March 6th, 1872.

MR. A. F. HASELDEN, F.L.S., PRESIDENT, IN THE CHAIR.

The following Donations to the Library and Museum were announced, and the thanks of the Society were voted to the donors:—

London University Calendar: from the University,—Guy's Hospital Reports, Vol. XVII., 3rd series; St. Thomas's Hospital Reports, Vol. II., new series: from the respective Hospitals,—Specimen of Winter's Bark (*Drimys Winteri*): from Mr. F. J. Hanbury,—Specimen of Chrysophanic Acid: from Messrs. F. J. Hanbury and E. Rammell,—Specimens of Methyl-strychnia, Xylol, and Croton Chloral-hydrate: from Messrs. Hopkin and Williams. Also for exhibition, by Messrs. Hopkin and Williams, Specimens of Syrup of Lactophosphate of Iron, and Syrup of Lactophosphate of Lime,—A very fine Specimen of three Sponges *in situ*: presented by T. H. Hills, Esq.

Professor Bentley called attention to the specimen of chrysophanic acid, presented by Mr. F. J. Hanbury. He thought that such preparations, when brought before the Society by a student, were worthy of notice, especially when the student, as in this case, bore an historic name.

Professor ATTFIELD said that Mr. F. J. Hanbury and Mr. Rammell had, with a great deal of patience and a considerable amount of manipulative skill, prepared this specimen from rhubarb in the Society's laboratory; and perhaps it was not the least interesting part of the matter that they had obtained it from a material that would otherwise be thrown away, namely, from the residue of the preparation of extract of rhubarb. Other students might very well follow in the steps of these gentlemen in utilizing the residues of pharmaceutical preparations for isolating somewhat rare chemicals, and, as they had done, presenting them to the museum.

Mr. WILLIAMS made a few remarks with respect to the specimens of syrup of lacto-phosphate of lime and syrup of lacto-phosphate of iron, which, he said, were made in accordance with the formulæ given in the Year Book published by the Pharmaceutical Conference. The specimens seemed to be very nice and elegant forms of medicine, although he thought they were rather weak, 2 per cent. being prescribed instead of 2 grains in a drachm, which was the common form in the English syrups. He thought they might be very useful. With regard to the croton chloral hydrate, he might say that it was the chloral hydrate of another series; it was the chloral hydrate of crotonic acid, just as the ordinary chloral was the product of acetic acid. It was obtained by passing chlorine through pure aldehyde, and was said to act upon the system perfectly as a narcotic, but not as a stimulant to the heart, and the heart's action was not in any way interfered with. If that were the case, it would be of great importance. It was very soluble in hot water, and but slightly soluble in cold water. In both ether and alcohol it was freely soluble. It was destroyed by strong and boiling sulphuric acid, turning black and evolving hydrochloric acid, in which it differed from ordinary chloral. The dose was about the same as that of ordinary chloral, but not quite so much—not more than 20 grains. Dr. Liebreich, of Berlin, had written upon this subject, and it was entirely upon his authority that he (Mr. Williams) made the statement as to its medicinal qualities.

Xylol had been introduced as a remedy for smallpox. It was the third member of the benzole series; it boiled at 139 Centigrade. It formed a double compound with sulphuric acid, and had many points of interest. The dose was from 5 to 15 drops. The effects following its administration were said to be that the pustules were dried over, and the pitted appearance of smallpox removed.

NOTES ON THE PHARMACY OF IPECACUANHA.

Dr. DYCE DUCKWORTH then read a paper on "Pharmaceutical Preparations of Ipecacuanha."

[This paper is printed at p. 721, and elicited the following discussion:—]

The PRESIDENT said he perfectly well remembered the paper of Mr. Johnson's in 1860, which Dr. Duckworth had spoken of, and also that the subject was discussed by the Chemical Discussion Association of the Society. He believed they came to the conclusion that the acetic preparation was the best that could possibly be obtained, and that the bulk of the precipitate was acid tartrate of potash, but why the matter remained in abeyance and the framers of the Pharmacopœia did not take it up, he could not understand.

Mr. HILLS said that Dr. Duckworth's paper opened rather a new question with respect to wines. The wines of commerce varied so much that he would suggest whether proof-spirit could not be substituted for them, so that they might have something definite as a menstruum. Why the wines of the Pharmacopœia should have remained so long in use, was a subject worthy of consideration for the next Pharmacopœia. It was a question whether they should not do without wines, and substitute alcohol with water in the best proportions for the purpose required. He felt very much indebted to Dr. Duckworth for bringing this subject forward; and he thought that the acetum ipecacuanhæ and the oxymel would recommend themselves to the notice of the profession by whom they would be found very serviceable.

Mr. HANBURY said the course that Mr. Hills suggested had actually been tried, for in the Pharmacopœia of 1824 wines were abolished. Steel wine, antimonial wine, colchicum wine and ipecacuanha wine, made with sherry, were all abolished; but he believed the result was a failure, for in the next edition of the Pharmacopœia the wines were restored.

Mr. WILLIAMS remarked that in making emetia they were very careful not to bruise the root, but used it whole. The preparations before them were made with bruised roots, but he thought bruising the root was rather a disadvantage than otherwise. They sliced it into small pieces, and did not allow that starchy matter that would otherwise come out to get into the preparation. He should like to ask Dr. Attfield how he assayed the samples of ipecacuanha, by what test or means he discovered the various strengths and qualities of these roots.

Professor ATTFIELD said that to the best of his recollection he exhausted the ipecacuanha with alcohol, evaporated to dryness, treated the residue with water and magnesia, evaporated the resulting aqueous solution of the liberated emetia to dryness, and thus obtained a product containing all the emetia, or at all events nothing nitrogenous except emetia, and then estimated the amount of nitrogen in that residue by combustion. Emetia contained nearly $4\frac{1}{2}$ (4·3) per cent. of nitrogen, so that by a simple calculation the proportion of emetia was indicated. He thus obtained results which, in the case of ordinary ipecacuanha, coincided with the results of previous experimenters. In the case of his striated specimen he showed that there could be no more than $2\frac{3}{4}$ per cent. of alkaloid of any kind, even if impure. While speaking, he might perhaps be permitted to give utterance to one or two thoughts that had been suggested to his mind whilst listening to the paper. He understood Dr. Duckworth to say that the precipitate which formed in ipecacuanha wine was not affected by acids or alkalies. Being a mixed substance, containing a body insoluble in acids and soluble in alkalies, and a second soluble in acids and insoluble in most alkalies, that would be the apparent effect; but he presumed alkalies would really dissolve a portion of the precipitate, that was to say, cream of tartar, while acids would dissolve a different portion, neither liquid dissolving the whole sediment.* With that exception he saw nothing in the paper itself to call for remark from a chemical point of view. The feeling which was uppermost in his mind in listening to Dr. Duckworth's paper was one of gratification, namely, that they had had that night what they so seldom had, the pleasure of listening to a paper by a gentleman who was conversant not only with pharmacy and chemistry, but with therapeutics. Most of those who were in the habit of reading papers in that room were looked upon as heretical if they said anything about the action of remedies on the system, yet none knew better than they how intimately associated were pharmacy and therapeutics. He maintained, nevertheless, that they could never have scientific therapeutics, that the art of curing would always remain as now, in great part a mass of empiricism, until researches in therapeutics were as common and numerous as those in chemistry or any other science, such researches being conducted by one or more gentlemen, who either in himself or amongst themselves, had a competent knowledge of chemistry, pharmacy and therapeutics. Some years ago he had the

* See a paper on "Ipecacuanha Wine," read by Mr. George Johnson before the British Pharmaceutical Conference at Birmingham, in 1865. (PHARM. JOURN. 2nd Ser. Vol. VII. p. 179.)—J. A.

pleasure of listening to such papers by Dr. Garrod, Dr. Harley, and more recently by other workers, and those papers did a vast deal directly for the advancement of the philosophical practice of physic, and indirectly for the advancement of what their American brethren called "elegant pharmacy." But, from some cause or other, those who were able to produce such papers as he had indicated, after a time left the good work. He sincerely hoped Dr. Duckworth, however, would continue to make researches in a similar direction to that in which he had so recently been engaged, and give them the benefit of his labours at their evening meetings and in the pages of the Journal, thus benefiting the whole of pharmacy. Another matter that suggested itself in hearing this paper was this, that whereas in ipecacuanha and its preparations they were dealing with substances which varied in quality in respect of a well-defined active principle, they should more frequently use the active principle itself, if capable of isolation in a pure form. He gathered from Dr. Duckworth's paper that in ipecacuanha there was no other active principle than the alkaloid emetia. Now if the active principle of ipecacuanha was emetia, and if emetia could be separated, as Dr. Duckworth told them it could by practical pharmacists, then why not use emetia itself, dissolved in appropriate menstrua, instead of using these different preparations of ipecacuanha. They used ipecacuanha, a material that was admitted to vary to some extent, and they attempted to exhaust it, though not always successfully, by different solvents; they endeavoured to exhaust it by processes which could not be depended on, and produced an article which varied according to the greater or less extent to which it was exposed to the air, and to other influences, and thus ultimately obtained a preparation which necessarily varied in activity. It varied either because the solvent of the active principle went out of solution, and therefore was followed by a deposition of the active principle itself; or because after some time there was a combination of the alkaloid with some constituent of sherry, or other menstruum with formation of a precipitate; or, thirdly, because the natural salt of the alkaloid was carried into solution by soluble bodies, itself not being particularly soluble, and afterwards came out, as many substances were well known to do, when their relations to cohesion readjusted themselves. So that they had a preparation which might vary, because the original substance varied; because the process was not trustworthy, and because when they had produced the article they had any one of two or three changes going on. What reason was there why they should not obtain from ipecacuanha its sole active principle, if emetia were its sole active principle, and employ that as they had already done other alkaloids? He had been told that the different preparations of cinchona bark had been, for many years, gradually going out of use, and that quinine was now chiefly employed. At all events it would be admitted that since quinine had been isolated, cinchona bark, or its products, had been used to an immensely greater extent than before. It was to the advantage of the therapeutist that he should have an active principle, that was always constant in its properties, rather than preparations of that principle, each liable to vary in activity from several causes. It had sometimes been urged against this reasoning that increased expense was involved in isolating these substances, but he did not admit that as a legitimate argument at all; for if pharmacists were true to themselves and one another, the question of cost only affected the public, who were ever ready to pay professional men and tradesmen good fees for good service. Nay, in some trades the leading and successful principle was to employ as much capital and make everything as costly as possible.

Mr. Hanbury thought the discussion was diverting into irrelevant matter. The question asked by Mr. Williams was in what way the emetine in these roots might be estimated. A few years ago a French chemist, M. Lafort, examined the ipecacuanha of Brazil and New Granada, in order to settle which was the stronger. The plan he adopted was to precipitate the emetine by tannic acid, and to corroborate the results by another series of experiments, in which the alkaloid was thrown down by nitrate of potash. In that way he showed that the ipecacuanha of New Granada was somewhat less rich in alkaloid than that of Brazil. He (Mr. Hanbury) thought Prof. Attfield was a little mistaken in saying that ipecacuanha was a variable drug. As imported it was singularly free from adulteration. Now and then a package arrived of what is called *striated ipecacuanha*, or one of the other roots used as ipecacuanha in Brazil; but no druggist was so little experienced or so ignorant that he could be deceived in a sample of ipecacuanha. It possessed characteristics so striking that there was no difficulty in recognizing it, and it never came mixed with other roots.

Professor Attfield said he had been told that evening, by a gentleman who dealt very largely in ipecacuanha, that the powder of ipecacuanha was a most variable preparation, because, somehow or other, the varieties which honourable traders would not buy did get purchased, and came into pharmacy in the form of preparations of ipecacuanha.

Professor Bentley entirely agreed with Mr. Hanbury with regard to the freedom of ipecacuanha root from adulteration. It was quite true that striated ipecacuanha was occasionally imported, but as striated and not as true ipecacuanha, just the same as undulated ipecacuanha, which was, however, rarely seen at the present day. He rose especially to ask a question of Professor Attfield; but before doing so he should like to express his thanks to Dr. Duckworth for the paper with which they had just been favoured. There was a time when they always had at their meetings some leading physicians who took great interest in therapeutics; and they were not only interested in their communications, but they learnt from them that which did not come specially within their province, although it was important they should know something on that head; and this Society, on the other hand, gave them information upon matters in which the physician was not so specially instructed. He trusted that Dr. Duckworth's paper would be followed on many occasions by physicians treating not only upon the preparation of remedies, but enlightening them also as to their physiological and therapeutical actions. Mr. Williams had asked how Professor Attfield obtained emetia. If he (Professor Bentley) recollected Professor Attfield's paper rightly, it was an assay not only of the true ipecacuanha, but also of striated ipecacuanha; and he thought that so far as the percentage of the impure emetia of Pelletier was concerned, the observations of Professor Attfield agreed substantially with those of Pelletier. Thus Professor Attfield found 16 or 17, and Pelletier from 14 to 17 per cent. in the ipecacuanha; and with regard to striated ipecacuanha, Pelletier found about 9 per cent. and Professor Attfield about 10. But in the percentage of pure emetia the experiments of Pelletier and Professor Attfield gave very different results, Pelletier only finding about 1 per cent., whereas, if he remembered rightly, Professor Attfield had found as much as 10 per cent. in true ipecacuanha, and nearly 3 per cent. in striated ipecacuanha. Professor Bentley would like to ask Professor Attfield whether he was satisfied that ipecacuanha yielded so large a percentage of pure emetia.

Professor Attfield explained that in the paper alluded to, he had simply insisted that, at least, the amount of nitrogen in the aqueous extract of the residue of the tincture of ipecacuanha should be estimated before deciding on the value of a sample of ipecacuanha. He had thus shown that the 16 per cent. of emetia obtained by Richard and Barruel, as well as Magendie and Pelletier, must be read as 10 per cent.; and the 9 per cent. in good *Psychotria* as at most 6 per cent. He had, perhaps, erred in speaking of this product as pure emetia; his object at the time was not to isolate the alkaloid, but to eliminate an error in the mode of assaying ipecacuanha. In his opinion the amount of chemically pure alkaloid in ipecacuanha had not yet been ascertained.

Mr. GREENISH said he thought that no doubt could exist in the mind of any pharmacist as to the fact of the vin. ipecac. being a very unsatisfactory preparation; and, also, that in the States they were much in advance of us as regards the pharmacy of this drug; but he should like to ask Dr. Duckworth one question on a point where difficulties would sometimes occur in dispensing these acid preparations. Ipecacuanha wine is frequently prescribed with carb. ammonium, with which the acetic acid would be chemically, if not medicinally, incompatible, how would he propose to meet the difficulty?

Mr. M. CARTEIGHE had read the literature of ipecacuanha, and he knew of no evidence which *conclusively* established that emetia was the true and only active principle of the root, and represented all the activity of the latter. As yet there had not been experiments enough to justify the assumption, and it seemed to him unwise for those who had to prepare medicines to assume a thing not *proved*. With regard to the chemical aspect of the question, he might fairly retort upon Dr. Attfield, that the physicians of the present day believed *more* in the preparations of cinchona bark than they did ten years ago. In science, as in other things, there were fashions; and since the time when chemistry was first extensively applied to materia medica, about thirty years ago, it has been the fashion to believe that every complex substance is resolvable into one or more definite chemical principles, representing the whole of the medicinal character of the original drug. Now, it is well known to most present that this view is not correct as regards the cinchona barks, and it may not be true in the case of ipecacuanha, and therefore they must take the drug as they found it, and treat it with the best solvent they could bring to bear on it. He thought that Dr. Duckworth had exercised a sound discretion in proposing that the *wine* should be retained for a time. It was a domestic remedy largely used by nurses and mothers, and so generally recommended in popular works on medicine, that it would be inexpedient to expunge from the Pharmacopœia a preparation so well known until the public and the medical profession had learned the value of the acetum and oxymel.

Mr. HILLS fancied that the only wine that really failed was the steel wine; he thought the liquor antimonii tartarizati did not look quite so nice as that made with sherry. That, however, did not matter, because it was merely tartar emetic dissolved in the wine.

Dr. DUCKWORTH expressed his great satisfaction that so animated and useful a discussion had been called forth by his paper that evening. This only assured him that there was some ground for his coming before them, which he did with some diffidence, and he hoped that some good might result from their meeting. With regard to the wines in the Pharmacopœia, he took it the use of wine was a relic of old and crude pharmacy. They knew very well that in the Middle Ages, when pharmacy was in its infancy, rectified or proof spirits were not easily to be had, and that the early pharmacists then adopted such wines as were within their reach as menstrua. That these wines, which were mere relics of the past, would be abolished, he did not think was a matter of regret at all, at least so far as regarded ipecacuanha wine. With respect to antimonial wine, that was a preparation which he had held in disfavour for some time. He preferred the Dublin liquor antimonii tartarizati, which was dissolved in proof spirit, and in which there was no sherry at all. This was a very much nicer preparation, and the only difficulty about it was that it was clear and might be mistaken for other things. As to Mr. Williams's hint respecting the manner of treating the ipecacuanha root and preparing it for solution, that simply concerned those who had to deal with these matters, and who ought to know best. He (Dr. Duckworth) thought it was best to bruise the root. It was quite evident that if a solution were attempted to be made, the solvent must have a difficulty in permeating to the innermost recesses, and that the more the root was broken up the more likely they were to obtain the principles contained in the rhizome. With reference to the active principles contained in the rhizome, he believed they were represented in ipecacuanha wine by the emetia. He thought he was justified in stating that the active principle of ipecacuanha was its alkaloid, because the actions of the alkaloid were precisely the same as those of ipecacuanha. He had made experiments upon different animals, and had used emetia clinically, and the result was precisely the same as when ipecacuanha was given in equivalent doses. He believed that emetia had only been used by himself and a colleague of his in Bombay, who wrote home for some of the alkaloid, and was supplied with an ounce of it. Ipecacuanha was largely used in dysentery; and as we saw little of acute dysentery in this country, it being almost unknown, except sometimes in the districts of Rotherhithe and Wapping, they had little opportunity of using the emetia in large doses. But in India it was different. One of his colleagues there, a surgeon to one of the large railway companies, wrote to him for some of this emetia, which he wished to compare with ipecacuanha, and he used this drug largely for eighteen months both upon Europeans and natives; and the result of these researches was that he found emetia to be most valuable—not more so perhaps than ipecacuanha; but still it was given in a simple form and in small bulk, and therefore commended itself. It was found to exercise all the therapeutical virtues of ipecacuanha in that terrible disease. That was the first instance that he knew of in which emetia had been used therapeutically; and so far with success. With reference to the remark Professor Attfield made as to whether they might not employ solution of emetia, he might say that the doses they employed averaged from one-twelfth to one-sixth of a grain, sometimes given alone, and sometimes in combination with morphia. The only objection which occurred to him as to the use of emetia in that form was that it was exceedingly costly, and also a powerful drug, requiring to be used with the same care as strychnine and more powerful agents of that kind. He had found that emetia could be dissolved in sherry, and that one or two minims of the solution he made was sufficient to produce nausea, and it was a matter of consideration with him whether there might not be an acid solution of emetia which should be so diluted as to represent the strength of the ordinary ipecacuanha wine which they now used. Then, as to whether alkaloids generally represented the active principles of drugs, he thought the answer must be that they did not. If they took cinchona barks for example, there was no doubt that quinine was not the only active principle to be found in them, and so with other roots and preparations which yielded active principles and alkaloids. There was no doubt that though these bodies were useful in medicine, yet in many cases the preparation of the whole drug was found to work better and more satisfactorily than when a single alkaloid was employed. Therefore they could not do without these two preparations of ipecacuanha. Mr. Greenish had put a very pertinent question. Sometimes they saw prescriptions in which there was a combination of ipecacuanha wine with carbonate of ammonia or with alkalies, and there could be no doubt that these were non-chemical preparations. The emetia must be thrown out of solution, and no matter how often a practitioner prescribed that combination, it was not a chemical preparation. He believed that it was also the case with other prescriptions; for instance, he did not think they could successfully treat certain diseases of the bladder without a combination of henbane and alkali, which was found to work well, although Dr. Garrod had shown it to be non-chemical; but as the great aim of the physician was to relieve his patient, he was content to leave the pharmacist to fight the question out with the chemist.

A "Note on *Cinchona caloptera*," by Dr. J. E. De Vry, was then read, which is printed at p. 723.

The President announced that the next meeting would be held on the 3rd of April, when Mr. C. H. Wood would read a paper "On the Weights and Measures used in Pharmacy."

Provincial Transactions.

HULL CHEMISTS' ASSOCIATION.

At a meeting of the above Association, held on Monday, February 19th, 1872, the President read a letter he had received from Mr. W. V. Radley, President of the Sheffield Pharmaceutical and Chemical Association, on the subject of Provincial Pharmaceutical Education. After some discussion, during which Messrs. Pickering and Baynes gave a most lucid explanation of their views on the points raised by the letter, on the motion of Mr. Baynes, seconded by Mr. Pickering, the letter was ordered to be entered on the minutes.

The following resolution, moved by the President, seconded by Mr. Baynes, was carried, and the Secretary ordered to forward a copy of the same to Mr. Radley:—

"At a General Meeting of the Hull Chemists' Association, held on Monday evening, February 19th, Mr. Atkinson Pickering (President) in the chair, the subject of Provincial Pharmaceutical Education was discussed with much animation. The possibility of the Pharmaceutical Society ultimately ceasing to be an educating body was alluded to. The apparent want of sympathy on the part of the Council with, and the indisposition to afford material aid to, local associations were also strongly dwelt upon by several gentlemen. It was urged that so long as the Society remains an educating body, justice and policy alike require that a reasonable proportion of its large income should be applied to the promotion of education in the provinces, from whence its chief support is derived; and that this could be best effected by grants of money to local societies, who, in the opinion of the Council, were doing their work efficiently. And it was contended that it was unfair, and looked distrustful, to restrict grants to the purchase of books and apparatus, whilst immense sums of money had been expended by the parent Society in payment of lecturers, professors, rent, and general expenses, a very large percentage of which had been ungrudgingly contributed by country members, who, now that necessity had arisen, felt that they had a perfectly legitimate claim on the funds of the Society to meet similar payments in the provinces. It was admitted that the acceptance of such grants would give the Council a right to inquire as to the quality and character of the instruction given, which in itself would be an advantage, and tend to keep the classes up to the mark. The general opinion of the meeting seemed to be that without some such aid, for a few years at least, local associations would languish, if not actually die out, and a resolution was unanimously agreed to requesting the Committee of the Association to take such steps as they might deem necessary to carry out the views of the meeting."

The following letter from the President was forwarded with a copy of the resolution:—

Copy.

"45, *Lowgate, Hull*,
"*February* 24*th*, 1872.

"Dear Sir,—I quite agree with you in all the principles contained in your letter addressed to me on the 16th of this month, on the subject of Pharmaceutical (Provincial) Education. I have, for some time past, been much dissatisfied with the indifference manifested by the Council of the Pharmaceutical Society on the subject.

"The Society has now been established many years, and has been sustained and supported to a large extent by its country members. Almost the whole of the income of the Society has been expended for the benefit of the Institution in London, an institution which the country members are quite as proud of as their town brethren. At the same time they cannot shut their eyes to the fact, that the institution is but of little use to the country apprentices and assistants as an educating institution.

"Every member of the trade must now pass Examinations before commencing business. The trade is now in a very different position from what it was some years ago. It now becomes a serious question how the rising generation of country pharmaceutists are to be educated for their profession, so as to be able to pass the Minor examination when they are out of their apprenticeship. This can only be done successfully by the establishment of provincial schools of pharmacy. How are these schools to be supported and maintained in efficiency? In my opinion by subscriptions of the local members, by fees from the students, and by grants from the parent Society.

"The Society now possesses a large sum of money invested in the Funds, the dividends from which produce a considerable income; I do not see the necessity of increasing these investments. When the dividends are added to the annual subscriptions of the members, it places in the hands of the Council a large income for the advancement of pharmaceutical education. Of this large sum the country members are entitled, not as a favour, but as a right, to their fair proportion for that object. Unless this be granted to them, it will then become a serious question, whether the Pharmaceutical Society shall not cease altogether to be an educating, and remain only an examining body. In a matter of so much importance I felt it my duty to lay your letter before the members of the Hull Chemists' Association, and have pleasure in forwarding you a copy of a resolution on the subject. Our Society will be prepared to assist in carrying out the views expressed in the resolution. Circumstances have prevented me from replying to your letter before.

"I am, Sir, yours respectfully,
"Atkinson Pickering,
"*President of the Hull Chemists' Association.*"

SUNDERLAND CHEMISTS' ASSOCIATION.

At a meeting of the above Society, held February 28th (H. Thompson, Esq., Vice-President, in the chair), the following resolutions were passed:—

Proposed by J. Harrison, seconded by D. B. Sharpe, "That this meeting is of opinion that the decision of the Council of the Pharmaceutical Society, not to grant pecuniary assistance to local schools, will have a tendency to cripple the efforts of these societies. It is also of opinion that it is desirable to establish Branch Associations in various districts of the country in connection with the Parent Society in London, and that arrangements should be made by which periodical examinations could be held at such branch schools."

Proposed by R. Robinson, seconded by T. Nasbet, "This Society approves of the proposition that a meeting of delegates from the Northern and Midland Counties should be held at Manchester or Leeds, or other central town, to discuss the necessary steps to be taken in furtherance of these objects."

NORWICH CHEMISTS' ASSISTANTS' ASSOCIATION.

A Lecture on "Nitrogen" was given at the rooms of the above Association on Thursday, February 29th, by Mr. F. Sutton, Mr. A. J. Caley occupying the chair.

The lecturer, after considering and illustrating the negative properties of nitrogen in a free state, proceeded to contrast with these its great activity when combined, and showed its value in the construction of the type formulæ of organic compounds. He concluded a most interesting lecture with an exhortation to his hearers to follow up the study of organic chemistry.

At the close of the lecture votes of thanks were carried for the lecturer and chairman.

There was a good attendance.

Proceedings of Scientific Societies.

SOCIETY OF ARTS.

The Study of Economic Botany, and its Claims Educationally and Commercially Considered.*

BY JAMES COLLINS, F.B.S. EDIN.

Curator of the Pharmaceutical Society's Museum.

(*Concluded from page* 715.)

Now, it can be easily seen from this, that such collection of forest products is precarious and objectionable in several ways. First, with regard to the collectors themselves. It is, as a rule, only when other means of employment are wanting that they take to that of collecting, and, even on moral grounds alone, such a life is anything but humanizing. Frequently, too, such operations are interrupted by the caprice of some petty ruler, who requires their services in warfare. This is the case everywhere. Then often, from causes other than natural, the trees yielding the wished-for product are so far apart as to necessitate a vast extent of ground to be gone over before any quantity can be collected, which greatly adds to the cost, and in many cases precludes the possibility of collection at all. The transport, too, is difficult, confined very often to human or animal porterage, which will not allow of bulky articles being collected. Many valuable woods labour under this disadvantage, and unless they are on the margin of navigable rivers, and can be thus floated down, they are lost to man's use. Now, the great object of cultivation and acclimatization is to centralize and concentrate in a manageable space. The modes of collection adopted afford many reasons why, in the case of all necessary products, cultivation and conservancy should be resorted to. The native modes of collection are, to say the least, very destructive, and entail a great loss of material; for often, were cheap means of transit available, other parts now wasted could be utilized. We may allude to four common operations employed in the collection of vegetable substances, viz. (1) the collection of those parts of a plant, such as flowers, fruits and seeds, which do not necessarily entail the loss of a life to the plant; (2) the incision or tapping of the tree for the collection of gummy and milky juices; (3) barking the tree; and (4) a mode which involves the total destruction of the tree. The collection of the fruits and seeds of trees does not necessitate the destruction of the tree, but it is quite a common custom with natives to destroy the tree to save themselves trouble. Tapping or incising the bark is resorted to in order to obtain milky juices and gums, such as gamboge, india-rubber, gutta-percha, maple sugar and the like. The sugar-maple is generally tapped with a three-inch bit to a depth of one and a half to two inches. Tapping does not check the growth of the maple, though it injures its wood, and renders it lighter and less dense. The general yield of juice is twenty gallons in the season of thirty days. Tapping, when done judiciously, does not injure the vitality of a tree, but there are two great dangers in this operation, namely, over-tapping, or bleeding the tree to death; and even after judicious tapping, not allowing a sufficient length of time to elapse before the operation is repeated. Natives always resort to overtapping, and frequently even cut down the tree for the sake of obtaining a larger yield. In many cases they are sure not to visit the same spot again, and, therefore, they bleed the tree as long as they can. This impoverishes the tree, and predisposes it to succumb to atmospheric changes and to the attacks of insects, for healthy trees are not nearly so liable to these latter destructive agents, and very seldom does a tree long survive the united influences. Barking, too, in some cases, if carefully performed, does not injure the tree; the cork-tree, it is well known, improves under the treatment. Mr. M'Ivor has adopted this method of barking cinchona trees, and it is found that it does not injure the tree in the least. He thus describes his *modus operandi*:—

"In removing the strip of bark, two parallel cuts should be made down the stem, at the distance apart of the intended width of the strip of bark; this done, the bark is raised from the sides of the cut, and drawn off, beginning from the bottom, care being taken not to press or injure the sappy matter (*cambium*) left upon the stem of the tree. This *cambium*, or sappy matter, immediately granulates on the removal of the bark, and being covered (with moss), forms a new bark, which maintains the circulation undisturbed."

The renewed bark is nearly as thick in one year's growth as ordinary bark is in three years, and is, moreover, very much richer in quinine. Mr. M'Ivor's method, I am afraid, is, however, much too delicate an operation to be successfully performed by any but skilled persons.

The total destruction, except in the case of herbaceous and quickly-growing plants, or where the trunk or other vital part of the tree is required for use, is totally uncalled for, and even where necessary, the future supply should always be guaranteed by re-planting. This total destruction is the more highly reprehensible in the cases of trees yielding useful juices, such as india-rubber and gutta-percha, with which the subject is more intimately connected. The reason assigned is that the yield by simple incision or tapping would not be remunerative; but this is not the case. The actual reason is the existence, to a greater or less extent, of a presumed or real right of common proprietorship, and the absence of government oversight in the forests where this mode of collection is practised. Self-denial and forbearance from monopolizing any sources of supply are virtues not looked for in the most civilized countries, much less amongst untutored savages.

A collector reasons thus, if he reasons at all on the subject: "If I do not take all I can get, some one else will, and why should I leave that which will enrich a less scrupulous collector?" Even in India, where the necessity of forest conservancy is fully recognized and carried out, the notion of the inhabitants of a right of common proprietorship is a source of constant trouble to the Department, and the enforcement of a parental conservancy against individual devastation is looked upon by some of the inhabitants as a great injustice. Even where the right is recognized, and licences are taken out under a full understanding of this fact, constant damage is done by excesses. In an able report on the caoutchouc forests of Assam, Mr. Gustav Mann says—

"The privilege was sold (in the Durrung district) for 1012 rupees to kyahs, in the Mungledye Bazaar, who purchased 2500 maunds, but had not the slightest control over the tapping of the trees by those to whom they sub-let their right, and encouraged the latter as much

* Read on Wednesday Evening, Feb. 14.

as was in their power to obtain the largest possible quantity during the short time they held the monopoly of buying it, as consistent with their interest, without any regard, however, for future supplies, which was of most disastrous consequence, in as far as it induced the men who tapped and collected the rubber to indulge in the most outrageous wholesale destruction of these valuable trees, by either felling them with axes, or, if this was too troublesome, to collect firewood and burn them down, so as to render the operation of tapping more convenient than it would have been had the trees been left standing; and several hundred magnificent trees were counted, in all directions, lying on the ground with cuts across their trunks and roots from 6 to 18 inches long, 3 inches broad, and a foot to 18 inches apart, and smaller cuts on the upper branches of them, by which all that they could yield was extracted immediately after they were felled, with an utter disregard for future wants. So that at present there is absolutely no rubber worth speaking of to be got from these forests, nor for centuries to come, unless the tree is replanted."

It, therefore, cannot be too deeply impressed on all interested in the subject, that every useful vegetable product for the supply of which we depend on spontaneous production, and also those which could supplement these supplies, should be, by cultivation and acclimatization, brought under conditions where the various desiderata, such as the improvement of quality, quantity, purity, an easy collection, with as little loss of material as possible, unfailing supply, and a cheap transit to the seats of consumption, could be attained, thus lowering the price, and increasing the utilization. The Indian Government have wisely directed their best energies to this subject of acclimatization, and in no instance have the results been more manifest than in the successful cultivation of the cinchonas.

The first cinchona plants arrived in India from South America under the superintendence of Mr. C. R. Markham, in 1861. The last report from one plantation, that in Bengal, gives the following numbers:—*Cinchona succirubra*, 1,233,715; *C. officinalis*, 440,000; *C. calisaya*, 33,000. And to show, rather in illustration than in proof, that the plants do not deteriorate but improve, I will quote a single case.

In 1859, Mr. Howard received from South America bark and seeds of *C. officinalis*. The bark yielded by analysis 3·11 of alkaloids. The seeds were sown, and an English grown plant yielded 1·93. One of these growing plants was sent to India, and this plant, partly grown in England and partly grown in India, yielded 2·36, whilst a third generation, descended from the latter plant, yielded 3·33, thus showing a percentage of the Indian grown plant of 0·22 over that of the South American parent. In fact, a variety of *C. officinalis* grown in India yielded 11·40 per cent. of alkaloids, and of this 9·75 per cent. was quinine.

As to the advancement of our knowledge of economic botany, I should like to say a few words. At the present time we have no society which deals specially with this subject. At one or two of our existing societies papers are occasionally read on vegetable products, but what is really wanted is a society, or section of an existing society, which would give its attention systematically to this very important branch of the science of botany. I trust I am not too sanguine in anticipating that such a body would meet with warm support from our merchants and manufacturers. Any remarks, however, I may here venture to make on the work of such a society will not be out of place, as they will be equally applicable to individual effort.

One of the surest means of progress towards accurate knowledge is the collection of well-authenticated specimens of vegetable products, specimens which, being obtained by personal collection or other equally reliable source, and accompanied by leaves, flowers, and fruit obtained from the same identical tree, could be accepted as of critical value. It is very necessary that herbarium specimens should be collected from the same identical tree. Some trees may be so very similar in general appearance as to be considered identical by an inexperienced person, yet, when examined by one skilled in such things, may be found to be totally dissimilar in properties and structure. And when the name of the tree yielding a useful product is known, it allows of the product being searched for elsewhere. Too much reliance, it is feared, has been placed in the presumed good faith of "intelligent natives." It is said that the practice is not uncommon with them, when instructed to go to a particular spot at some distance, and procure a certain specimen, that, having arrived at a safe distance from their starting-point, they calculate the time it would occupy to go to and return from the place indicated, they take their rest under some shady tree, and when the time has expired, collect a specimen from a neighbouring tree, and return with it as the result.

Even where a traveller collects his own specimens, he has to be constantly on his guard, as the natives frequently use every artifice to mislead him. However good a specimen may otherwise be, if its history and its source are unknown, it is almost valueless for purposes of scientific study. Also much good can be done by endeavouring to clear up the many doubtful points with regard to the history of many of even our commonest products. Dr. Lindley, in the preface to his 'Flora Medica,' says, "All are aware how conflicting are the statements found in books and made in conversation respecting the sources from which medicinal substances, often of the commonest kind, are derived." These remarks, penned in 1838, are, to a great extent, equally true now. The Admiralty have done good service to science by publishing a 'Manual of Scientific Inquiry,' a new edition of which has recently appeared. One of the sections is devoted to economic botany and the various points requiring elucidation. But this could be done to a much greater extent, and with consequently greater results, by a society, in sending out instructions and inquiries to consuls, traders and other residents abroad.

Recent and also old collections made by travellers should be examined and compared with published or other accounts. It has been found more than once that where one substance has failed from any cause, a new one has been substituted, and had the original name appended to it. To take an illustration of the good which may accrue from these researches, let me refer to an incident in the cinchona history. From the years 1852 to 1856, Mr. Howard was working on the Peruvian barks, and examining all the materials of the Spanish botanists, Ruiz and Pavon, with which he was acquainted, but the results did not fully satisfy him, and, to quote his own words:—"I could not help surmising that there must remain at Madrid further results of the labours of the Spanish botanists which might throw light on the many questions still left in obscurity. I consequently caused inquiry to be made, and in the year 1858, obtained by purchase 54 specimens of barks, of Pavon's collection, together with an original manuscript in Pavon's handwriting, which appears to have been commenced about the year 1821, and finished in 1826. This was sold before Pavon's death to a botanist in Madrid, from whom it passed into my hands." This manuscript Mr. Howard published in a magnificent volume, under the title of 'Illustrations of the Neuva Quinologia of Pavon.'*

Mr. Markham also found the specimens and drawings of Ruiz, Pavon and Mutis, illustrating the same question, "buried" in a cupboard in a tool-house at the Botanical Gardens at Madrid. And if this be the case, may we not hope that other valuable materials may be brought to light if sought for? The question must occur

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* The original MSS. of Pavon was exhibited at the meeting, having been kindly lent by Mr. J. E. Howard. It is written on poor-house paper (*sello de pobres*)!

to every thoughtful reader of narratives of exploring expeditions, "What becomes of the materials resulting from these expeditions in cases where they are not published?"

The literature of economic botany labours under the disadvantage of other scientific subjects, of being "scattered," and even to a greater extent than most, and efforts should be made to remedy this evil. Some of the old works on the subject are even now of sufficient value to deserve reprinting.

I must now draw my remarks to a close. I have endeavoured to bring before you a few of the salient points of a subject of great interest to us all. There are many points which would admit of treatment at greater length, but time will not allow. The subject itself, irrespective of its many practical claims, is of an interesting and fascinating nature, in its various botanical, commercial and ethnological bearings. For teaching in schools, it is at once useful in its relations to every-day life, inculcating habits of accuracy, observation and perseverance in the pursuit of truth; and in closing these remarks, I would add, for the consideration of all intending students of the subject, this motto:—

"Without questioning, no investigation;
Without investigation, no truth;
Without truth, no science."

For science is but truth ascertained by the many, classified for the benefit of the individual, and science, truly so called, must be isomeric with truth.

SOCIÉTÉ DE PHARMACIE DE PARIS.

At the sitting of this Society on Monday, January 8th, M. Lefort vacated the presidential chair in favour of M. Stanislas Martin.

M. Baudrimont described some researches which had for their object the obtaining a sulphochloroform. He said that chloroform reacts upon sulphide of sodium; but the reaction is complex, and does not yield satisfactory results. He, therefore, added to this sulphide a solution of chloral in alcohol and water. The reaction that followed at ordinary temperatures was remarkable: the liquid became warm and assumed a magnificent red colour. With an aqueous solution the liquid became turbid and gave an abundant yellow precipitate. Similar results followed the use of an alcoholic solution, which gave rise to so intense a colouration, that the presence of chloral to the extent of 1 part in 400 might be detected by this method. M. Baudrimont purposes further to investigate this reaction.

M. Marais having observed that certain very fugitive colouring-matters could be fixed in silken and woollen fabrics, M. Baudrimont said that such might be the case with this one, for it reddened the hands and paper, and the colouration was pretty persistent. The colour, however, undergoes change, even in the dark.

Parliamentary and Law Proceedings.

HOUSE OF COMMONS.

Adulteration of Food and Drugs Bill.

Wednesday, March 6th.

Mr. Muntz, in moving the second reading of this Bill, was pleased to be able to observe that the subject had excited much greater interest than it did formerly, and that people had begun to recognize the fact that it did not propose to interfere with the nefarious practices of trade, but to put a stop to the adulteration of food by the mixture of articles poisonous or injurious to health. If any one chose to mix beans with coffee or water with milk, no one under this Act could say anything; but if any baker adulterated his bread with brick-dust, poison of any sort, or with plaster of Paris, the clauses of this Bill would render him liable to severe punishment. In New Zealand they had recently visited such offences with imprisonment without the option of a fine. He was glad, however, to perceive that some of the clauses of this Bill had been incorporated in the Public Health Bill, and the further progress of this measure would, therefore, be rendered unnecessary, provided that Bill were passed. He would now ask the House to allow the Bill to be read *pro formâ* a second time, on the understanding that at the proper time, if the Government Bill was passed, the order for the third reading would be discharged.

Lord E. Cecil believed that his hon. friend deserved the greatest credit for his exertions in this matter, and was glad that since he had first introduced the subject, some three years since, it had gained such ground as to be recognized in the Public Health Bill. The Bill which his hon. friend had introduced was, in his opinion, not perfect, because it was too permissive in its character, and not sufficiently stringent. He was glad that a measure dealing as this one must with the interests of the poorer inhabitants of our larger towns would be brought in by the Government, and he should be prepared, in conjunction with his hon. friend, to move at the proper time any clauses which it might be thought necessary to introduce.

Sir D. Corrigan objected to the immunity which the hon. member suggested should attend such processes as the mixing of water with milk. Adulteration meant either adding to or subtracting from an article, and that should be borne in mind when a definition of the word came to be given.

After a few words from Mr. Locke,

Mr. Stansfeld expressed his readiness to take into careful consideration any suggestions which might be made for the amendment of the Government proposals on the subject, while he hoped the paper might not be encumbered with a mass of amendments so as to endanger the passing of the Bill this session.

The Bill was then read a second time, and committed for Wednesday, 1st May.

The second reading of the Public Health and Local Government Bills, fixed for the 7th inst., was deferred till Thursday, 14th March.

Thursday, 7th March.—Mr. Muntz gave notice of a motion, in committee on Public Health Bill, to include the penalty imposed by the 24th section of the Pharmacy Act, 1868.

Friday, 8th March.—On going into committee of supply, Lord E. Cecil was to call attention to the position in which the question of the adulteration of food, etc., now stands.

Poisoning by Arsenic in a Pudding.

Fifteen persons were poisoned a few days since by arsenic present in a rice pudding, which had been provided among other refreshments at a funeral at Saxby, in Lincolnshire. While on the road to the cemetery those who had partaken of it were seized with the symptoms of arsenical poisoning. Medical aid was at once obtained, and all the sufferers eventually recovered. It appeared that the deceased had kept some white arsenic in a tin, and that this was substituted for ground rice in making the pudding which was eaten on the day of the funeral.

The Rev. Charles W. Markham, Rector of Saxby, Barton-upon-Humber, in a letter to the editor of the *Times*, in reference to this case, says:—

"We have no possible evidence to show how this tin of arsenic, which was used in the baking-powder of which the pudding was made, came into the house. Two old people, seventy-eight and eighty, had occupied the house for many years, and the survivor of them was not aware that either of them had a tin containing ½ lb.

of pure white arsenic. The registers of the sale of poison in all the chemists' shops within ten miles of this place have been searched (including the town of Hull), and no entry has been discovered of the sale of arsenic to any one connected with the family in question.

"My object in addressing you is to point out how inefficient the present regulations for the sale of arsenic are to protect the lives of the public unless there is some official supervision to see that they are carried out. If the precautions in the Act, 14 and 15 Victoria, cap. 13, were strictly observed by all chemists and druggists, no person could obtain so small a quantity of pure arsenic as ½ lb. He would be obliged to have it adulterated with soot or indigo, and then there would not be any probability of such an alarming accident occurring as fifteen persons being brought to the verge of death by using arsenic in mistake for ground rice. Had these persons died, we should have had many suggestions for some police supervision of the sale of poisons. I hope some may be forthcoming now, and may attract the attention of some one in authority.

"I may add, that in my capacity as a magistrate I have thoroughly investigated the circumstances with the police, and there can be doubt that the poisoning was accidental; that is to say, there is not the slightest ground for suspecting any guilty purpose."

The Suicide by a "Vermin Killer."

At an adjourned inquest at Oldham, on the body of Elizabeth Barrow, who committed suicide by taking some of Steiner's vermin paste containing phosphorus, as reported on p. 718, the coroner intimated that he had been in correspondence with the Secretary of the Pharmaceutical Society in reference to his remarks on this case, and it appeared that he had been in error in what he said as to phosphorus being included in the poison schedule of the Pharmacy Act. He therefore took the earliest opportunity of correcting this mistake, into which he had been led by the list produced by the witness Harrison.

MEETINGS FOR THE ENSUING WEEK.

Monday.........*Medical Society*, at 8 P.M.
March 11. *London Institution*, at 4 P.M.—"Elementary Music." By Professor J. Ella.

Tuesday ......*Royal Medical and Chirurgical Society*, at
March 12. 8.30 P.M.
Royal Institution, at 3 P.M.—"On the Nervous and Circulating Systems." By Dr. Rutherford.

Wednesday...*Society of Arts*, at 8 P.M.—"The British
March 13. Trade with France during the last Ten Years." By Professor Leone Levi.
London Institution, at 7 P.M.—Conversazione: "Gleanings in Syria and Palestine." By Captain R. F. Burton.

Thursday......*Royal Society*, at 8.30 P.M.
March 14. *Royal Institution*, at 3 P.M.—"The Chemistry of Alkalies and Alkali Manufacture." By Professor Odling.

Friday ....*Royal Institution*, at 9 P.M.—"The Alphabet
March 15. and its Origin." By Mr. J. Evans.

The following journals have been received:—The 'British Medical Journal,' Mar. 2; the 'Medical Times and Gazette,' Mar. 2; the 'Lancet,' Mar. 2; the 'Medical Press and Circular,' Mar. 6; 'Nature,' Mar. 2; the 'Chemical News,' Mar. 2; 'English Mechanic,' Mar. 1; 'Gardeners' Chronicle,' Mar. 2; the 'Grocer,' Mar. 2; the 'Journal of the Society of Arts,' Mar. 2; the 'Canadian Pharmaceutical Journal' for February; the 'Journal of Applied Science' for March; the 'New York Medical Record,' Feb. 15; Longmans and Co.'s 'Notes on Books' for Feb. 29; the 'Florist and Pomologist' for March; the 'Doctor' for March; the 'Journal of the London Institution' for March; 'Food, Water and Air' for March; 'Journal de Pharmacie et de Chimie' for February.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Pharmaceutical Examinations.

Sir,—Allow me to draw the attention of the readers of your Journal to the report of the examinations held respectively in England and Wales and Scotland, as published in the issue of February 10th.

The percentages of rejections are as follows:—

	England and Wales.	*Scotland.*
Major	29·8	0
Minor	37·0	36·17
Preliminary	35·0	16·12
Modified	36·8	25·90

Or, taking the average of all four in each,—

34·6 . . . 19·54

We are, therefore, either most lamentably inferior to our northern friends in point of intellect, or there must be some little difference between the stringency of the examinations as conducted by the two boards. If I am wrong in assuming the latter to be the case, I shall feel much obliged to any gentleman who will correct me; but if right, this is surely a matter deserving the immediate attention of the Council.

London, February 29th. Edward H. Storey.

[*** The great disparity in the numbers of candidates who came before the two boards during the year may be considered as a fair reason for not comparing the percentages of rejections. Supposing one more candidate had presented himself for the Major in Scotland, and that that one had failed, the percentage of rejections would have been 25, that is, nearly equal to the English failures.—Ed. Pharm. Journ.]

Dr. Bose (Furreedpore) is thanked for a communication respecting indrajab which he has forwarded, but it is unsuited for publication in this Journal.

M. P. S.—Apply to Messrs. Barr and Sugden, Covent Garden, stating the purpose for which the seeds are required.

W. Groodrick.—We are unable to supply you with the information asked for. Probably you have mistaken the question.

"Hora Somni."—The preparations you refer to are virtually the same and of the same strength.

"Inquirer."—The following formula for iodide of quinine is from Beasley's 'Pocket Formulary:'—Add, by drops, a solution of 24 parts of iodide of potassium in 8 of water to a strong solution of 20 parts of bisulphate of quinine. Wash the precipitate quickly and dry it in the shade."

J. K.—The address you ask for is 43, University Street, London, W.C.

"A New Apprentice."—The information shall be forwarded to you through the post, upon forwarding your address to 17, Bloomsbury Square, London.

"Apprentice."—We cannot comply with your request by prescribing for the cure of worms, otherwise than by recommending you to consult a medical man.

G. W. Stephens.—The restrictions of the Pharmacy Act apply only to the sale of the articles specified in the schedule appended to it; neither of the articles mentioned by you are included therein.

"A Country Chemist."—The law requires that the sale of "every compound containing any poison within the meaning of the 'Pharmacy Act, 1868,' when prepared or sold for the destruction of vermin" shall be subject to the regulations applying to the first part of Schedule A. of that Act.

Communications, Letters, etc., have been received from Messrs. M'Masters, Hodgson and Co.; Messrs. Domeier and Co., Mr. R. C. Tichborne, Mr. W. L. Scott, Mr. R. M. Atkinson, Mr. H. Pocklington.

PHARMACY IN THE LABORATORY.

BY A. F. HASELDEN, F.L.S.

Many months ago I drew the sketch, or draft, of a paper tending to inquire how far the manufacture of the Pharmacopœia preparations could be carried out in ordinary establishments, but put it aside until reminded of it by the following sentence in Mr. Greenish's excellent paper upon pharmacy in North Germany:—"Until within the last ten years every pharmacist was bound to make the preparations of the Pharmacopœia in his own laboratory; since that time they are at liberty to purchase." In England the pharmaceutist has never been compelled, at least in our time, to make the Pharmacopœia preparations in his own laboratory. And yet practical pharmacy in the laboratory, independently of the dispensing counter, abounds in matter of interest; the operations are numerous and various, the processes in many instances easy of performance, admitting sometimes of alteration attended with improvement, for as old teachers pass away, new ones take their places, and naturally endeavour to satisfy the prevailing thirst for something new, and with varying success. Under the conviction that all admit, if not the necessity, at least the advantage of performing a certain amount of practical laboratory work in studying pharmacy, I propose running quickly through those preparations which it is quite possible to make in an establishment of any pretension. I am further induced to consider this matter from facts which have come to my knowledge, showing that in many establishments, practical manufacturing pharmacy is little or not at all carried out; nearly every preparation is bought: roots, barks, etc. for tinctures are purchased in a state ready for maceration or percolation, and even the tinctures themselves are purchased. Is it marvellous, under these circumstances, that roots, barks, fruits, gum-resins, etc. etc. in the unbruised or unpowdered state are not readily recognized by candidates for examination? I am anxious to alter this, and induce all pharmaceutists to prepare as much as possible at home; apprentices would then be better informed, there would be more real workers, and the natural supposition follows, that pharmacy would be a gainer.

For the manufacture or production of most of the preparations used in pharmacy, some description of workshop or laboratory is indispensable, and such work requires more or less personal attention on the part of the operator. When so engaged, the shop and dispensing-counter cannot at the same time be efficiently attended to by the same person; therefore, when I speak of things as desirable, where possible, I do not mean that they are indispensable. In the centre of London and other large towns, rent would prove a difficulty in the way of a laboratory attached to or in communication with the other part of the premises, but for want of a better, a back kitchen on the basement may be made available. In the outskirts, however, or in the country, a suitable building may be arranged without much difficulty or outlay. Where there's a will there's a way. While I write, I feel that there will be the will; it is growing with those who are now being trained for the future practice of pharmacy; students will not be satisfied with buying and selling without making and knowing more about the preparations than they have been in the habit of doing; besides, the knowledge acquired by making is a knowledge not readily forgotten. Commercially, it pays to make many preparations, strictly pharmaceutical, and yet these are frequently bought.

To return to our subject. Amongst those things which for many reasons it would seem desirable, but which might not be always convenient, to make, I may mention the simplest of the Pharmacopœia, the waters. And here, at the very threshold, difficulty apparently stares one in the face; nevertheless, it is a difficulty which is not insurmountable. All the waters, not excepting even those which it is admitted can be as well prepared by a simpler process, are directed to be prepared by distillation. For this, a still is absolutely necessary; it need not, however, be very large, say 20 gallons, for which, with the condenser and a fair supply of water, room is required. The idea of utilizing the kitchen-boiler, mentioned by Mr. Staples, has been known for many years, as stated by Mr. Bottle and others, although not carried out as advised by Mr. Staples. Distilled water by such an arrangement, and some others which could be mentioned, may be obtained in sufficient quantity and purity for all ordinary requirements. These are not few in number or importance—to wit, infusions, decoctions, tinctures, liquid and solid extracts, mixtures, etc. Did the Pharmacopœia not direct the employment of distilled water, practical men are aware of the advantages in most, and the necessity in some, cases for its use. In dispensing, much discomfiture would occasionally result from the use of water not distilled, although water that has been boiled and left to become cold, and sometimes rain water filtered, have been substituted without much disadvantage, when distilled water could be obtained only at great inconvenience or charge for carriage. The adaptation of the kitchen-boiler would not answer for the flavoured waters, as they would render it useless for all ordinary purposes,—to say nothing of the inconvenient necessity of cleaning it from a previous odour. I may here mention that as far as my experience goes, the most effectual way of cleaning or driving out the flavour of a previous distillate from the worm is by passing steam through it from the still for twenty minutes, having run off the water from the worm-tube or condenser. All the waters of the Pharmacopœia, with two exceptions, are directed to be prepared by distillation from the flowers, fruits, leaves, or bark, as the case may be. That the waters distilled from the fruits, etc. are superior to those triturated with the essential oils, is not a matter to be questioned; it has been admitted, as set forth frequently by others as well as myself. If it were possible to make cinnamon water as good from the oil as from the bark, there would be always a possibility of adulteration. It is well known that the oil of cinnamon leaves has been constantly mixed with the oil of the bark, when the latter has been dear, though not used for preparing the water; at the present time it is very difficult to obtain essence of lemon in a state of purity, as well as other essential oils which could be mentioned. Rose water prepared with otto is less stable than that distilled from the petals, although the addition of a little good otto to the distilled water improves it as a perfume. Aniseed water is not in the Pharmacopœia, but it is frequently ordered. Made from the oil, it is poor and very soon spoils; distilled from the fruit, it keeps well, and is very agreeable, and might often be prescribed with advantage as a menstruum in mixtures for children. It has a sweet flavour, and is not too pungent. It would pay any one having a still to prepare it by distillation, rather than make it with the oil, either extemporaneously or otherwise. Fennel water is but little employed in the southern part of England, except occasionally in eye lotions; like aniseed, it would keep but indifferently if prepared with the oil. Distilled vinegar is another case where distillation is necessary, the difference between distilled vinegar and dilute acetic acid being too perceptible and too gratefully different to be overlooked; the stove or furnace for heating the still which should be a movable one might be constructed so as to receive a sand-bath, and the vinegar might be distilled from a glass retort. Spirit of nitre and aromatic spirit of ammonia must be prepared by distillation from a retort attached to Liebig's or other condenser; and here gas, with a proper burner, can be usefully employed. Although, allowing for breakages, it may not be commercially advantageous to make these upon a small scale, all pharmacists should be acquainted with the processes, and able to manipulate them, and every student should prepare them during his term of tutelage. Masters can scarcely be said to do their duty by apprentices, if they neglect practically to initiate them into these matters. One can well conceive the anxiety of the young hand over his first quart of spirit of nitre in years gone by; how he would feel the receiver to be assured it was cool; how he would sniff at any indication of an escape; how warm he would become at an occasional bumping; and how pleased when the required quantity was obtained, the retort and receiver separated and put carefully away without an accident, preserving the residue in the retort for a future operation. Professor Redwood's process in the Phar. Brit. has relieved the operator from these as well as other anxieties about this preparation.

I have already stated that in some pharmacies the tinctures are bought, which is to be regretted for several reasons. They require for their preparation, an iron mortar or mill, a sieve or two, a root-cutter, a percolator or macerator, or better still, the two in one, furnished with a tap, and lastly, a press made of galvanized iron, large or small, according to circumstances. The tinctures can be made better, and thereby cheaper, than they can be bought, and they can be turned out with little variation. By what system of tuition can a pupil or apprentice be taught the nature and composition of a tincture so well as by that of reducing to a proper condition for being operated upon, the several constituents of any or every tincture? In the preparation of tinctures, the question has often occurred to myself, and, as I find, to others,—I may mention Messrs. Giles and Greenish,—whether the *modus operandi*, and the nature of the menstruum as at present ordered, are always the best that could be devised? whether proof-spirit might not sometimes be replaced by a stronger or weaker spirit? and whether spirit and water should always be used mixed, or whether they might not be made in some cases to act upon the ingredients separately, sometimes the spirit first, and sometimes the water? and whether a powdered or bruised state of the ingredients is the better? I have endeavoured upon a former occasion to show that tincture of calumba can be more advantageously prepared from the root in a sliced condition; and I believe that this would apply to all material containing much starch. I may here mention other preparations requiring vessels or apparatus similar to those used for tinctures, namely, the fluid extracts, and the liniments of aconite and belladonna; acetum cantharidis and liquor epispasticus requiring a suitable glass percolator.

It is always good employment of spare time to make small quantities for home consumption of such preparations as citrate of potash, saccharated solution of lime, saccharated carbonate of iron, the solutions of iron, solution of arsenic, solution of subacetate of lead, syrup of iodide of iron, syrup of phosphate of iron, and many others. Amongst the preparations of which there is a considerable consumption, and of which the public are good judges, and prefer the make of certain houses, may be instanced compound decoction of aloes, aqueous extract of the same, compound extract of colocynth, compound rhubarb pill, confection of senna, and compound rhubarb powder or Gregory's powder. Is this preference of a discerning public to be wondered at, knowing, as many pharmaceutists do, that these have been prepared not always in accordance with prescribed formulæ as to ingredients? With the conveniences before mentioned, the green extracts, and nearly all the others, can be made readily. The compound pills, as a rule, and the compound powders can be as easily made, or mixed, as a pound of tooth powder, with the help of a good-sized mortar and a sieve. The syrups and oxymels should be made at home; decoctions and infusions follow as a matter of course, gas being all that is necessary as the source of heat.

The ointments, with one or two exceptions, can be as advantageously made as bought, and these probably are more frequently made than many other things. The liquors of hemlock, broom and taraxacum require only elbow grease and pressure. The much abused (and in many instances deservedly so) granules may be prepared, more especially those which become changed after a certain time. I may mention those particularly which contain iron. Of the wines of the Pharmacopœia I would particularly draw attention to those of opium, ipecacuanha, colchicum and iron. These are the most important, and for the wine of opium I would advise every one to prepare the extract, and prepare it carefully; to select the ipecacuanha root and colchicum corms for those wines. The iron wine may be readily and uniformly made by following three suggestions: employing the same quality of wine at all times, keeping the iron wire above the wine and not clearing out the jar in which it is made, but adding from time to time fresh wine. By this mode of proceeding it will be always dark enough, sweet enough, and as well charged with iron as it can be.

It may be asked, cannot some of the Pharmacopœia chemicals be equally well prepared? When I commenced this paper I had in my mind the galenicals as coming really within the province more especially of the pharmacist, and as being within the scope of his premises. The manufacture of chemicals requires especial apparatus, extensive premises and a large practical experience to make them advantageously in any respect. Nevertheless, as these lines have been penned especially with the view to an improved practical acquaintance with processes in the future, and the better instruction of apprentices, I would add that I should like to hear of students and apprentices being instructed in the preparation of the Pharmacopœia chemicals upon a small scale.˙ The outlay for the necessary apparatus would not be large in proportion to the return in point of information gained. Most things may be accomplished on a small scale equal to the purposes of instruction, and quite sufficient to prepare a student for hearing lectures with benefit, afterwards following, if required, a more complete and scientific course of laboratory work: they would thus be prepared, as some pharmaceutical students now are, for more readily receiving that instruction.

If there be any reality in what I have written, no pharmaceutist or student need have many unoccupied hours. But leisure moments are to the hard worker as needful as sleep; whether those moments be spent in reading, in amusement, or in throwing stones into the sea, they are necessary to a healthy condition of mind and body; and I trust that the time is fast approaching when, upon this point, there will be but one opinion. For the deficiency of practical knowledge in manufacturing pharmacy, I find fault with no one; I simply write that which I believe to be fact. That the apprentice of the future may have more and better opportunities of becoming acquainted with the details of his calling, is that which I truly desire.

VESICATING INSECTS.

BY M. C. COOKE, M.A.

(*Continued from page* 703.)

Black Brazilian Blister Fly, *Lytta anthracina*, Erich.; *Cantharis anthracina*, Erichson in Schomburgk, Reis. in Brit. Guiana, iii. p. 566. 1848; entirely black; the head and thorax somewhat shining, the elytra dull. The head moderately thickly, distinctly but somewhat finely punctured, with a well-marked impression on the forehead between the eyes, a finely impressed line runs from this impression over the vertex of the head. The antennæ are $\frac{5}{6}$ of the length of the elytra, the first joint is short, the second $\frac{2}{5}$ the length of the first, the third rather longer than the first and second together, the following joints subequal and rather shorter than the third joint, all the joints cylindrical. The thorax rather narrower than the head, subquadrate (but a trifle broader than long), very slightly narrower towards the front, where it is abruptly contracted, with a shallow longitudinal impression above, reaching to the posterior margin, but with no distinct fovea; the upper surface is thickly, distinctly, but not strongly punctured. The elytra are scarcely broader at the apex than at the base, each elytron rounded at the apex, the extreme apex slightly shining. The sternum and abdomen are more or less clothed with moderately long black pubescence. The anterior femora are furnished on the inner side with an ovate spot of golden pubescence. The extreme base of the first joint of the posterior tarsi is red-brown. (*C. W.*)

Found in Brazil. Mr. H. W. Bates states that this is an excellent vesicant, and that when he was on the Amazons a medical friend was in the habit of employing them for that purpose. Species of this genus are very rare in Brazil, and this is the only one of which he had any knowledge of having been tested as a vesicant in the parts he visited.

Banded Blister-fly, *Lytta vittigera*, Bl.; *Pyrota vittigera*, D'Orb. Voy. Entom. 200. t. 15. f. 7; yellowish; antennæ black, rufous at the base; head and thorax spotted with black; elytra punctate at the base, with a circular black band at the apex; abdomen banded with black, feet tawny; femora, tibiæ and apex of the tarsi black.

Native of Santa Cruz.

Mendoza Blister-fly, *Lytta viridipennis*, Burm.; black; elytra metallic green; feet yellow.—*Cantharis viridipennis*, Burmeister, Revista Farmacéutica Buenos Ayres, Jan. 1865; Pharm. Journ. ser. ii. vol. vi. p. 548.

Inhabits South America.

This, says Burmeister, is one of the largest of the species found in South America, and has occurred in Catamarca and Mendoza, and probably along the whole western side of the republic (La Rioja, San Juan), at the foot of the Cordillera. It is nearly an inch in length, of a black colour, with yellow feet and metallic-green elytra. He thinks that it is probably the most efficacious of the Argentine species, and adds that the apothecaries of Mendoza employ it with very good effect.

This completes our *résumé* of the second group of Vesicants the *Cantharidæ*. Although by no means certain, that we have included all the species that have been tested˙ or employed, we, at least, feel assured that all the most important have been enumerated. It is exceedingly probable that vesicating powers exist in nearly all, if not all, the species of the *Cantharidæ*, of which 230 are enumerated by Gemminger and Herold as belonging to their genus *Cantharis* alone.

IX. European Meloeidæ.

The third group into which we have divided the vesicating beetles consists of the *Meloeidæ*, or oil beetles, of which several have been employed in Europe, one in Asia, one in North America and at least four in South America. None of these are of commercial importance, and all seem to be inferior both to the *Mylabridæ* and to the *Cantharidæ*. Our notice of them will therefore be brief.

Schæffer's Cerocoma, *Cerocoma Schæfferi*, Fabr.; *Meloe Schæfferi*, Linn.; green; antennæ and feet yellow.—Fab. Syst. p. 262; Schæff. Icon. t. 53. f. 8, 9; Oliv. Ent. n. 48. t. i. f. 1 *a–d*.

Found on flowers in Europe.

The antennæ are yellowish. The head, corslet, the elytra and the abdomen are of a brilliant green, slightly pubescent; the feet are yellowish. The tarsi are of a darker colour. This insect is from five to seven lines in length, and is an active flyer. Moquin-Tandon includes this species in his 'Medical Zoology,' adding, "there are several other species belonging to the genus *Cerocoma* in France, in Spain and in the East, but their vesicating properties have not been investigated."

Common Oil-beetle, *Meloe proscarabæus*, Linn.; black, with a bluish tinge; head and thorax punctured, and with their sides violet, the latter margined behind; elytra rough; abdomen with a rough patch on each segment; legs and antennæ violet, tip of latter pitchy.—Leach, Linn. Trans. xi. t. vii. f. 6, 7; Brandt and Ratzb ii. t. xvi. f. 4, 5. *Proscarabæus vulgaris*, Steph. Man. n. 2626. *P. rugicollis*, Steph. Man. n. 2627.

Fig. 15.—*Meloe proscarabæus.*

Length of male 1 in. 2 lin., female 1 in. 7 lin. Meadows, etc. Europe.

This is one of the species cited in Moquin-Tandon's 'Medical Zoology,' and is included by Brandt and Ratzeburg.

ROUGH OIL-BEETLE, *Meloe rugosus*, Marsh; black; head and thorax with confluent punctures; elytra irregularly punctured, the punctures confluent, and the interstices glabrous; suture slightly pilose.—*Meloe autumnalis*, Leach, Linn. Trans. xi. t. vi. f. 7, 8. *M. punctatus*, Steph. Man. n. 2631.

Fig. 16.—*Meloe autumnalis.*

Length from 5 to 9 lines.

Meadows. This is another of the species referred to by Moquin-Tandon. He indicates as a distinction between this and the last-named, that the elytra are extremely rugose, whereas in *M. proscarabæus* they are only slightly so.

(*To be continued.*)

NOTES ON THE PROPERTIES OF THE GERANIEÆ.

BY JOHN R. JACKSON, A.L.S.,
Curator of the Museums, Kew.

Geraniums, or more properly pelargoniums, are with us the most popular and best known garden plants. The Order to which they belong, including the tribes *Oxalideæ* and *Balsamineæ*, number about 750 species. ~~It is~~ represented with us by the crane's-bill (*Geranium*), the stork's-bill (*Erodium*), the wood sorrel (*Oxalis*), and the balsam (*Impatiens*). It is, however, more particularly of the tribe *Geranieæ* that we have now to speak. It is widely distributed in various parts of the world, the plants often assuming very different forms from those we are accustomed to recognize as members of the tribe amongst our native or cultivated garden plants. The family is certainly not valuable, either in a medicinal or economic point of view, yet its characteristic properties are astringent and aromatic, many having a fragrant and some a musky odour. None of the British species are used in any way by us; but in North America *Geranium maculatum*, L., known as the crane's-bill, crowfoot, or alum root, is considered a medicinal plant, and is used as a powerful astringent in chronic diarrhœa, leucorrhœa, etc., and as a substitute for kino, catechu, and the more expensive remedies of a similar class. Being devoid of any unpleasant taste, it is well adapted for infants and delicate persons. The root is the part employed, and it is given either in substance or in the form of tincture, decoction or extract.

The crane's-bill is described in Wood and Bache's 'Dispensatory,' as "growing throughout the United States in moist woods, thickets and hedges, and generally on low grounds. It flowers from May to July, and the root for medicinal purposes should be collected in autumn. When dried, the root is in pieces from one to three inches long, from a quarter to half an inch in thickness, somewhat flattened, contorted, wrinkled, tuberculated and beset with slender fibres. It is externally of an umber-brown colour, internally reddish-grey, compact, inodorous, and of an astringent taste, without bitterness or other unpleasant flavour. Water and alcohol extract its virtues. Tannin is an abundant constituent." These roots are used throughout the United States, not only as an officinal medicine, but also as a popular domestic remedy. For administering to children they are usually boiled in milk.

In South Africa, which is the head-quarters of the genus *Pelargonium*, several of the species are used medicinally; thus *P. triste*, Ait., has a tuberous, slightly astringent root, which, when dried and pulverized, is used in diarrhœa and dysentery; and it has also been recommended as a vermifuge. These roots, in a fresh state, have been eaten by the natives as food. Another tuberous-rooted species is *P. antidysentericum*, E. et Z.; these roots are called *t'Namie* by the natives of Namaqualand, where the plants grow; they are often as large as a man's hand, and are boiled in milk and used in dysentery. Amongst other medicinal *Pelargoniæ* of the Cape may be mentioned *P. scutatum*, Sweet., called by the colonists the Kaffir sorrel. It is a shrubby plant common in many parts of the eastern districts. The leaves are said to have astringent and antiseptic properties, and to be useful in cases of sore-throat, etc. From the petals of the flowers a juice of a blue colour can be expressed, which Burchell, the celebrated South African traveller, suggested might be found useful for painting. *P. cucullatum*, Ait., is also a shrubby plant, very common on the side of Table Mountain: "It has been recommended in the form of decoction, or as an enema in colic, nephritis, and suppression of urine, and is also an excellent emollient." It is said that this plant was formerly exported to Holland as *Herba Altheæ*. *P. anceps*, Ait., is a herbaceous plant, with small crimson flowers; it is called *Roode Rabassam* by the natives, who use it for promoting parturition and to procure abortion.

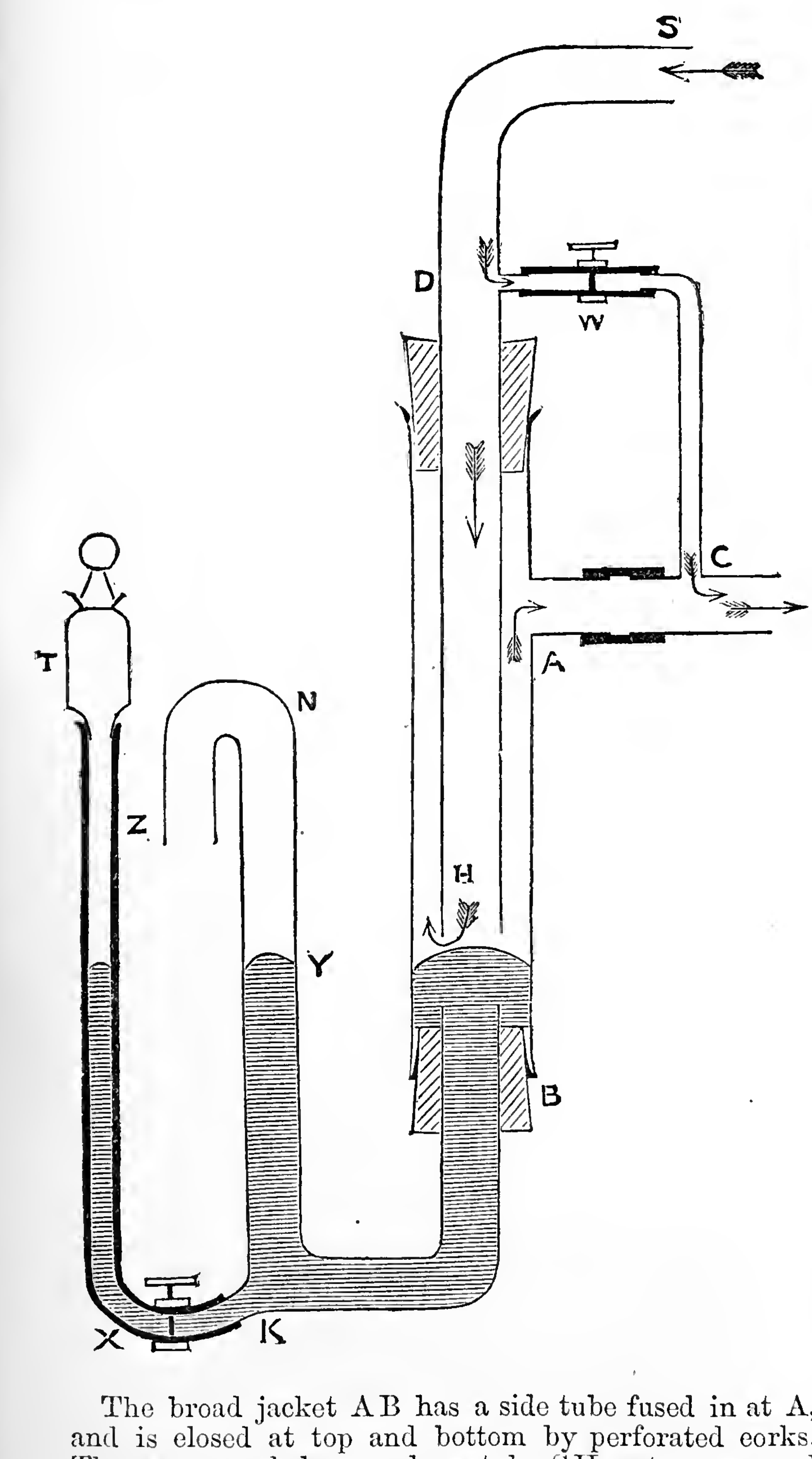
P. roseum, likewise a Cape species, is valuable on account of its yielding an essential oil much used in perfumery. This plant is very extensively cultivated in the south of France and by the rose growers in Turkey. The oil is obtained from the leaves of the plant, one hundredweight of the latter yielding by distillation about two ounces of essential oil; it has a smell very similar to otto of rose, and is much used for adulterating that valuable article; it is, moreover, said to be frequently adulterated itself with the oil of *Andropogon*, which is considerably cheaper, and is imported in large quantities from the East.

Next to the genus *Pelargonium*, the most interesting, perhaps, with regard to its products is *Monsonia* or *Sarcocaulon*. The plants have mostly fleshy spiny stems, which secrete or deposit a large quantity of a waxy or resinous substance; *S. L'Heritieri* and *S. Patersoni*, are, perhaps, more highly endowed with this power than any other species. This substance seems to be formed in the bark, and in such large quantities, that the stems become, to all appearance, a mere mass of wax, moulded to the form and shape of the stem. It is of a greenish-yellow colour externally, in fracture very like that of gamboge but rather more transparent; it burns like caoutchouc, but with a slightly aromatic smell. In alcohol it becomes softish and partially plastic, and a similar effect is produced upon it by boiling water. It breaks with a short fracture, like a resin, so that it seems to possess a combination of waxy, resinous and elastic properties. As the stems of the plants become old the vegetable tissues seem to be displaced by the formation of this substance, so that becoming a mass of inflammable matter, they are used by the natives for candles or torches. Some fine specimens of this substance are in the Kew collection. The root and herb of *Monsonia ovata*, Cav., called by the Hottentots *Keita*, are astringent, and are used by them in dysentery.

AN AUTOMATIC THERMO-REGULATOR, FOR USE IN THE PREPARATION OF NITROUS OXIDE AND OTHER GASES.

BY FRANK CLOWES, B.SC. LOND.

The accompanying diagram represents in section a modification of the usual air-bath thermo-regulator. It was devised to control the source of heat in the preparation of large quantities of nitrous oxide gas for anæsthetical purposes. It has been in constant use for some time in the laboratory of a distinguished dentist, and has performed its duty perfectly. Its simplicity and efficiency will probably recommend its adoption in laboratories where large quantities of any gas are prepared, whose rate of evolution is dependent upon the amount of heat furnished by a gas-stove or burner.



The broad jacket AB has a side tube fused in at A, and is closed at top and bottom by perforated corks. The upper cork bears a long tube SH, cut square and slightly rounded in the flame at its lower end, which descends nearly to the bottom of the jacket; it has a small tube fused on at D. To ensure the efficient action of the apparatus, the axis of the tube DH must be made to coincide with that of the jacket AB. The lower cork is traversed by a bent tube, NKB, one of whose ends only just passes through the cork; it has a small piece joined on at K, on which fits an india-rubber tube carrying at its upper extremity a small reservoir T, which is suspended by a wire loop to a peg, and can be raised or lowered at will. The side tube at A is joined by india-rubber with a T-piece, C, one branch of which is united by an india-rubber tube, bearing a screw-clamp, with the small side-piece at D, the other branch communicating by gas-tubing with the burner.

When the apparatus is required for use, mercury is poured in at T until it rises sufficiently high in the cylinder to close the lower end of the tube HD; the supply-tube from the gas-pipes is then fitted on at S, the gas passes through SDWC in the direction indicated by the arrows, and is lighted as it issues from the burner; the clamp at W is then tightened until the amount of gas passing to the burner is just sufficient to prevent the flame from being extinguished: the reservoir T is lowered, the clamp at X opened, and the mercury-level in the jacket allowed to fall considerably below the end of the tube SH, so as to give a full supply of gas to the burner through SH. As soon as the gas is being generated in the apparatus at a proper rate, the tube BKN is connected at Z by india-rubber with one of the wash-bottles of the generating-apparatus, whence the gas pressure acts upon the mercury-level at Y; the reservoir T being raised, the clamp at X is carefully opened, and the mercury-level in AB allowed to rise until the gas flame just begins to diminish in size; the clamp is then closed. When the pressure of the generated gas increases, it will depress the level at Y, raising the mercury in AB, and diminishing the supply of coal gas, and *vice versâ;* the supply of coal gas to the burner varying inversely as the pressure in the generating apparatus. It was found unnecessary to use a conical float on the mercury, or a slit at H, as the convex surface of the mercury rendered the arrest and renewal of the gas-current sufficiently gradual. The apparatus is drawn pretty nearly to scale; the diameter of the tubes SDH and AC should be about the same as that of the ordinary india-rubber gas-tubing, so as not to impede the free flow of gas to the burner; the diameter of the little side passage DWC may be much less, its object being merely to supply sufficient gas to prevent the total extinction of the flame by a sudden rise of pressure in the generating apparatus; the relative diameters of NYK and AB, must depend upon the rise of mercury-level required in AB. The apparatus was attached to a flat board and suspended upon the wall of the laboratory.—*Journ. Chem. Society.*

ESSENTIAL OILS.*

BY J. H. GLADSTONE, PH.D., F.R.S.

PART II.

(*Concluded from page* 705.)

OILS CONTAINING OXYGEN.

Many of the essential oils consist, as is well known, of a body containing oxygen, mixed usually with a hydrocarbon of the first or second group. This is sometimes a product of the direct oxidation of the hydrocarbon, and then is generally a feebly acid resin; but in most cases the relation between the two is not apparent. Few of these oils have hitherto been carefully studied. My attention has been confined almost exclusively to those neutral oils which contain only one atom of oxygen.

* Read before the Chemical Society, Dec. 7, 1871 (*Journ. Chem. Soc.* [2] x. i.).

Citronella.

The oxidized oil of which citronella is principally composed was submitted to analysis. It was purified by repeated fractional distillation till the boiling-point was nearly uniform. Combustions were made in the usual manner.

I. Substance boiling at 202°–205° C. Specific gravity at 20° C., 0·8749. 0·4288 grm. gave 1·2230 grm. of carbonic acid and 0·4215 grm. of water.

II. Substance boiling at 199°–202° C. Specific gravity at 20° C., 0·8741. 0·396 grm. gave 1·1355 grm. of carbonic acid and 0·386 grm. of water.

These numbers indicate the composition $C_{10}H_{16}O$.

	Experiment.		Calculated.
	I.	II.	
Carbon	77·78	78·19	78·94
Hydrogen	10·92	10·83	10·53
Oxygen (loss)	11·30	10·98	10·53
	100·00	100·00	100·00

This was verified by a determination of the vapour-density.

Difference between weight of air and vapour	0·2912 grm.
Temperature of balance case	8° C.
Temperature of sealing	254° C.
Capacity of globe	110·8 c.c.
Residual air	0·6 c.c.
Calculated density of vapour	5·83.

The theoretical density should be 5·33, but there was a brown stain left in the globe.

I propose naming this oil citronellol, in accordance with the usual plan of adopting -ol as the termination of the names of bodies of this nature.

The oxygenized oil obtained from wormwood is said also to have the composition $C_{10}H_{16}O$, but its physical properties are very different, as will be seen by the subjoined table, in which I have called it *absinthol*, to distinguish it from the hydrocarbon.

Oil.	Specific gravity at 20° C.	Boiling point.	Refractive Index A at 20° C.	Dispersion.	Sensitiveness.	Specific refractive energy.	Circular polarization.*
Citronellol, Penang	0 8742	200°	1·4563	0·0251	50	·5219	—
Do. Ceylon	0.875	200°	1·4594	0·0262	46	·5251	— 13
Absinthol	0·9267	217°	1·4543	0·0243	43	·4903	+ 134

The refraction equivalent of citronellol is, therefore, 79·3 or 79·8, instead of the theoretical 73·7, as deduced from the composition $C_{10}H_{16}O$, while the equivalent of absinthol is only 74·5. The discrepancy in the case of citronellol is about the same as is found throughout the great phenyl group, as shown in my paper in the Journal of this Society (year 1870, p. 147), and if the two oils are really isomeric, it suggests an interesting difference in their molecular constitution.

Cajeput.

The oil of cajeput of commerce is said to be obtained from the leaves of *Melaleuca Leucadendron*, but the same oxidized compound was evidently the principal constituent of the oils derived from the leaves of *Melaleuca ericifolia* and *Melaleuca linarifolia*, as well as of *Euca lyptus oleosa*, oils sent to this country from the colony of Victoria.

This compound, though containing oxygen, may be distilled unchanged from metallic sodium. In this way the oils were freed from other oxidized products, and the specimens thus obtained exhibited the following physical properties:—

Oil.	Specific gravity at 20° C.	Boiling-point.	Refractive Index A at 20° C.	Dispersion.	Sensitiveness.	Circular polarization.
Cajeput	0·9160	174°	1·4532	·0213	45	— 2 ?
Melaleuca ericifolia	0·8960	173°	1·4560	·0239	48	+ 30
Melaleuca linarifolia	0·8985	173°	1·4651	·0263	46	+ 11
Eucalyptus oleosa	0·9075	171°–176°	1·4563	·0227	44	+ 10

The composition of cajcputol is well known to be $C_{10}H_{18}O$; the refraction-equivalent of the specimen examined was, therefore, 76·2, which accords with the theoretical equivalent 76·3.

Carvol and its Isomerides.

In my previous paper it was stated that the oils of spearmint and nutmeg contain oxidized liquids, which appear to be isomerides of carvol, the principle which gives its peculiar flavour to the oil of caraway. They were named respectively menthol and myristicol. These have been submitted to a fuller investigation, and it has been found that oil of dill also yields a substance isomeric, or perhaps identical, with ordinary carvol.

There are two ways in which these oxidized oils may be separated,—either by fractional distillation, which must always be an imperfect method, or by taking advantage of the fact that they form crystalline bodies with hydrosulphuric acid, which can be easily purified, and which yield the original oil when decomposed by an alkali. The oil from nutmeg, however, was not to form such a compound.

The following are the physical properties of the substances above mentioned. Menthol I. was prepared by fractional distillation. Menthol II. was prepared from the hydrosulphuric compound.

Substance.	Boiling-point.	Specific gravity at 20° C.	Refractive Index A at 20° C.	Dispersion.	Sensitiveness.	Refraction equivalent.	Circular polarization.
Carvol	227°	0·9530	1·4886	0·0345	46	51·26	+ 145°
Dill carvol	—	0·9562	1·4891	0·0333	45	51·15	+ 108°
Menthol I.	225°	0·9515	1·4839	0·0326	44	50·86	— 103°
Menthol II.	225°	0·9394	1·4791	0·0311	42	51·01	— 114°
Myristicol	224°	0·9466	1·4848	0·0312	46	51·21	+ 31°

Dill Carvol.—The oxidized oil obtained from dill has the same odour as that from caraway, an odour which can scarcely be confounded with any other. Like carvol also it forms a crystalline compound when treated with sulphide of ammonium in alcohol. 0·527 grm. of these crystals oxidized by strong nitric acid, and treated with barium salt, gave 0·360 grm. of sulphate of barium.

This result agrees with what should be obtained from the known hydrosulphate of carvol $(C_{10}H_{14}O)_2H_2S$.

	Calculated.	Found.
Carbon	71·86	—
Hydrogen	8·98	—
Oxygen	9·58	—
Sulphur	9·58	9·37
	100·00	—

I am disposed, therefore, to regard this compound derived from dill as identical rather than isomeric with carvol.

Menthol.—This compound has the very characteristic odour of spearmint, totally different from that of carvol, and it retains the same odour when it has been reproduced from the hydrosulphate.

A combustion was made. 0·3945 grm. yielded 1·159 carbonic acid, and 0·3415. This agrees with the formula $C_{10}H_{14}O$.

* As in the previous paper, the circular polarization is given as actually measured in a tube ten inches long. It can, of course, be easily reduced to any scale that may be preferred.

	Calculated.	Found.
Carbon	80·00	80·10
Hydrogen	9·33	9·62
Oxygen	10·66	—
	100·00	

Two determinations of the vapour-density were made.

Difference between weight of air and vapour	0·2425	0·2897 grm.
Temperature of balance case . .	12° C.	12° C.
Temperature of sealing	277° C.	259° C.
Capacity of globe	97·2 c.c.	115·3 c.c.
Residual air	2·6 c.c.	1·3 c.c.
Calculated density of vapour . .	5·98	5·94

These are both rather above the calculated density, namely, 5·29.

The hydrosulphate forms very readily, giving silky needle-shaped crystals of great beauty. 0·442 grm., oxidized by nitric acid, gave 0·306 of sulphate of barium. 0·2227 grm., oxidized by hydrate of potassium and chlorine, gave 0·1605 grm. of sulphate of barium. These determinations give respectively 9·80 and 9·89 per cent. of sulphur, instead of 9·58.

As the composition of these crystals seemed to be the same as that of the hydrosulphate of carvol, and yet they yield a different oil on treatment with alkali, their relative solubility in ether was examined. At 23° C. one part of the hydrosulphate from the three sources required the following amount of ether to dissolve it:—

From Caraway . . . . 226 parts.
„ Dill . . . . . . 279 „
„ Spearmint . . . . 216 „

Myristicol.—This oil has the characteristic smell of nutmeg, and, unlike the preceding oils, it does not form a crystalline compound with hydrosulphuric acid.

It was found very difficult to purify it by fractional distillation; indeed there was some reason to think that in the process of rectification it was subject to change. An ultimate analysis of portions boiling at somewhere about 220° C. yielded rather too much carbon and hydrogen for the formula $C_{10}H_{14}O$, suggesting the idea of its being still mixed with some amount of a hydrocarbon. The vapour-density was determined.

Difference between weight of air and vapour	0·2512 grm.
Temperature of balance case	9° C.
Temperature of sealing	259° C.
Capacity of globe	99·8 c.c.
Residual air	0·6 c.c.
Calculated density of vapour	5·71.

This shows at least that myristicol belongs to the C_{10}, and not the C_{15}, or any other group. It accords with theory better than the numbers obtained for menthol do; and the other physical properties resemble those of carvol and menthol so closely that there can be little doubt it is isomeric with them.

Cassia.

The extremely refractive and dispersive properties of oil of cassia have long been known to physicists. They depend on a substance that is now recognized as hydride of cinnamyl C_9H_8O. A careful preparation of this was made by the sulphite of sodium process, and it gave the enormous refraction of 1·6045 for A at 11° C. As the specific gravity was 1·059, the refraction-equivalent of the oil was 75·3, being an excess of 17 over the equivalent calculated from its ultimate composition. This excess is greater than that of any other substance known to me, except anthracene, and may, perhaps, throw some light on the molecular constitution of the compound. This interesting question of the refraction equivalents of these hydrocarbons and oxidized oils has already been referred to in a paper published in our Journal for May, 1870, and I shall probably some day revert to the subject.

Other Oxidized Oils.

In addition to the substances already described, there are several oxidized compounds which have been separated more or less perfectly, and have been examined in regard to their physical properties, though they have not been analysed.

Oxidized Oil, from	Specific gravity.	Boiling-point.	Refractive Index A.	Dispersion.	Sensitiveness.	Rotation.
Rose	0·881	216°	1·4647	·0283	47	—
Indian geranium . . .	0·884	—	1·4692	·0295	59	— 3
Atherosperma Moschatum	1·0386	224°	1·5143	·0460	46	+ 10
Lign Aloes	0·8640	200°	1·4601	·0280	—	—

IMPROVED PROCESS FOR PREPARING EMULSIONS OF LIGHTER VOLATILE OILS, ETC.

BY J. WINCHELL FORBES.

Of all the processes incident to extemporaneous pharmacy, there is, perhaps, no one so vexatious and tiresome as the preparation of an emulsion, especially one containing chloroform, ether, or one of the lighter volatile oils, and any improvement upon the usual "elbow-grease" method will, I am confident, meet with a hearty welcome from every practical apothecary.

In order to illustrate, let us imagine the following recipe handed to an apothecary for preparation:—

℞ Ol. Terebinth.
Mucil. Acaciæ ana ℥j.
M. ft. Emulsio S.A.

"Secundum artem." Very good, and what is the law of the art?

In the articles upon mixtures in the U. S. Dispensatory, it is directed that when gum acacia is specified as the intermedium of an emulsion, it shall be brought "previously" into the form of U. S. P. mucilage.

At the risk of being considered presumptuous, I take the liberty of flatly contradicting this direction, disregarding the "previously" and proceeding as follows:—

First. Pour the turpentine into a two-ounce vial, and shaking so as to coat the inside of the vial with a film of turpentine; this is to prevent the action of the moisture usually present.

Secondly. I add ℈j powdered acacia, and mix thoroughly with the oil.

Lastly. Half a fluid ounce of water is added and the whole is well shaken. A perfect emulsion is the result, requiring less time for its preparation than to read the foregoing directions. The bottle may then be filled up with mucilage, or, according to my experience, a better product is obtained with water simply.

The deviation from the letter of the law in regard to the gum strength of the emulsion needs no apology to the practical pharmacist, as the sole object in view is to emulse the oil, and it will be found that ten grains to the fluid ounce of emulsion will afford a product superior in all respects (especially in fluidity) to one containing more gum, and more nearly approaching the peculiar characteristics of that most perfect of all emulsions—cows' milk.

An emulsion of turpentine prepared in this manner and allowed to stand some time, shows not the least separation of its oil, but floating on the surface of the water is a stratum of a true "cream," which, like its prototype, requires but slight agitation to mix thoroughly with its substratum.

I have for some time past kept an emulsion of oil of turpentine prepared as above, containing half its volume of oil, for use in dispensing, and as the oil is perfectly emulsed, its incorporation in any desired amount of mixture or vehicle requires no more labour or skill than in the case of a tincture or syrup. I find, also, that the emulsion rather improves by standing, the "cream" becoming more homogeneous.

It is often desirable to administer this oil in quite large doses, and it will be found that a mixture of one part of an emulsion of the above strength, with three parts of syr. wild cherry will give a preparation that is rather pleasant than otherwise, both as regards taste and odour.

Actual experiment has demonstrated that this method is applicable to all liquids that possess no solvent power as regards gum acacia, and that possess a reasonable degree of mobility. In accordance with this fact it will be found that ether and chloroform, when treated in this manner, will yield perfect emulsions, and, as the operation is conducted in a close vessel, the loss sustained in the usual process is not incurred.

The principle upon which this process is based is very simple. In the usual mortar process the cohesiveness of the intermedium has to be overcome, it being directly opposed to the union desired, whereas in the new, the same condition of the gum does not occur until after the union, being then opposed to their separation.—*American Journal of Pharmacy.*

FLUID EXTRACT OF VANILLA.

BY J. B. MOORE.

This preparation, though usually called a fluid extract, is in reality only a tincture in the common acceptation of the term. The rich and delightfully aromatic qualities of vanilla have given to its fluid extract an importance and popularity unsurpassed by any other flavouring substance. While it is indispensable to the housekeeper and confectioner, it is also of importance to the pharmacist and perfumer. Alone or associated with other flavouring substances, it is often employed by the pharmacist to conceal or modify the taste and odour of many unpleasant remedies.

In making this fluid extract it is absolutely essential to the success of the operation that the vanilla be reduced to a fine state of division, and it is in performing this operation that the operator encounters the greatest difficulty. The peculiarly tough texture of the shell not only renders vanilla very difficult to powder, but it also offers an obstinate resistance to the action of solvents; and unless it is reduced to a sufficiently fine powder, to enable the menstruum to exert its full solvent power, it cannot be entirely exhausted.

I have tried during the last few years a variety of methods of making this fluid extract, and with variable success, until I adopted the following plan, which, having been tested by repeated trials with uniform success, I deem of sufficient importance to offer to the readers of this journal.

℞ Vanilla,
Sugar, Crushed Loaf, ana ℥viij troy
Alcohol,
Water, each, sufficient quantity.

Slit the pods from end to end with a knife; then take them in small bundles, held tightly between the fingers, and cut them transversely into very small pieces. Of these, beat small portions at a time in an iron mortar, with a little of the sugar, until reduced to a damp powder, which must be rubbed with the hand through a No. 20 sieve; any coarse particles which will not pass through the sieve must be returned to the mortar, and with fresh portions of vanilla and sugar, again treated as before. This process is to be continued until the whole of the vanilla, with the sugar, is reduced to a No. 20 powder. This is then to be mixed with 5 pints of a menstruum, consisting of 3 parts of alcohol and 1 part of water, and the mixture introduced into a stone jug of the capacity of one gallon, which must be tightly corked. The jug is then to be placed in a water-bath, resting upon folds of paper, and the mixture digested for two hours at a temperature of from 160° to 170°. The neck and shoulders of the jug must be kept cool, to prevent the undue expansion of vapour during the digestion. This can easily be done by wrapping around the neck and shoulders of the jug an old towel or other cloth kept saturated by having cold water squeezed upon it from a sponge every fifteen or twenty minutes. If the jug is of the capacity directed, this will be found to be often enough to apply the water. The jug should also be removed from the bath after each application of the water, and its contents well shaken. In doing this it will be well to keep the hand upon the cork to prevent its expulsion, and perhaps consequent loss of material. When the digestion has been completed, and the mixture has cooled, it is to be expressed through muslin. Pack the residue, previously rubbed with the hands to a uniform condition, firmly in a glass funnel, prepared for percolation, and gradually pour upon it first the expressed liquid, and when this has all disappeared from the surface, continue the percolation with a mixture of 3 parts of alcohol and 1 part of water until 8 pints of percolate are obtained.

When the pods have been well preserved and are very moist, there may sometimes be required a little more sugar than I have directed in the formula to make them powder easily. When this is the case, the necessary additional quantity of sugar may be added, which will make no important difference beyond rendering the preparation a little sweeter, and this is not at all objectionable. But I have generally found the quantity of sugar ordered to be sufficient.

Many substances, such as sand, glass, etc. have been suggested as auxiliaries in the process of powdering vanilla, and either of these may be employed in the above process, instead of sugar, if preferred by the operator, and the sugar can be mixed with the powder afterwards, and dissolved in the menstruum before digestion. But I have always had success when using the sugar, and prefer it to any other substance.

A thermometer should be kept in the water-bath during the digestion, for the purpose of regulating the temperature, which should not be allowed to exceed 170°.

The elevated temperature at which the digestion is conducted very greatly contributes to the ready solution of the active constituents of the vanilla; it softens and expands the tough particles of shell, and admits of the free access of the menstruum (the solvent power of which is also greatly heightened by the heat) to all its parts. The digestion being performed in a close vessel, there is consequently no loss of aroma in the process.

The above is an expeditious and at the same time efficient method of making this preparation, and if the process is managed with care, it will thoroughly exhaust the vanilla. In fact, this is almost accomplished by the digestion itself, as is shown by the circumstance that the dregs after they are expressed are almost tasteless.

In the absence of any recognized standard strength for the fluid extract of vanilla, I have, in the above formula, adopted that which is usually employed, namely, 1 troy ounce of vanilla to 1 pint of menstruum. In preparing it for general use, these proportions are perhaps the best that can be made.

The alcoholic strength of the menstruum to be employed in making the fluid extract of vanilla is also not a matter of indifference, as upon this depends the colour as well as the quality of the finished product. The one I have chosen, consisting of 3 parts of alcohol and 1 part of water, seems to answer the purpose most admirably. Diluted alcohol is not so good a solvent for the virtues of vanilla, and it extracts too much colouring matter, rendering the fluid extract too dark, while alcohol alone affords a preparation objectionably light in colour, and also makes its manufacture rather more expensive.—*American Journal of Pharmacy.*

The Pharmaceutical Journal.

SATURDAY, MARCH 16, 1872.

Communications for this Journal, and books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE EDUCATION QUESTION.

FOR those who take an earnest interest in the advancement and future welfare of the business of pharmacy in this country, argument will be unnecessary in support of the opinion that the question how the rising generation of pharmacists are to be taught the principles and practice of their business, is the most momentous of all the questions which now claim our consideration. Apprenticeship, the old system of initiating youths in the "art and mystery" of various trades, is confessedly no longer adequate to satisfy the wants of the pharmaceutical student. Even when adherence to that system is limited to the reception as apprentices solely of youths who have passed the ordeal of the Preliminary Examination, it is only in exceptional cases that the apprentice can hope for the advantage of such educational training as the law now renders indispensable.

The experience he acquires of shop routine has, no doubt, its value; the daily habit of dealing in some way with drugs and chemicals may give him some familiarity with the materia medica, and the preparation of tinctures, infusions, etc., may enable him to acquire some practical acquaintance with the Pharmacopœia.

By diligent study much more may be done in the way of self-education. But it is rarely that the apprentice is placed in such a position that he cannot fail to obtain such a knowledge of his business as will enable him even to satisfy the present very moderate requirements of the law in regard to competence for carrying on business for himself. The modern tendency towards the subdivision of labour and the special prosecution of particular branches of trade, still further limit the apprentice's opportunity of learning many things which he must know before he can become a pharmacist. The preparation of extracts, tinctures, etc., and even ointments and infusions by wholesale houses, has now become so much the rule that, in many instances, the apprentice may pass through the term of his apprenticeship without much need of coming in contact with the Pharmacopœia at all.

Any suggestion that tends to mitigate these disadvantages of a system which will probably remain in force to some extent for many years to come, must be regarded as a valuable contribution in aid of pharmaceutical progress, and the paper which appears this week from the pen of the PRESIDENT will no doubt be productive of much good in that direction. For the many who are situated in the country, remote from colleges or schools, it is only by some such means as those suggested in Mr. HASELDEN's paper that they can learn anything of the more important details of pharmaceutical practice. Even then chemistry—that subject which may be regarded as most essential of all to the pharmacist—would be only ill provided for, and although the preparation of certain chemicals of the Pharmacopœia would give an insight into manipulation, together with a general idea of chemical action, a satisfactory acquaintance with chemistry requires a greater amount of systematic work than can perhaps ever be looked for as obtainable by youths during their apprenticeship.

How, then, is this to be obtained? Our present school of pharmacy cannot satisfy the want; for, although its benefits are far from being "enjoyed almost exclusively by those who live in London," it must be admitted that those pupils who come from the country represent only a very limited class, and that the Bloomsbury school should be regarded essentially as one for the metropolis. There are many who think that, at some not very remote date, its continuance in that sense should no longer be the business of this Society; but whatever view be taken on that point, the need of educational organizations for the preponderating mass of rising pharmacists remains the same, and it is especially for the Society and its members to consider how, in the common interest of pharmacists and of the public, that want is to be best provided for.

It is with some regret that we have to refer to the fact, that there has not been a more ready response to our invitation, some months since, of discussion on this very important subject in the columns of the Journal; but it is at any rate satisfactory to find that it is receiving attention in the provinces, and if we may judge from the references to it in some recent reports of provincial associations, there are in some quarters evidences of an earnest determination to deal thoroughly with the matter.

THE NEW YORK PHARMACY BILL.

THE Bill for removing the grievances complained of by the New York druggists, arising from the carrying of the Act of last year, by which an examining board was constituted, appointed by the MAYOR, was, after considerable opposition and some modification, on the 28th of February read a third time in the Senate and passed. The circumstances under which the present Bill was drawn up by a joint committee of the different pharmaceutical bodies of New York, have been referred to in this Journal,* and an abstract of its provisions given.† By the last clause the examining Board, which proved so obnoxious, is abolished, and the power of examination is vested in the College of Pharmacy of New York. It may be mentioned as one of the results of the joint effort, that the Committee of the Apothecaries' Union of New York have made a report recommending amalgamation of that body with the College of Pharmacy.

THE LATE PROFESSOR GUIBOURT.

An event of more than local interest occurred in Paris on the 15th of November last, when the School and Society of Pharmacy of that city met for the purpose of hearing an *éloge* of the late Professor Guibourt pronounced by M. Buignet. The name of Guibourt is well known in this country for the services he rendered to pharmacy, but we venture to say that few English pharmacists are aware of the multiplicity and importance of his researches, even so far as revealed in this discourse. When the comparatively small total amount of original investigation in connection with pharmacy in this country is taken into consideration, the thought will occur that an enormous amount of work might be accomplished if some of our pharmaceutists, who do not lack ability, had more of the spirit of the late Professor of the École de Pharmacie at Paris. Professor Attfield's appreciative remarks on a specimen presented to the Pharmaceutical Society at the last evening meeting indicate a direction in which, perhaps, some profitable work might be accomplished. But that there is no scarcity of subjects may be assumed from the following words of M. Guibourt, written to an English friend in 1860, which have before been quoted in this Journal:—"Pour moi, je n'ai plus le tems de rien faire; je rencontre à chaque instant des sujets d'étude qui mériteraient un long examen; j'y jette un regard curieux et je les abandonne, faute de pouvoir continuer."

We think that this tribute, paid to a distinguished pharmaceutist and an honorary member of the Pharmaceutical Society of Great Britain, which is printed at p. 752, will not be without interest to our readers.

In another part of this Journal will be found an abstract of the Bills now before Parliament relating to the Public Health. We are also enabled to print an Act that has been recently passed by the New Zealand Parliament, by which the previous Act, passed in 1866, dealing with the sale of poisons, is repealed, and fresh regulations are prescribed.

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* *Ante*, p. 390. † *Ante*, p. 631.

Provincial Transactions.

BRISTOL PHARMACEUTICAL ASSOCIATION.

Friday, Feb. 9th, 1872.—A General Meeting was held this day; Mr. Townsend, President, in the chair.

The minutes of the previous meeting were read and confirmed.

A lecture was delivered by Edward Collens, Esq., upon "The Progress of Discovery respecting the Atmosphere." At its conclusion, a vote of thanks to the lecturer was proposed from the chair, and carried by acclamation.

Friday, March 8th, 1872.—A General Meeting of the Association was held this day; Mr. Townsend, President in the chair.

The minutes of the previous meeting were read and confirmed.

The President said he had been requested to undertake a duty the fulfilment of which would afford him the highest gratification. It would be remembered that the late President of the Association, Mr. Stoddart, had kindly offered his services in a course of scientific instruction in the materia medica, chemistry, and botany of the Pharmacopœia. The students who had attended that course (some twenty in number) had felt that they were greatly benefited by those services, and were anxious to declare their high appreciation of Mr. Stoddart's kindness and ability. They had recorded their sentiments in the form of an address, which they had had illuminated and framed; and they had requested him, as President of the Association, to present it to Mr. Stoddart in the most public manner possible. He would simply read the address, and offer it in the name of his young friends to Mr. Stoddart. The address was as follows:—

"*To William Walker Stoddart, Esq., F.C.S., F.G.S.*

"Dear Sir,—It is with heartfelt pleasure that we take this opportunity of testifying our gratitude for the valuable instruction you have afforded us in your course of lectures on materia medica and chemistry, delivered to the Associates of the Bristol Pharmaceutical Association, during the Session 1871–72. We deeply feel the obligation due to you for thus helping our steps, directing our studies and enabling us to overcome the many difficulties of qualifying ourselves for the responsible duties of pharmaceutists as now understood and required by law. As students, we are truly sensible of the great advantages we have received, and in after-years we shall continue to remember, with grateful pleasure, the important help which you have so kindly given us.

"In offering our sincere thanks for this particular instance of your anxiety for our credit and future welfare, we beg to be allowed to express the hope that you and your family may enjoy a full measure of the happiness and prosperity which you are ever ready to assist in extending to others.

"We are, dear Sir,
"Ever gratefully yours.
[Fourteen signatures attached.]
"*Bristol, February.*"

In accepting the address, Mr. Stoddart declared the very great pleasure he felt in finding that his efforts had produced so kindly a feeling towards himself in the minds of his young friends. He sincerely hoped it would continue through life. He thanked them most cordially for having chosen so graceful a method of acknowledging his services, and assured the meeting that it was impossible for any teacher to have had a more attentive and painstaking class.

A lecture was then delivered by Wm. Harding Warner, Esq., upon "The consideration of Art in connection with Photography and Light, as the Brush by which our Ideas may be carried out." The lecture was illustrated by a number of specimens produced by Mr. Warner himself, and by others kindly lent for the occasion by the Heliotype Company, by Messrs. Henderson and Co. and by Mr. Woodberry. At its conclusion, a vote of thanks to the lecturer was moved by the PRESIDENT, and carried by acclamation.

BIRMINGHAM AND MIDLAND COUNTIES CHEMISTS' ASSOCIATION.

MR. WENTWORTH L. SCOTT, F.C.S., gave an interesting lecture on "Disinfectants; their Preparation and Properties," to the members of this association, on Thursday evening, February 29th, at the room of the association, Quadrant, New Street, the President, Mr. GEORGE DYMOND, in the chair. A large number of chemicals and utensils were exhibited for the purpose of illustration. The lecturer commenced by saying that the term disinfectant was more a popular than a scientific one, its object being to prevent the development of germs of obnoxious organic matter. For this purpose various disinfectants were necessary. The sad havoc made in our food supply by cattle disease, and the fatal consequences of the spread of cholera and smallpox, had caused the introduction of a number of disinfectants, some of great service others comparatively worthless, if not injurious. There were two classes of disinfectants. First, those which went in search of disease germs and arrested their development, as the preparations of chlorine, carbolic acid, sulphurous acid, bromine; and secondly, those which destroyed the disease germ when brought into close contact with it, viz. metallic oxides, such as permanganate of potash (or Condy's fluid), sulphate of zinc, oxide of iron, etc. He said he had tried many experiments, and had not found chloralum so satisfactory in its results as the old-fashioned disinfectants—chloride of lime, etc.

At the conclusion, the CHAIRMAN spoke in highly eulogistic terms of the lecture. The subject deserved far more practical and scientific attention than at present had been given to it. Man, he said, in matters of health, as in most other things, was his own enemy. When men lived as God intended they should, the want of disinfectants would be unknown; but till then, the duty and desire of the chemist would be to contrive to check the self-destructive hand of man.

It was announced that Mr. Dewson, Queen's Hospital, would read the next paper, on Thursday evening, March 28th.

LEEDS CHEMISTS' ASSOCIATION.

A special Meeting of this Society was held in the Library on Tuesday, March 5th, 1872, the President, Mr. E. BROWN, in the chair, "for the consideration of provincial pharmaceutical education, with special reference to the relation and duties of the Pharmaceutical Society thereto."

The PRESIDENT introduced the subject by reading a letter he had received from Mr. Radley, of Sheffield, and expressed an opinion that whilst the grants from the Council of the Pharmaceutical Society to provincial societies was inadequate to the present requirements, he was decidedly opposed to the project of doing away with the educational classes held at Bloomsbury Square. He was quite sure they would be pleased to hear Mr. Reynolds' views upon the subject, previous to which the Honorary Secretary would read a letter received from Mr. George Ward, F.C.S., who was not able to be present. In this letter Mr. Ward considered that the time had not yet arrived for suspending the educational functions of the Pharmaceutical Society, nor should this work be delegated to similar institutions, until they had undergone considerable expansion and development. With regard to the requirements of the students, Mr. Ward thought classes upon botany, materia medica, etc., should be held during the earlier part of the day rather than in the evening.

Mr. R. REYNOLDS said that in the first place he should bear in mind that it was less his province to offer opinions upon the subject before the meeting, than to lay before it certain facts as to the past action of the Council of the Pharmaceutical Society upon the question of provincial education. He wished that opportunities for the interchange of opinion between members of the Society and their representatives were more frequent, and had sometimes thought that a more definite idea of their mutual relations would be created if representatives were allotted to particular districts. It was well known that at the Annual Meeting held in May, 1870, a resolution offered by Mr. G. F. Schacht was carried unanimously, affirming the desirability of attention to this subject. The new Council took up the matter, and collected and published the statistics of existing educational agencies. In November, 1870, the special Committee on Provincial Education presented its complete report (PHARM. JOURN. Nov. 12). This report discussed the general question, and laid down definite principles to guide the action of the Council.

The chief of these were the following, viz., that the exceptional position of those young men who suddenly found themselves made liable to examination, although finding few existing facilities for education, justified the Society in giving them temporary aid; that it was not desirable for the Society to initiate new schools of pharmacy, but that it should recognize and aid local organizations formed for the purpose of teaching; that the thoroughness of this effort should be the guide to the amount of aid given. Various aspects of the question were pointed out by the report, such as the necessity for young men devoting to their class-studies more time than the fag-ends of days spent in business. The influence of local schools of pharmacy in maintaining and raising the *esprit de corps* of our body was also indicated. The report concluded by suggesting certain conditions for making grants in aid of provincial schools of pharmacy, by which the Council should guide its administrative action. These may summarized as follows:—

1. To increase the fees of teachers of chemistry, practical chemistry, materia medica, pharmacy and botany.
2. To pay one-half the salary of a curator and lecture assistant.
3. To distribute such duplicate specimens from the Society's Museum as might be available.
4. To make grants to libraries.
5. To grant loans of materials for class-teaching, with the power of making them absolute grants.

The Council adopted the report and conditions, and instantly acted upon them by making a grant to chemists in Norwich for the purchase of botanical diagrams.

Mr. Reynolds continued: The matter stood thus for five months, during which period his physical incapacity to attend meetings of the Council prevented his tracing its history. At a meeting of the Council in April, 1871, it is recorded that "the following conditions, etc., were adopted." (PHARM. JOURN. April 15th.) The scope of the new conditions was now limited to two only of the five objects previously accepted, with the addition of a power of lending a collection of apparatus for teaching physics that had been purchased from Dr. Redwood. The objects of the conditions now were:—

1. To make grants to libraries.
2. To make loans of materials for class-teaching, with the power of making them absolute grants.
3. To lend the Redwood collection of apparatus for periods of fourteen days.

No reason for the change of plan has been made public, and it is at least certain that it did not result from the original conditions having proved too generous when reduced to practice. It may be noted that the resolution of April 5th, adopting the conditions, does not withdraw nor allude in any way to the *original* conditions, whilst the retention of a considerable part of their phraseology may have disguised the complete change of system that was being made.

Mr. Reynolds claimed that the *original* conditions (doubtless capable of improvement and further extension) were not open to the charge of entire inadequacy now brought by the Sheffield Chemists' Association against the *new* conditions. He could not but connect such a change as had been made with the present method of reporting the proceedings of the Council. Those members of the Council who objected to their constituents being informed of their proceedings through professional reporters, had staved off the evil day by devising a plan under which three members sent for publication what they pleased. It might have been expected that the reasons for so great a change as that made in the conditions would have been described to the Council by the mover or seconder of the resolution; and if so, the absence of any report is a similar treatment to that applied to debates on provincial education upon other occasions. Members of the Society might with advantage notice that whilst these discussions were withheld, the amateur reporters exercised their functions by publishing such important facts as the following: "Mr. Howlett, having completed some cases and a table, the sum of £58 was ordered to be paid to him."

Mr. Reynolds begged the indulgence of the meeting for now offering a few of the opinions which had been impressed upon his mind by a frequent consideration of this subject. Firstly, all must be agreed that some other agency was required beyond the Society's School at Bloomsbury Square and the "grinders." Supposing the Council to *establish* three or four schools of pharmacy in the provinces, it was evident that it could not exercise a proper control and management over them. If they were the property of the Society, its Council could not delegate to any other body or bodies their control. It was clear that local schools must be under local management, and the plan of grants in aid of local efforts seemed to guarantee success, as far as this was possible, for it fused into one the powers of "the men" and "the money." Mutual co-operation at the present period of transition would be likely to solve one of our first wants in connection with the subject, viz. the supply of suitable teachers for schools of pharmacy. With the guarantee which could be given by organization, qualified persons would venture upon the new field, and gradually take their places as essential members of our national system of pharmacy. When this was once done, they might rely with as much certainty upon the ordinary laws of supply and demand as does a great city in the vital question of its food supply.

During the discussion which followed, Mr. Abbott stated that an attempt had been made to get up a botany class in connection with another institution in the town; only three persons joined the class, and, in consequence, it was given up.

Mr. J. Clapham would prefer that an attempt be made to have classes in connection with their own Society during the day, and would be glad to contribute £10 towards the expenses. Before asking the Pharmaceutical Council to assist them, they should show that they were really in earnest.

Mr. J. N. Horsfield was in favour of increasing the facilities for students.

Mr. P. Jefferson thought that if a young man was disposed to learn, he would make progress with very little assistance beyond good and proper books; and suggested that aid might be given to students by making some allowance from the published prices of the books required.

The Honorary Secretary reminded the meeting that a botany class had been held two years ago between 7 and 8 o'clock in the morning, for which upwards of twenty tickets were taken, and the attendance was very satisfactory; a similar course might be tried during the summer. The Committee had frequently had the question of providing the classes during the day brought before them, in order to afford opportunities for young men in the neighbouring towns and villages to come and attend these classes. The difficulty of obtaining a teacher at such times had not yet been overcome. He proposed the following resolution:—

"That whilst the Pharmaceutical Society may give valuable *aid* and encouragement towards provincial pharmaceutical education, this meeting considers the powers of the present amended conditions for making grants and loans should be enlarged."

Mr. Abbott seconded the resolution.

The President was glad that the subject had been so well ventilated, and quite coincided with the words of the resolution. It was certainly not the province of the Council to *establish* schools of pharmacy in the provinces, but they could properly *aid* such societies as these which had been established for educational purposes.

The resolution was carried unanimously.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

Thursday, 7th March, 1872; Prof. Williamson, F.R.S., Vice-President, in the chair. In the course of the ordinary business of the Society, the proposed changes in the officers and council of the Society for the ensuing year were announced. Dr. Debus F.R.S., then read a paper "On the Reduction of Ethylic Oxalate by Sodium Amalgam." In 1864 Dr. Friedlander described, as the result of this reaction, the production of the sodium salt of a new acid which he named glycolinic acid. Although the author has carefully repeated Dr. Friedlander's experiments and varied the details of the process in different ways, he has been unable to obtain glycolinic acid, the only acids formed being glycollic and tartaric. A comparison of the crystalline form of a specimen of sodium glycolinate prepared by Friedlander with that of sodium glycollate, would seem to indicate that it is identical with the latter. Two other papers were also read, one "On Metastannic Acid and the Detection and Estimation of Tin," by A. H. Allen, F.C.S.; and the other, "Note on the Quantity of Cæsium contained in the water of the Hot Springs found at Wheal Clifford," by Col. Philip Yorke, F.R.S., from which it appears that a gallon of this water contains 26 grs. of lithium chloride and one million parts 1·7 of cæsium chloride, or more than ten times as much of the latter as the Dürkheim water, in which it will be remembered that element was first detected by Kirchoff and Bunsen in 1860.

ÉCOLE SUPÉRIEURE DE PHARMACIE DE PARIS.

At the inaugural meeting of this institution for the session commencing the 15th of November last, under the presidency of M. Bussy, the following *éloge* of the late Professor Guibourt was delivered by M. Buignet, Professor of Physics and General Secretary to the Paris Society of Pharmacy:—

Nicolas-Jean-Baptiste-Gaston Guibourt.

Among the men who have contributed to the progress of pharmaceutical science, there has not been one who laboured with more ardour, or who has left behind him more lively regrets, than the eminent man whose history it is now proposed to trace. At various times pharmacien, professor at the École Supérieure de Pharmacie at

Paris, member of the Académie de Médecine, member and twice president of the Société de Pharmacie, M. Guibourt appears as an unassuming scholar, who, undazzled by the glitter of fame, and devoted entirely to well-doing and the cultivation of science, was not diverted from his object by any extraneous cares; whose zeal never needed praise as an incentive, and whose greatest pleasure was to make a useful observation or to discover a fresh truth.

Nicolas-Jean-Baptiste-Gaston Guibourt was born in Paris, July 2, 1790. He was educated under the direction of his father, and showed from his infancy that sweetness of disposition and aptitude for work which were always the principal traits of his character. When, his "humanities" finished, it became necessary that he should select a profession, his choice fell without hesitation upon pharmacy as agreeing with his taste for study. He had the good fortune to be admitted as an apprentice into the establishment of M. Boudet, who was justly esteemed to be one of the most distinguished pharmaciens then in Paris. Under this able teacher he learned the art of manipulating and compounding mixtures, and preparing medicaments; details of knowledge without which men, otherwise able, sometimes find themselves deprived of valuable resources; details, perhaps, a little too much neglected in the present day, when young pharmacists, given up to the grand theories of science, scarcely deign to think of the processes of practical pharmacy.

The talent that was one day to make M. Guibourt famous did not escape the sagacity of M. Boudet. Encouraged by that gentleman's wise counsels, the young scholar prolonged his studies, and hence his entrance into active life was marked by brilliant success. Appointed successively *interne* at the Hôtel Dieu, director of the *annexe* to the Pitié, assistant-director of the central pharmacy of the civil hospitals and superintendent of the stores in the same establishment, he found himself surrounded by the pharmaceutical riches which first suggested to him the idea of his 'History of Drugs.' In 1810, when scarcely twenty years of age, he bore off the first prizes for chemistry and pharmacy at the École de Paris, receiving them amongst public plaudits of which he was already worthy, and which he then heard for the first time.

When in 1816 M. Guibourt had to take the necessary steps for the exercise of pharmacy, he thought it to be due to his antecedents and to himself, to mark his reception by an inaugural thesis. The post that he occupied at the central pharmacy had enabled him to prepare all the galenical and chemical medicaments destined for the supply of the hospitals. Therefore he was not embarrassed to find a subject for his thesis, and he chose a "Study of the Combinations of Mercury with Oxygen and with Sulphur." He had been struck by the appearance and want of stability of some of these combinations, and to dissipate all doubts as to their true nature, he instituted a numerous and varied series of experiments.

Success in the physical sciences results not only from the zeal of the student, but principally from an ability to utilize experimental method in the discovery of truth. It was such a method that M. Guibourt employed with the happiest results in this memoir, and that he always practised in his later ones. His thesis was remarkable equally for the number of experiments recorded, and the important lessons deduced from them.

Scarcely in possession of his title, he hastened to open a pharmacy; here, however, he sought not to dazzle the public by a brilliant outside. Situated at the bottom of a court in the Rue Feydeau, his pharmacy would scarcely have attracted any but those who knew the personal value of the proprietor. But his desire was less to attain a fortune than to satisfy his taste for science. So, while not neglecting any of the cares demanded by a first-rate establishment, he pursued his studies in all the branches of pharmaceutical science. This he did with so much ardour, and his researches became so multiplied, that it would be quite impossible to furnish a complete list of them. Scattered through different works and scientific journals, all his memoirs, varied as the subjects are of which they treat, have one common characteristic, that of tending to the perfection of the art, and to raise the scientific standing of the pharmacist.

In attempting to divide into classes the numerous productions of M. Guibourt, it is found that he turned his attention successively to chemistry, physics, toxicology, materia medica and pharmacy. Those which relate to pure chemistry embrace mineral chemistry, organic chemistry and animal chemistry.

Quickly following his inaugural thesis, M. Guibourt published some important remarks upon the carbonate of potash obtained by deflagrating nitrate of potash with acid tartrate of potash, showing that a slight change in the conditions of temperature led to a considerable difference in the nature of the product obtained. The formation of cyanide of potassium in quantities proportionate to an increase of temperature illustrated the necessity that exists for carefully carrying out even the smallest details of pharmaceutical processes.

A little later M. Guibourt published some interesting papers on "Arsenic and its Compounds," "The Water of Crystallization of the Salts of Soda," and "The Purification of Nitrate of Silver." He showed that the sulphides of arsenic, prepared artificially, contained occasionally as much as 96 per cent. of arsenious acid; and that crystals of sulphate and carbonate of soda, exposed in a dry atmosphere, parted with the elements of water in very different proportions, the first becoming completely anhydrous, whilst the second retained about 30 per cent. of the water it originally contained. He also gave a simple process by which the last traces of copper might easily be removed from nitrate of silver. In some researches upon iodine in the urine, he indicated the combinations that some minerals form with organic liquids, the altered aspect that they assume, and the necessity for destroying the organic matter itself, in order to make their reactions manifest.

The investigation of the "Saccharine Matter in Honey" made in 1821, at a time when our knowledge of the sugars was comparatively slight, not only confirmed the views of Proust upon the nature of this substance and its difference from cane sugar, but showed also the extensive variations it might itself present, according to the nature of the vegetation growing in the country inhabited by the bees.

An examination, in 1843, of the process indicated by M. Pelouze, for the preparation of tannin, led M. Guibourt to the opinion that pure ether alone is not a good solvent of this substance, and that the employment of aqueous ether is indispensable to the success of the operation. He was also enabled to demonstrate by operating under conditions more favourable to success that the proportion of tannin contained in gall nuts was much larger than had been hitherto stated.

All these investigations, conscientiously made and clearly described, disclosed an eminently observant mind occupying itself, first of all, with the practical interest of the subjects dealt with. The same characteristic was observable in the patient and minute study which M. Guibourt made when entrusted to make a report upon the subject of "Pepsine." The remarkable properties of this substance had long been known; but the diversity in the modes of preparation resulted in such variable products that medical men could not rely on the efficacy of its action. He therefore compared all the processes previously described, and taking advantage of the best points of each, he combined them in a single process which he submitted to the test of experiment. The necessity for standardizing the officinal pepsine, the employment of fibrin to determine its value, the influence of certain acids in modifying or increasing its effects, the use of starch to form a neutral or acid amylaceous pepsine,—these are some of the points vigorously handled by M. Guibourt, and of which he sought the solution by experiment. The Codex of 1866 adopted the results of this important report.

Although M. Guibourt did not occupy himself with pure physics, in many of his works applications of that science are to be found. Among these may be mentioned a memoir upon the "Density of Volatile Oils," "The Optical Properties of the Turpentines and their Essences," some observations made in conjunction with M. Bouchardat, showing that the rotary powers of volatile oils are often very unstable and modified by simple distillation; "The Density of Porous Bodies," and the errors to which its determination is liable; and a memoir on "Tabaschir," in which he reviewed the physical characters of that singular concretion,—its increase in volume in contact with water, the transparency it acquires, and the feebleness of its index of refraction compared to its great density, of which he gave a just explanation.

More than once he was employed in researches relative to toxicology, and in 1829, being appointed with MM. Henry and Davis, to report on a case of presumed poisoning, he was able to demonstrate the presence of arsenious acid—the suspected poison—and also of sulphate of baryta, with which it had been adulterated by the vendor. Later he published some observations upon "Hydrate of Peroxide of Iron as an Antidote to Arsenic," the practical importance of which has diminished since the advantages of calcined magnesia have been pointed out by M. Bussy. In 1830, he verified a fact already noticed, but upon which doubts had been thrown, that the arsenic contained in commercial bismuth contaminated the subnitrate obtained by precipitation, and communicated to it toxic properties.

Materia medica, or the natural history of medicaments, was from the commencement of his scientific career the special study to which M. Guibourt devoted himself; it is also that to which the most numerous and most important of his memoirs belong. Struck with the vagueness that reigned everywhere in the descriptions of some of the most commonly used medicines, he gave himself up to most minute and patient investigations with a view to define more exactly the knowledge as to their origin, properties, and distinctive characters. He was thus enabled to correct many errors, to prove the identity of some substances previously thought to be distinct, and also to establish a well-marked distinction between substances hitherto regarded as identical.

In the numerous papers that he published upon opium, cinchona, scammony, jalap and rhubarb, he sought principally to describe the characters of the commercial kinds, and to enable the pharmaceutist to recognize products of good quality. In these memoirs, as in all he published, he always combined the knowledge of the chemist with that of the naturalist. Devoted as M. Guibourt was to chemistry, to which he had consecrated his early studies and the progress of which he watched with lively interest, it was not without inquietude that he saw the tendency to replace the original substances by the principles separated from them by chemical processes. In his opinion morphine and quinine represented but one portion of the effects of opium and cinchona; this opinion, long since expressed, has since been confirmed by the separation of fresh alkaloids possessing special and distinct properties.

The relations which M. Guibourt maintained with men of science in other countries caused him to receive specimens of materia medica from all parts of the globe. He was thus enabled not only to verify the characters of a great number of known substances, but also to indicate a multitude of new products, such as woods, barks and roots, by which the French materia medica might be enriched.

It is not possible to enumerate all the substances which were thus successively the object of M. Guibourt's researches, but a few may be mentioned to show their variety. "A Botanical, Chemical and Medical History of Bebeeru and the Febrifuge Alkaloid that it contains;" "Researches upon the Long Disputed Origin of the Ergot of Rye," in which he showed its true nature, as since verified by the observations of M. Tulasne: an examination of a great number of aromatic roots and seeds of Scitaminaceous plants; a description of the physical and chemical characters by which *Canella alba* and Winter's bark (*Drimys Winteri*) might be distinguished; the comparative value of black and grey cochineal; observations upon musk and castoreum, various kinds of balsams and turpentines, catechu, gambir, gum kino, and many other substances. Besides these numerous labours of his own, he was always eager to bring before his countrymen those of foreign workers, such as the memoirs of Hanbury, Pereira, Christison and Graham, generally increasing the value of the information by additional notes.

M. Guibourt's publications in pharmacy proper were very numerous and of great practical interest. They were all characterized by the scrupulous exactitude of the experiments and the logical deductions drawn from them. Some had for their object to make known fresh processes for the preparation of certain medicaments, such as the syrups of sarsaparilla and ipecacuanha, mercurial ointment, croton oil, ethiops mineral, etc. Others had for their object to describe new preparations, such as "An Epispastic Ointment without Cantharides," or spurge ointment, which he was the first to indicate. In other cases he investigated the alterations that took place with the lapse of time in such substances as cantharides, jalap and tincture of iodine; also the adulterations practised in senna, saffron, essence of roses, balsam of copaiba, and iodide of potassium.

The chemical analysis of the original substances occupied much of M. Guibourt's attention. Although in principle he placed more confidence in the examination of exterior characters than in the results of analyses, always more or less imperfect, he was far from despising their utility. This may be seen by the researches resulting in a memoir on "The Estimation of Morphia in Opium," giving the results of the examination of more than forty specimens from various sources, from which a standard mean for normal opium was taken and adopted in the Codex of 1866; his analytical investigations as to the cinchonine in commercial sulphate of quinine, and those published in conjunction with M. Bussy as to the presence of quinidine in the same salt.

Independently of the preceding, which imperfectly represent the original memoirs of M. Guibourt, he produced many others in the capacity of reporter to various learned societies to which he belonged.

M. Guibourt became a member of the Société de Pharmacie in 1818. In 1823 he was elected a member of the Académie de Médecine, an honour which he much esteemed. Although still young, he had already published upwards of twenty-four memoirs upon various pharmaceutical subjects, and might have looked upon it as a recompense for services rendered; but he preferred to regard it as an encouragement for those he could yet perform. He attended the sittings assiduously, and always appeared ready for work, accepting commissions involving the most laborious details, and presenting to all an example of most laudable emulation.

More simple and more practical in their character, the sittings of the Société de Pharmacie were to M. Guibourt a fresh source of pleasure. He was there, as it were, at home, surrounded by colleagues who showed to him that regard and deference which the authority of his age and experience so well merited. Strongly attached to the Society, he always desired that the results of his investigations might be first announced at its sittings. Another motive is mentioned in one of his memoirs, that, tried by passing through the crucible of discussion, his work might go forth to the world with better chance of success: a motive as honourable to the author's modesty as to the Society which inspired it.

Two works have established solidly the reputation of M. Guibourt, the 'Pharmacopée Raisonnée' and the 'Histoire Naturelle des Drogues Simples.' The first of these was produced in 1828 with the assistance of M. Henry; but two subsequent editions were published in 1834 and 1841 by M. Guibourt alone. Its publication was a veritable service rendered to pharmaceutical science. The skilful manner in which the various subjects are treated, the judicious selection of formulæ, the precision of the ideas, and the adroit manner in which principles are connected with consequences, give to it all the characters of a truly scientific work and realize a real progress. In the practical portion the care with which the descriptions are given shows that the authors have themselves studied and performed the operations to which they refer.

The 'Histoire Naturelle des Drogues,' the first edition of which appeared in 1820, has been as favourable to the development of materia medica as the 'Pharmacopée Raisonnée' of pharmacy. The valuable information that the author had collected upon the origin, nature and properties of drugs contributed powerfully to the success of the work, which was received with great favour. Nothing has been neglected to make it worthy of such a reception. M. Guibourt made scrupulously all the corrections that time and the progress of science rendered necessary, and, thanks to the improvements introduced into successive editions, the work is to-day the most exact and complete that exists in France upon the subject. It forms, as it were, a necessary complement to the 'Pharmacopée Raisonnée,' and is worthy of similar praise to that bestowed on that work. Those whom inclination or the direction of their studies lead to the study of the natural sciences may read with profit this work, written by a master hand. They will find in it authentic details concerning the origin of the crude substances, a rigorous and faithful description of their characters, and an entire good faith in the narration of the observations upon which opinions are founded. The fifth edition of this work was published in 1851. M. Guibourt had collected numerous materials for a new edition, but the preparation of it was interrupted by his death. M. Planchon, however, carried out the intentions of the deceased in a highly creditable manner.

The success which attended his numerous publications on materia medica necessarily drew attention to M. Guibourt's qualifications as a teacher, and in 1832 he was named Professor of Materia Medica at the École Supérieure de Pharmacie in Paris. Although so well fitted to perform the duties, he was at first much embarrassed by the very wealth of materials in his possession and the necessity for arranging them in a methodical and clear manner suitable for presentation to the students. This difficulty, however, with his characteristic energy, he soon overcame. His lectures were distinguished by the variety and solidity of the information they contained; the language in which it was conveyed was simple, without affectation of elegance. Solely occupied in advancing his scholars, he sought less to amuse than to instruct. Nothing that could distract was allowed to mix with the lesson, and nothing was ever brought forward but that which could and ought to be learned. Equally versed in natural history and in chemistry, he brought forward in all his lectures a number of facts relating to both sciences, and the interest of the descriptions was completed by chemical analyses of which each substance had been the subject.

In 1844 M. Guibourt was appointed Secretary to the same institution. His new duties being added to those belonging to his professorship, he decided to give up the practice of pharmacy and reside at the school, where he continued until 1865. In spite of his numerous occupations he still continued his observations and researches in the laboratory, and to him the museum of materia medica belonging to the establishment owes a great part of its organization.

Labours so multiplied and so useful had acquired for M. Guibourt a great celebrity. Named Chevalier of the Legion of Honour in 1846, he was promoted to the grade of officer in 1863. Nearly all the learned societies of Europe and America elected him to their Fellowship. He was named a member successively of the Académie des Sciences, the Society of Literature and Art at Rouen, the Pharmaceutical Societies of Great Britain, Norway, Saint Petersburg and South Germany, the Austrian General Association, the Physico-Medical Society of Erlangen, etc. He possessed in the highest degree sweetness of disposition and sagacity of mind. These two qualities, which were of great assistance to him in the practice of pharmacy, gained for him general confidence, and his talents were recognized equally by the pharmacologists of all countries.

In 1863, he lost his wife by death, and, in 1865, feeling his powers diminish, he left the institution with which he had been connected more than thirty-three years, to seek the rest he had so well earned. In the modest establishment to which he retired, he had a collection of materia medica, comprised of very rare specimens. As a last service to science, he wished to arrange this collection in such a manner that each substance might be accompanied by such information as would render its nature and origin quite clear. It was while engaged in this work that an event occurred that diverted his activity into another direction.

For some years considerable agitation had existed among the pharmacists on the Continent. The various societies that had been formed for promoting the art of pharmacy, seeing with pain the abuses of all kinds existing in its practice, resolved to make a joint attempt for the accomplishment of some of the necessary reforms. The first congress was held at Brunswick in 1865, and M. Guibourt and M. Robinet were commissioned to represent the Paris Society there. M. Guibourt also attended the second congress, which was held in Paris in 1867. The ardour with which he fulfilled the duties of his position in this new congress brought on a state of extreme fatigue, against which he with great difficulty struggled. He was nevertheless able, until the 21st of August, to acquit himself successfully of the difficult task he had undertaken. On that day he was seized with violent pains, and he died rather suddenly on the 22nd August, from an old complaint which had become complicated with acute heart disease.

M. Guibourt is worthy of being held up as an example to the followers of those sciences which he lovingly cultivated until his last hours. He had not received from Heaven those rare endowments that are the source of genius; but he was gifted with peculiar qualifications, which were developed and rendered fruitful by labour. In giving himself up to conscientious work, he did not seek to make a vain reputation; he demanded nothing; but he obtained that which must have been gratifying,—regard, deference, esteem, friendship.

The services which M. Guibourt rendered to chemistry and materia medica are already consecrated in the history of the sciences, where he has marked his place by the number and exactitude of his researches. But it belonged to the Paris Société de Pharmacie to render public homage to the indefatigable observer, the conscientious worker, the devoted professor who has deserved so well from the profession. Genius seldom wants for praise, but frequently a quiet, unostentatious life, devoted entirely to the search for truth, is forgotten. It is, therefore, the performance of a duty, and an act of justice, to indicate to the scientific world the services rendered by unassuming men like M. Guibourt. This is done the more willingly, since their eulogy, necessarily as simple as themselves, to be made worthily and to be heard with indulgence, requires but an upright mind and auditors sensible to the merits of duty accomplished.

Parliamentary and Law Proceedings.

ABSTRACT OF A BILL TO AMEND THE LAW RELATING TO PUBLIC HEALTH.

(*Prepared and brought in by Mr. Stansfeld, Mr. Secretary Bruce and Mr. Hibbert.*)

The provisions of this Bill are not to apply to Scotland or Ireland. England is to be divided into sanitary districts,—urban and rural,—respectively subject to the jurisdiction of local authorities empowered to exercise authority in all the matters affecting public health, which have hitherto been dealt with by various local boards. Every such urban authority is to appoint a medical officer, and every such rural authority is to appoint one or more medical officers and inspectors of nuisances. The Bill also provides for the suppression of nuisances affecting the purity of streams, and gives sanitary authorities power to take proceedings in respect to their pollution. It imposes the duty of providing for proper cleansing of streets, removal of house refuse, etc., under a maximum penalty of ten shillings a day on conviction of default in the case of any inmate or occupier of a house who has given written notice to the sanitary authority for the execution of each duty. The provisions of the Nuisances Removal Act are to extend to unwholesome milk and tea. Sellers of food proved to be diseased, unsound or unwholesome are, on conviction, to be liable to a maximum penalty of twenty pounds, and warrants may be obtained to search for such food on complaint by a medical officer of health.

Clause 47 provides that "the penalty imposed in respect of the adulteration of food or drink by the first section of the Food Adulteration Act shall be a sum not exceeding *twenty pounds*, instead of a sum not exceeding five pounds; and the said section shall be amended by substituting the words 'a penalty not exceeding *twenty pounds*' for the words 'a penalty not exceeding five pounds.'"

Powers are also given to the sanitary authorities to close foul wells and to prohibit the occupation of buildings unfit for human habitation, to take steps for abatement of nuisances, to deal with water supply by purchasing water, carrying water mains without their districts and otherwise; and in regard to this subject—

Clause 53 provides that "the water supplied in and to every sanitary district or any part thereof for drinking or domestic purposes, whether by the sanitary authority itself or by any waterworks company or person, shall be effectually filtered when necessary, and shall be free from any impurities rendering it unwholesome, or injurious, or dangerous to health.

"If at any time the water supplied by any sanitary authority, company, or person, for drinking or domestic purposes, is as to purity not in accordance with the conditions prescribed by this section, such sanitary authority, company, or person shall in every such case be liable to a penalty not exceeding *fifty pounds* unless the sanitary authority, company, or person can prove that such defect in purity could not have been guarded against by such sanitary authority, company or person: Provided always, that nothing in this section contained shall relieve the sanitary authority, company, or person from liability to any other proceedings under this or any other Act of Parliament or at common law: Provided also that it shall be the duty of every sanitary authority to enforce the provisions of this section against any company or person supplying water within its district."

Urban sanitary authorities are to have power to light their districts with gas under certain conditions.

Sanitary authorities are to be under the obligation of providing "a proper place or places furnished with proper apparatus and service for disinfection of clothes and other articles, with a proper carriage or carriages for the conveyance of infected persons, and with sufficient hospital accommodation for persons affected by dangerous infectious, contagious, or epidemic diseases, together with medical assistance, medicines, attendance, and all other requisites for the maintenance, cure, and comfort of patients in hospitals; and such sanitary authority shall have power to direct the destruction of any bedding, clothing, or other articles which have been exposed to infection from any dangerous infectious disorder, and to give compensation for the same."

They may, where expedient, also direct the fitting up and furnishing of dispensaries, the provision of proper medicines, appliances and requisites for the medical and surgical treatment of the sick poor relieved out of the workhouses of unions, the supply of medicines during epidemics, and otherwise act with hospital authorities and guardians as to the arrangements of hospitals.

"Every urban sanitary authority shall, if required by the Local Government Board, provide within its district a proper place for the reception of dead bodies."

Returns of sickness may also be obtained by the sanitary authority, and it is to be the duty of the medical officers to make such returns.

Clauses 62 to 64 deal with the subject of analysts as follows:—

"62. Every sanitary authority shall cause the water supplied for drinking or domestic purposes within its district, whether by itself or by any waterworks company or by any person, to be analysed at such times as the Local Government Board may direct.

"For the purpose of obtaining samples of the water so supplied, any analyst or duly authorized officer of the sanitary authority may enter upon any lands occupied by such waterworks company or person so supplying water, and may take and carry away samples of the water so supplied, and any person refusing admission to or obstructing any such analyst or duly authorized officer as aforesaid in the performance of his duties under this section shall, in addition to any other punishment to which he may be subject, be liable to a penalty not exceeding forty shillings.

"63. It shall be the duty of every sanitary authority to cause to be analysed, in conformity with any directions issued by the Local Government Board, any sewage matter, or filthy or noxious water or washings of manufactories, or other polluting liquid falling or flowing into any stream within its district.

"64. Any analysis required or authorized by this Act, or by the Food Adulteration Act, may be made by an analyst appointed in pursuance of the Food Adulteration Act, or with the consent of the Local Government Board by an officer of that Board.

"The Local Government Board may make regulations under which purchasers of any article of food or drink may apply to the Local Government Board to have such analysis as is provided for in the Food Adulteration Act conducted by an officer of that Board.

"There shall be paid to the Local Government Board, for each analysis made by an officer of the Local Government Board, such fee by the authority or person requiring the analysis as the Local Government Board may determine."

The remaining clauses of the Act refer to miscellaneous details concerning the election of local boards, the settlement of differences, default of sanitary authority in performance of duty, compulsory powers, the raising of money on the rates, legal proceedings, saving clauses and definitions of terms, etc.

BILL FOR CONSOLIDATING AND AMENDING ALL THE LAWS ON PUBLIC HEALTH AND LOCAL GOVERNMENT FOR ENGLAND AND WALES, EXCLUSIVE OF THE METROPOLIS.

This Bill, which is brought in by Sir Charles Adderley, Mr. Russell Gurney, Mr. Whitbread, Mr. Stephen Cave, Lord Robert Montagu, Mr. Richards and Mr. Powell, is much more comprehensive in its details. The powers and obligations prescribed in it are proposed to be vested in the "local authority," or the persons authorized to carry out the act in each district, and the "central authority," or the Local Government Board, as constituted by the Local Government Board Act, 1871.

Clause 57 obliges the local authorities to appoint such officers as are necessary and proper for the efficient execution of the Act, and to make bye-laws regulating their duties. These officers are to be removable by the local authority, subject in the case of surveyor or local inspector to the approval of the central authority.

Clause 58 prescribes that the local authority shall appoint one or more qualified medical practitioners as medical officers of health, whose appointments, removal and remuneration are to be subject to the approval of the central authority.

Clause 59 permits the appointment of poor-law district medical officers to this office, and clause 60 enacts that it shall be the duty of medical officers of health and local inspectors to supply necessary information to the local authority, and to furnish such reports as the central authority may from time to time call for. Medical officers of health are also empowered at their discretion, to exercise the powers of local inspectors.

Clauses 119 to 126 refer to the quality of the water supply as follows:—

119. The water supplied in every district, whether by the local authority itself or by any waterworks company, shall be effectually filtered, according to the best-known mode of filtration to be from time to time appointed to be used by the central authority, and shall, as to purity, be in accordance with the conditions in the schedule (C.)* to this Act annexed, or with such other conditions as may from time to time be approved by the central authority.

120. There shall be one or more water analysts, being competent and impartial persons, from time to time appointed by and removable by the central authority.

There shall be paid to each such water analyst such remuneration by each local authority and company supplying the water, as the central authority shall determine.

The water analyst shall, when and as he shall be required by the central authority, but not less often than once in each *month*, analyse the quality of water supplied by each local authority and company, and in the event of the same being ascertained to be defective in any particular, he shall forthwith give notice thereof to the local authority or company supplying the same.

121. Any local authority or company may, if they think fit, on each occasion of the analysis of water supplied by them, be represented by some officer, but such officer shall not interfere in the making of such analysis.

122. Each water analyst shall on each occasion of his making such analyses forthwith make and deliver a report of the result of the analysis so made by him to the central authority, and to each local authority or water company to which the same relate; and the books kept by a water analyst for recording the results of the analyses by him shall be open at all reasonable times to the inspection of any local authority or company without payment.

123. Each local authority or water company shall forthwith make and deliver a full and true copy of each such report to the local authority of every district within which they supply water.

124. Every local authority within whose district water is supplied either by themselves or by any other local authority, or by any water company, shall provide and keep at their office proper books to be approved by the central authority, for recording the results of such analyses, and every such report shall forthwith be duly entered therein, and such books shall be open to the inspection of any ratepayer or water consumer at all reasonable times without payment.

125. The statements in any report of the water analyst as to the amount and kind of the impurity of the water supplied by any local authority or company shall be taken as *primâ facie* evidence of such impurity on the day when such analysis was made.

126. If during ——— the water supplied by any local authority or company is as to purity not in accordance with the conditions for the time being in force under this Act, such local authority or company shall in every such case be liable to a penalty not exceeding *fifty pounds*, unless the company can prove that such defect in purity was caused by unavoidable accident: Provided always, that nothing in this section contained shall relieve the local authority from liability to any other proceedings under this or any other Act of Parliament.

* This schedule is, at present, a blank.—Ed. Ph. Journ.

THE SALE OF POISONS IN NEW ZEALAND.

The following "Act to make further and better provision for regulating the Sale and Keeping of certain Poisons" has passed the New Zealand Legislature:—

Whereas it is expedient for the safety of the public that further and better provision should be made for regulating the sale of poisons, and that persons keeping open shop for the retailing, dispensing, or compounding of poisons should be registered in the manner herein provided:

Be it enacted by the General Assembly of New Zealand in Parliament assembled, and by the authority of the same as follows:—

1. The short title of this Act shall be "The Sale of Poisons Act, 1871."

2. "The Sale of Poisons Act, 1866,"* shall from and after the thirty-first day of December, one thousand eight hundred and seventy-one, be repealed, but this repeal shall not interfere with the institution or prosecution of any proceeding in respect of any offence committed against, or any penalty incurred under the said Act, but the same may be instituted and prosecuted as if this Act had not been passed.

3. The several articles named or described in the first schedule hereto shall be deemed to be poisons within the meaning of this Act, and the Governor by order in Council may from time to time declare that any article in such order named shall be deemed a poison within the meaning of this Act, and such order shall be advertised in the *New Zealand Gazette*, and on the expiration of three months from such advertisement, the article named in such resolution shall be deemed to be a poison within the meaning of this Act.

4. From and after the thirty-first day of December, one thousand eight hundred and seventy-one, it shall be unlawful for any person to sell or keep open shop for retailing, dispensing, or compounding poisons in any part of New Zealand, unless such person shall be registered under this Act in the register kept under this Act for the province or other division in which he so sells or keeps open shop, and conform to such regulations, as to the keeping, dispensing, and selling of such poisons as may from time to time be prescribed by the Governor in Council, which regulations the Governor in Council is hereby authorized from time to time to make, and to vary or rescind as may seem expedient.

5. The Governor may from time to time by warrant under his hand, appoint for each province or other division of the colony, a person to be registrar under this Act, and may at any time remove any person so appointed, and appoint another in his place. Each registrar shall have an office at such town or place as the governor may from time to time direct, and at such office he shall keep the register for the province or other division for which he is appointed.

* We have been unable up to the present time to ascertain the character of this Act.—Ed. Pharm. Journ.

6. Any person who wishes to sell or keep open shop for retailing, dispensing or compounding poisons in any province or other division of the colony for which a registrar has been appointed under this Act, may be registered under this Act without fee or reward on application to the registrar personally or by registered letter.

7. The register to be kept under this Act for each province or other division shall be in accordance with the form set forth in the second schedule to this Act, and such register shall be called "The Register of Vendors of Poisons for the province of —— (*naming it*) [*or* for the —— of —— (*naming it*)]."

8. It shall be the duty of the registrar of each province or division to make and keep a correct register in accordance with the provisions of this Act of all persons required to be registered under this Act in the register for such province or other division on application without fee or reward, and to erase the names of all registered persons who shall have died or removed from the province or other division or ceased to carry on business, and from time to time to make the necessary alterations in the addresses of the persons registered under this Act.

To enable the registrar duly to fulfil the duties imposed upon him, it shall be lawful for the registrar to write a letter to any registered person, addressed to him according to his address on the register, to inquire whether he has ceased to carry on business or has changed his residence; such letter to be forwarded by post as a registered letter, according to the Post-Office regulations for the time being; and if no answer shall be returned to such letter within the period of six months from the sending of the letter, a second of similar purport shall be sent in like manner, and if no answer be given thereto within three months from the date thereof, it shall be lawful to erase the name of such person from the register. Provided always that the same may be restored by the registrar.

9. Every registrar of deaths in New Zealand, on receiving notice of the death of any person registered under this Act, shall forthwith transmit by post to the registrar under this Act for the province or other division in which such death took place, a certificate under his own hand of such death with the particulars of the time and place of death; and on the receipt of such certificate, the said registrar under this Act shall erase the name of such deceased person from the register, if such deceased person shall be registered in his register; if not, he shall send the certificate to the registrar in whose register such deceased person is registered, and on the receipt thereof the last-named registrar shall erase the name of the deceased person from the register.

10. The registrar for each province or other division shall, in the month of January in every year, cause to be printed, published and authorized to be sold, a correct register of all persons registered in his register, and in such register the names shall be in alphabetical order according to the surnames, with the respective residences, in the form set forth in the second schedule to this Act, or to the like effect, of all persons appearing on the register of vendors of poisons on the thirty-first day of December last preceding, and such printed registers shall be called "The Register of Vendors of Poisons for the Province of —— (*naming it*) [*or* for the —— —— of —— (*naming it*)]," as the case may be; and a printed copy of any such register for the time being purporting to be so printed and published as aforesaid, or any certificate under the hand of the said registrar, shall be evidence in all courts and before all justices of the peace and others that the persons therein specified are registered according to the provisions of this Act; and the absence of the name of any person from such printed register shall be evidence until the contrary shall be made to appear that such person is not registered according to the provisions of this Act.

11. From and after the thirty-first day of December, one thousand eight hundred and seventy-one, any person who shall sell or keep an open shop for the retailing, dispensing or compounding poisons, not being registered under this Act, or shall fail to conform with any regulation as to the keeping or selling of poisons made by the Governor in Council in pursuance of this Act, shall for every such offence be liable, on summary conviction before any two or more justices of the peace, to a penalty not exceeding five pounds.

12. It shall be unlawful to sell any poison unless the box, bottle, vessel, wrapper or cover in which such poison is contained be distinctly labelled with the name of the article and the word "poison," and with the name and address of the seller of the poison.

And it shall be unlawful to sell any poison of those which are specified in the first part of the first schedule to this Act, or may hereafter be declared to be poisons within the meaning of this Act by order in Council under the third section of this Act, to any person unknown to the seller, unless introduced by some person known to the seller, and on every sale of any such article the seller shall, before delivery, make or cause to be made an entry in a book to be kept for that purpose, stating in the form set forth in the third schedule to this Act the date of the sale, the name and address of the purchaser, the name and quantity of the article sold, and the purpose for which it is stated by the purchaser to be required, to which entry the signature of the purchaser, and of the person, if any, who introduced him, shall be affixed.

And any person selling poison otherwise than is herein provided shall, upon a summary conviction before two justices of the peace, be liable to a penalty not exceeding five pounds for the first offence, and to a penalty not exceeding ten pounds for the second, or any subsequent offence.

And for the purposes of this section the person on whose behalf any sale is made by any apprentice or servant shall be deemed to be the seller, but the provisions of this section, which are solely applicable to poisons in the first part of the first schedule to this Act, or which require that the label shall contain the name and address of the seller, shall not apply to articles to be exported from New Zealand by wholesale dealers, nor to sales by wholesale to retail dealers in the ordinary course of wholesale dealing, nor shall any of the provisions of this section apply to any medicine supplied by a legally-qualified medical practitioner to his patient, nor apply to any article when forming part of the ingredients of any medicine dispensed by a person registered under this Act: provided such medicine be labelled in the manner aforesaid with the name and address of the seller, and the ingredients thereof be entered with the name of the person to whom it is sold or delivered, in a book to be kept by the seller for that purpose, nor to the sale of arsenic by wholesale dealers in quantities not less than one hundredweight.

13. Every person registered under this Act and every seller of poison, shall produce to any police-officer, whenever requested to do so, the book required to be kept as aforesaid, and, if requested so to do, a copy of any entries made therein. For any act or default contrary to the provisions of this section done or made by any such registered person or any seller of poisons, he shall be liable to a penalty, on summary conviction, of not less than twenty shillings and not exceeding five pounds.

14. No person shall sell any arsenic unless the same be before the sale thereof mixed with soot or indigo, in the proportion of one ounce of soot or half an ounce of indigo at least to one pound of arsenic, and so in proportion for any greater or less quantity, on pain of forfeiture of a penalty not exceeding five pounds, to be recovered in a summary way: provided always that where such arsenic is stated by the purchaser to be required for some pur-

pose for which such admixture would, according to the representation of the purchaser, render it unfit, such arsenic may be sold without such admixture.

15. Persons registered under the "Medical Practitioners Registration Act, 1869," shall not be registered under this Act.

16. The provisions of the "Adulteration of Food Act, 1866," shall extend to all articles usually taken or sold as medicines.

SCHEDULES.

First Schedule.

PART I.

Arsenic and its preparations.
Prussic Acid.
Cyanides of Potassium and all metallic Cyanides.
Strychnine and all poisonous vegetable Alkaloids and their Salts.
Aconite and its preparations.
Emetic Tartar.
Corrosive Sublimate.
Cantharides.
Savin and its Oil.
Ergot of Rye and its preparations.
Laudanum.
Opium.

PART II.

Oxalic Acid.
Chloroform.
Belladonna and its preparations.
Essential Oil of Almonds (unless deprived of its Prussic Acid).
All preparations of Opium or of Poppies.
Preparations of Corrosive Sublimate.
Preparations of Morphine.
Red Oxide of Mercury (commonly known as Red Precipitate of Mercury).
Ammoniated Mercury (commonly known as White Precipitate of Mercury).
Every compound containing any of the poisons mentioned in this schedule when prepared or sold for the destruction of vermin.
The tincture and all vesicating liquid preparations of Cantharides.

Second Schedule.

Name.	Residence.
A. B.	Street.
C. D.	Street.

Third Schedule.

Date.	Name and Address of Purchaser.	Name and Quantity of Poison sold.	Purpose for which it is required.	Signature of Purchaser.	Signature of Person introducing Purchaser.

Double Infringement of the Pharmacy Act.

At the Ruthin petty sessions, on Monday, March 4th, Thomas William Jones, grocer, etc., Gyffliog, was summoned by Mr. Bancroft, county analyst and local secretary to the Pharmaceutical Society, for selling poison, to wit, a preparation of laudanum, without labelling such bottle with the word poison, and also attaching the name and address of the seller.

Mr. Louis, for the prosecution, stated that some time ago a list of persons selling poisons in country villages contrary to the law was furnished to the Society in London, and the whole of such persons had been cautioned against the practice. It was, however, continued, and the Society had thought it necessary to bring the present proceedings. He then pointed out to the Bench the section of the Act under which he was proceeding, after which he called the following witnesses:—

Police-constable George Hughes said he went to the defendant's shop, on the 8th of January, 1872, and saw a boy there. The defendant is a grocer, draper and general dealer. The boy was about fourteen years old, and there was no one else in the shop. He asked the boy for half an ounce of laudanum. The boy put the stuff in the bottle, and handed it to witness. The label on the bottle was "tincture of opia." The boy put no label on the small bottle he handed to him, nor any name upon it. Witness paid twopence for it. The boy, in handing him the bottle, asked him what it was for, and he said for a horse that was bad. The boy never asked him until he handed him the bottle what the laudanum was for.

A magistrate asked if laudanum was such a poison as was named in the Act.

Mr. Louis pointed out that the Act expressly stated any preparation of opium.

Mr. Bancroft said he was county analyst and local secretary to the Pharmaceutical Society. The police, some time ago, handed him a list of all the shopkeepers in the district who retailed poisons, and that list he forwarded to the Society in London. Since then notices had been served upon the shopkeepers, cautioning them against the practice. The bottle produced was handed to him in the same state as it now appeared by the last witness. He had analysed the contents, and found them to be a preparation of opium, and poison. The bottle was without label or address.

Police-constable John Hughes said he visited the defendant's shop on the 4th of February, 1871, saw him, and asked him if he sold laudanum, and he said no. Defendant wrote for witness the names of all the drugs he sold upon a piece of paper. He said that he never sold laudanum, and he did not include it in the list he wrote.

Mr. Louis said that they had to proceed against the defendant upon another charge, for keeping open his shop for the sale of poison contrary to law, he not being a duly qualified chemist and druggist.

Mr. Bancroft handed in a register of all the qualified chemists, in which the name of the defendant did not appear.

The defendant admitted that he was not registered and that he had sold laudanum.

After some discussion between the Bench and Mr. Louis, as to the necessity of proceeding with the second case, the evidence was taken, which was similar to that given in the previous case.

The Bench, after some consideration, inflicted a fine of 20*s*. and costs in the first case, and 6*d*. without costs in the second case.

Griffith Edwards, shopkeeper, was also summoned by Mr. Bancroft for selling, on the 8th day of January, a quantity of laudanum without affixing to the bottle a label stating that it was poison, or a label stating the name and address of the seller; he was also further charged with keeping his shop open for the sale of poisons contrary to the law, he not being a registered chemist according to the recent Act of Parliament. Defendant admitted that his wife had sold the poison, but said that he was not in the habit of selling poisons. He had taken the stock of the person who preceded him in business, and amongst it was a small quantity of laudanum, which was kept locked up in a cupboard in the house, and he would not have sold the quantity in question but a very respectable man came to ask for some for his horse, which was taken ill on the road.

The Bench asked him if he would plead guilty to having committed the offence, or have the witnesses called, and the defendant then pleaded guilty. He was fined 20*s*. and costs in the first case, and 6*d*., without costs, in the second case.

The Suicide by a "Vermin Killer."

An adjourned inquest was held at Oldham on Thursday to inquire respecting the death of Elizabeth Barrow, referred to previously on pp. 718 and 740.

Dr. A. T. Thomson, who had made a *post-mortem* examination of the body, described the appearance it presented, which he said was such as would result from poisoning by phosphorus. It was a peculiarity that in poisoning by phosphorus the symptoms did not manifest themselves until after a considerable period; in this case thirty hours elapsed. In answer to a question which he had put to the deceased as to why she had taken the vermin killer, she said merely to make herself ill to obtain sympathy.

The coroner briefly commented upon the evidence, and observed that it was quite apparent death was the result of taking vermin-destroying paste containing phosphorus, an article which he strongly urged ought to be added to the list of poisons scheduled in the Pharmacy Act. The chief point for the jury to consider would be the state of mind the deceased was in when she took the poison; there was nothing in the evidence to show she was in an unsound state of mind, and the medical evidence tended to show the act was wilful, but not intended to cause death. Taking that view of the case, it was a strong argument why phosphorus ought to be classified as a poison, as the deceased, if she only intended to create sympathy by making herself temporarily ill, could not be aware of the subtlety of the poison she had taken. A juror observed that a poison of such a dangerous character, to which there was no antidote, and which might be in the system for so many days without being found out, ought certainly to be only sold under restricted regulations.

The jury returned a verdict to the effect "that death was the result of poisoning with phosphorus, taken by the deceased with the intent of creating sympathy, but not for the purpose of poisoning herself."

A resolution was afterwards unanimously passed by the jury, which the coroner was requested to forward to the Secretary of the Pharmaceutical Society, recommending that vermin killers containing phosphorus should be included in the list of poisons, the sale of which is regulated by the Pharmacy Act.

BOOKS RECEIVED.

Dr. Pereira's Elements of Materia Medica and Therapeutics; abridged and adapted for the use of Medical and Pharmaceutical Practitioners and Students, and comprising all the Medicines of the British Pharmacopœia, with such others as are frequently ordered in Prescriptions or required by the Physicians. Edited by Robert Bentley, M.R.C.S., F.L.S., and Theophilus Redwood, Ph.D., F.C.S. London: Longmans, Green and Co. 1872.

The London Medical Guide, containing a Complete Directory of the Names, Addresses, Qualifications, Appointments, etc., of all Qualified Medical Practitioners residing in London and the Suburbs, together with other Information. London: Kelly and Co. 1872.

Lecture on Water, delivered before the American Institute of the City of New York. By C. F. Chandler, Ph.D. Albany: 1871.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Preliminary Examinations.

Sir,—In the Journal for last week, I find the following resolution was carried by the Board of Examiners of the Pharmaceutical Society:—

"That the Preliminary examinations be held in London and the Country at the same hour, simultaneously, and that twelve o'clock (noon) be the time fixed."

For my own part, I am perfectly willing to fall in with any arrangement which may be considered necessary for uniformity, but I do think the convenience of an unpaid body of gentlemen, giving their time and attention for the benefit of the Society, is entitled to consideration. The hour of twelve, noon, appears to me a most inconvenient time for the majority, and I confess I cannot see that any irregularity can arise from the local secretaries arranging the time most convenient to themselves, provided the examination takes place on the same day, and the papers are forwarded by the first post after the examination.

49, *Grand Parade, Brighton, March* 11*th*, 1872. James W. Gwatkin, *Local Sec. for Brighton.*

Poisoning by Salts of Sorrel.

Sir,—Yesterday morning a sad accident took place at Plainpalais. Mr. Gros, foreman to Mr. Busset, builder, being in the Chemin des Sources, wishing to take a purgative, had bought the night before a dose of Epsom salts (or as it is called here, English salts) at the shop of Mr. X, grocer, in the Route de Carouge. By an inconceivable error, salts of sorrel was sold to him instead of Epsom salts. Mr. Gros took the supposed purgative at 6 o'clock in the morning, and at half-past 7 he was dead.

R. T. Harland.

2, *Place des Bergues, Geneva*, 10*th March*.

"*Manipulator*."—The formula for the preparation of syr. ferri phosph. co. (Parrish's Chemical Food) will be found at p. 857 of the first volume of the present series of the Pharmaceutical Journal.

G. C. M.—According to the nature of the crystals required, they might be best obtained from chemical manufacturers or dealers in chemicals.

F. C. S.—Candidates for admission into the Chemical Society are proposed according to a form of recommendation, which may be obtained from the Secretaries. The recommendation must be signed by five Fellows, to three at least of whom the candidate must be personally known; and this certificate is read and suspended in the Society's rooms for three ordinary meetings before proceeding to the election by ballot.

"*A Registered Student of the Society*" and *M. P. S.* have not complied with the regulations respecting anonymous communications.

R. T. Harland.—The communication which you refer to as having been forwarded on the "25th ult.," has not yet arrived.

X. Y.—We would advise you to try the effect of strongly agitating the chloroform with the greater part of the water to be added to the mixture.

The following journals have been received:—The 'British Medical Journal,' Mar. 9; the 'Medical Times and Gazette,' Mar. 9; the 'Lancet,' Mar. 9; the 'Medical Press and Circular,' Mar. 13; 'Nature,' Mar. 9; the 'Chemical News,' Mar. 9; 'English Mechanic,' Mar. 8; 'Gardeners' Chronicle,' Mar. 9; the 'Grocer,' Mar. 9; the 'Journal of the Society of Arts,' Mar. 9; the 'Madras Monthly Journal of Medical Science' for February; the 'Leavenworth Medical Herald and Journal of Pharmacy' for February; the 'Practitioner' for March; the 'Doctor' for March; the 'Journal of the London Institution' for March.

Communications, Letters, etc., have been received from Professor Flückiger, Mr. M. C. Cooke, Mr. Bancroft, Mr. W. R. Fox, Mr. E. A. Webb, W. W., "Chemicus."

PEPSIN.

A NEW PRACTICAL AND RELIABLE METHOD TO PREPARE IT; ITS PROPERTIES AND DIGESTIVE STRENGTH.

BY E. SCHEFFER.

When publishing my paper upon saccharated pepsin (*American Journal of Pharmacy*, January, 1871)* my intention was to continue the experiments, then only hinted at, and to publish the results. I have since made a large number of experiments, some of which I deem of sufficient importance to be made known, although my researches are not finished.

The various methods for the preparation of pepsin, as given by different authors, seem to be intended mainly for the purpose of experiments, and are so complicated that the difference in the properties characterizing the products is readily accounted for. The student of physiology may not shun the trouble attending these processes, but the manufacturer could not possibly resort to them, even if he were so inclined.

The author of Leop. Gmelin's 'Handbook of Chemistry,' in the last volume of the work (issued in 1870) says, under the heading of pepsin:—"The pepsin of commerce is either mucus of the stomach, scraped off and dried, or a mixture of pepsin, peptons and starch, containing a little lactic acid." In what way these commercial pepsins were prepared it is difficult to say, as most manufacturers have their own way and keep it a secret; but in Europe, as well as in this country, most of these preparations died almost as soon as they were brought into existence, as they did not come up to what they were represented to be.

In the summer of 1870, while working on and experimenting with liquid pepsin (*American Journal of Pharmacy*, March, 1870), and at the same time trying to improve it, I discovered some tests which I considered useful in the preparation of dry pepsin. Before this I had wished to prepare pepsin in the dry state, but was not inclined to follow the tedious and in some way uncertain processes usually given.

Following up the hint received by certain tests with a number of experiments, I succeeded at last in obtaining a very satisfactory product.

The action of saturated solutions of some of the neutral salts of the alkalies on different protein substances induced me to try their effect on pepsin. For this purpose I prepared an extraction of the mucous membrane of fresh hogs' stomachs with water acidulated with muriatic acid, which after repeated filtrations formed an opalescent yellowish liquid. Equal volumes of this liquid and of a saturated solution of sulphate of soda, when well mixed together, formed a precipitate, which was collected on a filter, pressed and dried; a very small quantity of it, dissolved in water with the aid of a few drops of hydrochloric acid, dissolved coagulated albumen. Other saturated saline solutions were now experimented with, viz. of sulphate of magnesia and chloride of sodium, and also a solution of chloride of calcium of 1·27 sp. gr.

By these solutions precipitates were likewise found to form, possessing properties identical with that obtained by sulphate of soda, but I finally decided to employ chloride of sodium as the precipitant, as by a comparative test, which of the four different salts would produce the most precipitate, the proportion was: chloride of sodium 4, sulphate of magnesia 3½, sulphate of soda 2, chloride of calcium 1; so that chloride of sodium gave twice as much precipitate as sulphate of soda, and four times as much as chloride of calcium. But besides the larger yield, the sodium chloride has the preference for its antiseptic properties. A part of the precipitate, formed by sulphate of magnesia and allowed to remain in the liquid, had a putrid odour after the third day, while a moist precipitate, formed by chloride of sodium and set aside purposely for experiments, proved to be good after six months.

Preparation of Pepsin.—On this basis I now began to prepare pepsin. Of the well-cleaned fresh hog stomach the mucous membrane is dissected off, chopped finely and macerated in water acidulated with muriatic acid for several days, during which time the mass is frequently well stirred. The resulting liquid, after being strained, is, if not clear, set aside for at least twenty-four hours in order to allow the mucus to settle. To the clarified liquid the same bulk of a saturated solution of sodium chloride is added, and the whole thoroughly mixed. After several hours the pepsin, which by the addition of chloride of sodium has separated from its solution, is found floating on the surface, from whence it is removed with a spoon and put upon cotton cloth to drain; finally it is submitted to strong pressure, to free it as much as possible from the salt solution.

The pepsin, when taken from the press and allowed to become air dry, is a very tough substance, and presents, according to thickness, a different appearance, resembling in thin sheets parchment paper, and in thick layers sole leather; its colour varies from a dim straw yellow to a brownish yellow. Besides a little mucus, it contains small quantities of phosphate of lime and chloride of sodium, which, however, do not interfere with its digestive properties, as they are found also in normal gastric juice.

Saccharated Pepsin.—To work it into saccharated pepsin (*American Journal of Pharmacy*, January, 1871) the damp pepsin, as it is taken from the press, is triturated with a weighed quantity of sugar of milk to a fine powder, which, when it has become air dry, is weighed again, the quantity of milk sugar subtracted and so the amount of pepsin found. The strength of this dry pepsin is now acertained by finding how much coagulated albumen it will dissolve at a temperature of 100° F. in five or six hours, and after this sufficient milk sugar is added to result in a preparation of which ten grains will dissolve one hundred and twenty grains of coagulated albumen, and this preparation I have called saccharated pepsin.

Purification of Pepsin.—Anxious to get the pepsin in its purest state, if possible chemically pure, I tried different methods, but have not succeeded as yet. In order to get a purer article I redissolve the pepsin, as obtained after expression, in acidulated water, filter the solution through paper and precipitate again with a solution of sodium chloride; the precipitate, after draining and pressing, is now free of phosphate of lime and mucus, but still contains salt. In the freshly precipitated state the pepsin is very readily soluble in water, and cannot therefore be freed from adhering salt by washing.

By allowing the pressed sheet of pepsin to get perfectly air dry—whereby it becomes coated with a white film and small crystals of chloride of sodium —and by immersing it then in pure water for a short time, the greater part of sodium chloride can be

* PHARM. JOURN. 3rd Ser. Vol. I. p. 666.

extracted, but it has to be done very rapidly, as the pepsin swells up considerably and loses its tenacity. By operating in this manner I have obtained a pepsin which dissolves in acidulated water to quite a clear colourless liquid, but as it still contains traces of salt, I prefer to call it purified pepsin.

I obtained a pepsin quite free of chloride of sodium—which by combustion did not leave any ash—by swelling purified pepsin in water to a thick mucilaginous liquid, and mixing it with alcohol of 95 per cent. A gelatinous, almost transparent precipitate is formed, which is put on a cloth, washed with diluted alcohol, then pressed and dried. This preparation did not leave any ash by combustion; but I was greatly disappointed in my expectation, when I found that the digestive strength of this pure pepsin was not as great as that of the purified pepsin which still contained sodium chloride. No doubt the use of alcohol had impaired the digestive power of the pepsin to some extent.

Properties of Pepsin.—The pepsin is, as already mentioned, very soluble in water when recently precipitated, but when once air dry it dissolves but slowly and only in very small quantities in water.

The dry purified pepsin, when put into water, swells up considerably, becomes perfectly white and, when vigorously shaken, disintegrates to small floccules, which swim in the liquid and remain suspended for a long time, while a very small quantity will dissolve.

The watery solution has an almost neutral reaction, is coagulated by boiling, and gives with alcohol a transparent, gelatinous precipitate.

With sulphate of copper it remains clear at first, but after several hours becomes turbid.

Bichloride of mercury gives immediately a white precipitate.

With tannin a very copious white precipitate is obtained.

Nitrate of lead forms a white precipitate.

The precipitate formed by chloride of sodium is very characteristic and at the same time very interesting. When a saturated solution of chloride of sodium is added to a clear solution of pepsin, not too concentrated, at first a jelly-like transparent coagulation is formed, which disappears upon stirring, and the liquid acquires a slightly opalescent appearance; after a short time it becomes more turbid and small flakes are noticed floating in it, which soon will form into small transparent globules and as such rise to the surface. When the quantity of pepsin in a liquid is very small, the opalescence and turbidity is hardly noticed, but after some time the small globules will appear on the surface.

The watery solution of pepsin decomposes readily; after a few days small flakes separate from the clear solution, which increase in number by longer standing, and on the fourth day it emits a foul, disagreeable odour.

The watery solution of pepsin shows very little action on coagulated albumen: a certain quantity of albumen, which by a watery solution was hardly acted upon in twenty-four hours, was readily dissolved after addition of a few drops of hydrochloric acid. A watery extraction of the mucous membrane was also experimented with, with the same result; before the addition of hydrochloric acid it did not dissolve albumen; after acidulating it the albumen dissolved easily.

(*To be continued.*)

THE MOTHER PLANT OF WORMSEED.

Abstracted from a Paper of Professor Willkomm.

BY PROFESSOR FLÜCKIGER.

Wormseed is exclusively brought from Central Asia, and consists of flower-buds of a species of *Artemisia*, which is now for the first time described* by Willkomm, Professor of Botany in the University of Dorpat. The plant was brought there by Professor Petzholdt, who had spent the summer and spring of the past year in Turkestan. He had the plant collected there by the people gathering wormseed near the small town of Turkestan, about 44° north lat. and 68° east long., that is to say, between the Aral Sea and the Lake Balkash; the area of the plant probably extends much more eastward. Willkomm gives a full description and diagnosis of the *Artemisia* under examination, of which we will endeavour to abstract the most important parts.

The genus *Artemisia* includes a large number of species, divided by systematic botanists into several tribes. *Seriphidium* is the name of one of these tribes; the species which belong to it are provided with hermaphrodite, homogamous florets. They are inserted on a rather stalk-like receptacle, not a disk, each floret being accompanied by a small bract. The apex of the short receptacle, however, is devoid both of florets and of bracts. The small capitula or heads of the *Seriphidia* exhibit only a few florets, and are arranged so as to form paniculated spikes. The florets and the bracts, as well as the involucral scales, show numerous glands or papillæ, containing an aromatic resinoid substance. The bifurcation of the style becomes obvious only when the floret is fully developed.

The plant from which wormseed is collected is strongly shrubby, its numerous yellowish stems and branches being woody in their lower parts, and attaining a height of from 1 to 1½ ft. The branches are densely tufted; the whole plant, indeed, forms a broom, or at least each stem may be compared with a little broom. The pinnate leaves are thickish, of a greyish-green hue, although they are beset with only a few scattered soft hairs. In the youngest state, the leaves of short shoots are densely covered with grey felted hairs, whereas the fully-developed leaves, as well as the involucres and florets, are entirely naked. This is one of the most prominent characters of the plant under notice, and, as it is well known, of commercial wormseed.

The author had not before him fully developed florets; but in these there occurs the strange fact that the style is club-shaped, much shorter than the stamina, and *enclosed in a very thin transparent membrane*, which disappears when the style begins to be separated into two stigmas. Willkomm has likewise met with a similar membrane in *Artemisia Barrelieri*.

The plant of Turkestan is very closely allied to some other *Artemisiæ*, especially to *A. Lercheana*, Stechm., *A. pauciflora*, Stechm.,—both figured in Gmelin's 'Flora Sibirica,' tab. 50 and 52, the former also much better in Ledebour's 'Icones Floræ Rossicæ,' tab. 488. Another species resembling wormseed plant is *A. monogyna*, Kit.; but all these are covered with a dense felt of whitish hairs. As to the florets of the mother-plant of wormseed, Will-

* In the *Botanische Zeitung* of H. von Mohl and A. de Bary, 1872, March 1st, p. 130.

komm thinks they can scarcely be distinguished from those of *A. Barrelieri*, Bess., which he had observed in Spain. But in external appearance the two last-named species are widely different.

Berg, in his 'Darstellung und Beschreibung der officinellen Gewächse,' etc., 1863, plate xxix. c., having pointed out that the plant yielding wormseed was not known, had bestowed upon it the anticipatory name of *A. Cina*. Willkomm now maintains this name, but then Berg's name should be discarded, and the plant be termed *Artemisia Cina*, Willk. (Berg.). Its full diagnosis is as follows:—

"Suffruticosa, caudice crasso tortuoso, caulibus multis basi lignosis, 3–5 decim. longis, basi foliatis, inde a medio ramulos permultos floriferos erecto-patulos paniculam scopæformem formantes edentibus; foliis basilaribus inferioribusque longe petiolatis bipinnatisectis arachnoideo-villosulis, mediis pinnatisectis floralibusque integris glaberrimis, segmentis omnium linearibus obtusis cartilagineo-mucronulatis, crassiusculis, margine revolutis et nervo medio crasso instructis; foliis basilaribus inferioribusque turiones foliosos incano-tomentosos, superioribus foliorum fasciculos glabros ex axilla edentibus; calathiis numerosis secus ramulos laxe spicato-glomeratis vel simpliciter spicatis, sessilibus erectis, versus anthesin 3 millim. longis oblongis, squamis glaberrimis circiter 12 oblongo-linearibus obtusissimis valde concavis laxe imbricatis, late scarioso-marginatis, dorso vitta viridi in utraque pagina densissime glanduloso-papillosa notatis; floribus 3–6 in squamarum summarum axilla sessilibus per paria dispositis, ovario obovato vix quartam corollæ obconicæ partem longitudine æquante, dentibus corollæ obtusis triangularibus tubo quadruplo brevioribus extus papillis resinosis crebris obsitis."

COORONGITE, OR MINERAL CAOUTCHOUC OF SOUTH AUSTRALIA.

BY JOHN R. JACKSON, A.L.S.,
Curator of the Museums, Kew.

About the end of the year 1865, or the beginning of 1866, a quantity of a peculiar substance was discovered on the surface of the ground in a part of South Australia known as the Coorong. The facts of this discovery were communicated to the Colonial papers, and much correspondence ensued and various opinions were expressed as to the nature of the substance. It is found in a depressed portion of a sandy plain of some considerable extent, and is spread upon the ground chiefly near the edges of the depression. The substance is of various thicknesses up to, it is said, about one foot, and in colour and appearance much resembles india-rubber. It is, to a certain extent, elastic, and burns like caoutchouc, but without smell. At first it was thought to be a deposit of petroleum, and was called "mineral caoutchouc," "coorongite" and "elaterite." Great difference of opinion, however, existed amongst scientific men in the colony, as to whether it was a mineral or a vegetable production, and these opinions seem shared in by scientific men at home, for specimens having recently been received at Kew, were submitted to the Rev. M. J. Berkeley, who expressed an opinion as to its probable relationship with *Pyrenopsis*, or some *collemoid* plant; chemists, on the other hand, believe it to be a kind of mineral caoutchouc; and mineralogists, again, believe it to be of organic origin. In 1869, specimens of the substance were sent to Dr. A. J. Bernays, of St. Thomas's Hospital, for analysis, and the following is the report furnished at the time by that gentleman. "The specimen looked exactly like the caoutchouc found in Derbyshire, near Castleton. The quantity found at Castleton is too small to be available for any useful purpose, but it has always excited great curiosity. The Australian sample is wonderfully rich in hydrogen, and ought to be of use if found in anything like quantity. It contains no less than 97·15 per cent. ($97\frac{1}{5}$) of volatile matter, and no more than 1·97 per cent. of ash. I have estimated the carbon and hydrogen in the sample, and also drawn a distinction between volatile matter and fixed carbon. The analysis may be stated as follows:—

	Per cent.
"Volatile matter	97·190
Fixed carbon	1·005
Ash	1·790
	99·985
Loss	·015
	100·000

"The amount of actual moisture is very small, only 0·4682 per cent. Deducting this from the volatile matter, the analysis would stand thus:—

"Moisture	0·4682
Carbon	64·7300
Hydrogen	11·6300
Ash	1·7900
Fixed carbon	1·0050
Oxygen and other unestimated matters . .	20·3768
	100·0000

"Another analysis gives results:—

"Carbon	64·29
Hydrogen	11·23

"These results are as good as can be expected. The analysis is very troublesome, and may require some, but slight correction.

(Signed) "Albert James Bernays."

Thus, since 1869, we have made little or no progress towards setting at rest its true origin. Several scientific men in the colony have interested themselves in the matter, notably, a Mr. George Francis, whose name is associated with it from the very first; his description of its general appearance and properties, as given in an Australian paper, is so accurate, that notwithstanding its length, we are tempted to quote it in its fulness.

"Appearance and colour resembling caoutchouc or cold stiff gelatinous glue. Fracture coarse and cheese-like, elastic to compression, soft, flexible and easily cut, clammy to the touch, yet does not soil the skin; odour faint, between a vegetable and an animal oil, with a slight smell of caoutchouc. In thin slips burns like a taper, melting before the flame, which is smoky. Specific gravity 0·982 to 0·990. Easily wetted by water, but insoluble therein. Translucent in thin sections; exhibiting under the microscope, especially if moistened with a solution of caustic potash or benzole, a granular and cellular structure with entangled fibres, resembling the fibres of decayed fungi. It thus appears to be in substance an organized cellular tissue, resembling certain forms of fungi, as, for instance, the vinegar plant; and cannot be an oxidized or inspissated vegetable or mineral oil, as such always exhibit their substance amorphous; neither can it be asphalte, petroleum, or elaterite (elastic bitumen or mineral caoutchouc), they also being amorphous, and having the well-known smell of bitumen, especially when burnt. It does not vulcanize with sulphur like caoutchouc. This remarkable substance is carbonized by sulphuric acid in the same way as many vegetable substances, especially vegetable fibre, and cellulose. It is oxidized by nitric acid without the evolution of the odour of musk, or the production of succinic acid. The result of this oxidation is a soft, yellow, oily substance, that is quite liquid at 212° F., and burns with a bright clear flame, less smoky than that of the crude material. On complete combustion of the crude substance a small quantity of the ash is left, that I have not as yet examined.

"On submitting it to destructive distillation, gaseous and aqueous products are evolved, together with acetic acid, and a tarry oil consisting principally of eupion and creasote. These products resemble those of non-resinous woods—ash, elm, oak, etc.—when so treated, but they do not resemble the similar products of bitumens in anything more than the general parallelism of such products.

"These facts go far to satisfy me that this substance is in all probability a vegetable production, having the same elementary constitution as the fixed vegetable oils, and that it does not contain nitrogen or sulphur. . . . .

"It is resolvable into two educts:—

"1st. Soft, semi-fluid, like a balsam, unctuous, but not greasing paper, and, except in its semi-fluidity, resembling vegetable wax. It is combustible, non-volatile, nearly inodorous, of an olive-green colour, soluble in sulphuric ether, chloroform, benzole, the fixed oils, spirit of turpentine, and essential oils. Insoluble in water, dilute mineral acids, absolute alcohol and wood naphtha. Miscible and soluble in excess of glycerine. Combines with caustic potash, forming a soap that is insoluble in water, but soluble in alcohol, which, on evaporation, leaves a soap that is then soluble in water.

"2nd. A tough pulverulent substance, elastic, non-adherent by heat, resembling cork filings, combustible and insoluble, without decomposition in all the above-mentioned menstrua. It is acted on by sulphuric acid and nitric acid in the same manner as the crude substance; it does not vulcanize, and exhibits under the microscope similar organized cellular structure broken up and confused. Solution of caustic potash sufficiently strong to dissolve animal muscle, even at a boiling temperature, has no action on it.

"It appears to be a modified form of cellulose associated, but not chemically combined with the first described educt.

"The whole substance, and the educts it is resolvable into, are curious and novel, of considerable scientific interest, and probably of equal commercial importance, if existing in the abundance stated, namely, that of many miles in area, and in repeated layers. I consider it, therefore, to be neither caoutchouc, elastic bitumen, asphalte, petroleum, nor a dried oil, but a peculiar vegetable fungoid growth, and that it has no connection with coal or any other combustible mineral, except that, perhaps, it may be a hitherto unobserved representative of a vegetation that existed in the older formations, that by mineralization, heat and pressure, gave rise to some of the more resinous bitumens found in thin sheets in strata."

(*To be continued.*)

Chapters for Students.

CHEMICAL NOTES TO THE PHARMACOPŒIA.

BY WILLIAM A. TILDEN, D.SC. LOND.

DEMONSTRATOR OF PRACTICAL CHEMISTRY TO THE PHARMACEUTICAL SOCIETY.

Saccharum Purificatum.—Cane Sugar. Sucrose, $C_{12}H_{22}O_{11}$. [§ Pure cane-sugar, prepared from the juice of the stem of *Saccharum officinarum*, Linn., from plants cultivated in the West Indies and other tropical countries.]

The cane is not the only source of sugar. In France especially, a large proportion of the sugar of commerce is derived from the juice of the common beet.

Cane-sugar is distinguished from other saccharine substances by its crystalline form, by its solubility in about one-third of its weight of cold water, and by its excessive sweetness. When melted by the cautious application of heat, it forms "barley sugar." No change of composition occurs, if the heat has not been too great or prolonged; and, by keeping, the crystalline structure of the sugar is gradually recovered. It is blackened by strong sulphuric acid, but when boiled with water acidified by a few drops of any acid, it yields a syrupy liquid which is less sweet, and no longer crystallizes in the usual way. The substance so obtained is called "inverted sugar," because, whilst a solution of cane-sugar turns the plane of polarization of a ray of polarized light to the right, inverted sugar causes rotation to the left. This left-handed rotation is due to the production of two forms of glucose, one of which is strongly lævo-rotatory, whilst the other is dextro-rotatory, though to a much smaller extent.

$$\underset{\text{Sucrose }(+).}{C_{12}H_{22}O_{11}} + H_2O = \underset{\text{Dextro-glucose }(+).}{C_6H_{12}O_6} + \underset{\text{Lævo-glucose }(-).}{C_6H_{12}O_6}.$$

Cane-sugar, warmed with a solution of tartrate of copper in liquor potassæ, gives no immediate change, but after inversion, by acids or otherwise, it gives, with the same reagent, a copious deposit of red cuprous oxide.

Treated with dilute nitric acid, cane-sugar yields first saccharic ($C_6H_{10}O_8$), and afterwards oxalic acid.

If a solution of inverted sugar be submitted to the action of sodium amalgam, the hydrogen disengaged by the action of the sodium upon the water attaches itself to the glucose, and mannite is formed.

$$C_6H_{12}O_6 + H_2 = C_6H_{14}O_6.$$

In turn, mannite, by a peculiar fermentation or by gentle oxidation, will yield a body having the same composition as glucose.

The mutual relations of these interesting substances will be more intelligible if we compare them to alcohol and some of its derivatives.

$C_2H_5(HO)$ Alcohol.	$C_6H_8(HO)_6$ Mannite (a hexatomic alcohol).
$C_2H_3O.H$ Aldehyd.	$C_6H_6O\left\{\begin{matrix}(HO)_5\\ H\end{matrix}\right.$ Glucose (first aldehyd of mannite).
$C_2H_3O(HO)$ Acetic Acid.	$C_6H_6O\left\{\begin{matrix}(HO)_5\\ (HO)\end{matrix}\right.$ Mannitic Acid (monobasic).
	$C_6H_4O_2\left\{\begin{matrix}(HO)_4\\ (HO)_2\end{matrix}\right.$ Saccharic Acid (dibasic).
$\left.\begin{matrix}C_2H_5\\ C_2H_5\end{matrix}\right\}O$ Ether	$\left.\begin{matrix}C_6H_7O(HO)_4\\ C_6H_7O(HO)_4\end{matrix}\right\}O$ Cane Sugar (first ether of glucose).

The sugar employed in pharmacy should be the best obtainable, and probably white sugar-candy would furnish it in the purest condition. Since most sugar contains a small quantity of phosphate and perhaps other salts of lime, a test should be introduced for the purpose of detecting them. It is more than probable that the different results obtained by different operators in preparing syr. ferri iodidi are attributable to the use of sugar of different qualities.

Saccharum Lactis.—Sugar of milk. Lactose $C_{12}H_{24}O_{12}$. [§ A crystallized sugar, obtained from the whey of milk by evaporation.]

Lactose is distinguished from both cane and grape sugar by its inferior solubility in water, and from the latter by its insolubility in spirit. It also ferments with difficulty. Further, when treated with nitric acid, the chief product of the reaction is mucic acid, a compound isomeric with saccharic acid, but differing from that body in being very sparingly soluble. Milk sugar is probably analogous to sucrose in constitution, as it yields, when boiled with dilute acids, a very soluble fermentable sugar called galactose, which is separable into two portions, both dextrorotatory.

Dissolved in water and warmed with an alkaline solution of cupric tartrate, milk sugar causes an immediate precipitation of cuprous oxide.

Sugar of milk has but very little sweetening power, but, in consequence of the hardness of the crystals, is employed occasionally in pharmacy to triturate with, and dilute other powders which require careful subdivision.

Sapo Durus.—[§ Soap made with olive oil and soda.]

When an oil is agitated with an alkaline liquid an emulsion is produced; and if this be heated to ebullition, the milky character of the mixture is gradually lost, as the globules of oil go into solution.

If soda has been the alkali employed, the soap which is thus formed may be precipitated by the addition of common salt. On standing for a time, a kind of curd forms, which, when collected and pressed into cakes, furnishes hard soap.

The reaction which occurs on boiling the oil and alkaline ley together has been already explained. [See Emp. Plumbi.] The glycerine which is generated in the process is dissolved in the spent leys, which, after the addition of the salt and separation of the soap, are usually thrown away.

Ordinary hard soap is a mixture of oleate and margarate of sodium; the latter is less soluble in spirit than the former, and probably constitutes the deposit which is sometimes met with in Lin. Saponis Comp. Soap which contains a larger proportion of alkaline oleate, and which is more soluble in spirit, is therefore preferable to ordinary hard soap, even when prepared from olive oil. The preparation of such a compound from almond oil is described and recommended by Mr. Wood. (Pharm. Journ. 2nd Series, Vol. XI. p. 415.)

QUINICINE AND CINCHONICINE AND THEIR SALTS.

BY DAVID HOWARD.

In the early part of last year I brought before the notice of this Society an account of an alkaloid from cinchona bark, the properties of which distinguished it from those already described.

Further investigations, following out a suggestion which I owe to Dr. De Vry, of the Hague, convince me that it is identical with the quinicine, first obtained by Pasteur from quinine by the action of heat, and described by him in a paper, a translation of which is to be found in the *Journal of the Chemical Society*, vol. vi. p. 274.*

I now supplement the brief account there given by a more particular description of the crystalline salts of this singular alkaloid, and of the similarly-formed cinchonicine, the allusions to which are very slight in Pasteur's paper; and believe that the result of a further examination will be found to add something to our knowledge of the history of the cinchona alkaloids, and to throw some light on the vexed question of the identity of quinicine with the uncrystallized alkaloids contained in these barks, which in an impure state form the quinoidine of commerce, which Pasteur suggests in the above-mentioned paper, but which still remains undecided.

The result of many experiments on the transformation of quinine and quinidine into quinicine; and of cinchonine and cinchonidine into cinchonicine, confirm Pasteur's observations that "though heat plays an important part in this transformation, the vitreous resinoidal state of the product has nevertheless a real influence on it." Thus we find that the action of heat on a solution of a salt of an alkaloid in water in sealed tubes, even when exposed to a higher temperature than is required under favourable circumstances to convert it wholly into the isomeric modification, is very slight indeed; if, however, a considerable excess of acid be present, the alkaloid is, under the same circumstances, slowly changed, but far less readily than when Pasteur's conditions are observed. On the other hand, acting on a hint of Dr. De Vry's, I find that a mixture of glycerine and neutral sulphate of cinchonine, exposed to the needful heat, is converted into sulphate of cinchonicine *pari passu* with a mixture of the salt with acid. Sulphate of quinine, when heated with glycerine, showed no signs of the formation of quinicine, owing apparently to the slight solubility of the salt in that medium.

The change in the alkaloids is accompanied in all cases by the development of a yellow colour, which seems inherent in the resulting alkaloid; if more heat is used than is absolutely needed, especially when atmospheric air is present, a further decomposition takes place with formation of a darker colour; this may be in great part prevented by heating in an atmosphere of carbonic anhydride.

A careful examination of the salts of quinicine shows that the alkaloid described in my previous paper is identical with it. The greater number of these salts are difficult to crystallize, but the chloroplatinate, the oxalate and the acid tartrate crystallize with comparative ease, and can be obtained in a state of purity. We are

* See Pharm. Journ. 1st series, vol. xiii. p. 374.

thus enabled to observe a fact of some importance, that the salts of quinicine prepared from quinine are exactly similar in all their properties to those prepared from quinidine; in fact, that there is but one quinicine, from whichever of the isomeric bases it may have been derived.

The chloroplatinate precipitated from a hot solution forms a crystalline powder; it can be obtained in definite crystals from a hot acid solution. Its formula is $C_{20}H_{24}N_2O_2 . 2HCl . PtCl_4$. Analysis gives the following results:—

	Pt.
Chloroplatinate of alkaloid prepared from quinine	26·58 p. c.
Chloroplatinate of alkaloid prepared from quinine	26·42 ,,
Chloroplatinate of alkaloid prepared from quinidine	26·45 ,,
Chloroplatinate of alkaloid extracted from quinoidine	26·63 ,,
Theory requires	26·76 ,,

The oxalate, as previously described, has the formula, $2C_{20}H_{24}N_2O_2 . C_2H_2O_4 + 9H_2O$. The analysis gives results as under:—

	$C_2H_2O_4$.	H_2O. 7 at. lost *in vacuo*.	H_2O. 9 at. lost at 100 c.
Theory	10·00	14·00	18·00
Average of previous determinations of oxalate from quinoidine	10·11	14·04	17·91
Oxalate of quinicine prepared from quinine	9·99	14·37	18·02
	—	13·90	18·05
Oxalate of quinicine prepared from quinidine	9·96	14·08	17·83
	—	14·00	17·83

The acid tartrate crystallizes freely from strong solutions in radiated needles; the determinations of H_2O and $C_4H_6O_6$ agree with the formula, $C_{20}H_{24}N_2O_2 . C_4H_6O_6 + 6H_2O$. The salt fuses readily when exposed to a heat of 100° C. By gradual drying at about 50°, it loses 4 atoms of water; and by heating to 140°, the remaining 2 atoms are expelled, with fusion of the salt and slight discoloration. Analysis gives the following figures:—

		$C_4H_6O_6$.	H_2O. 4 at. lost at 50 c.	H_2O. 6 at. lost at 140 c.
Theory		25·77	12·37	18·56
Acid tartrate of quinicine prepared from quinine	I.	26·05	12·80	19·36
	II.	25·29	13·00	—
Acid tartrate of quinicine prepared from quinidine	I.	25·26	11·97	19·31
	II.	25·23	11·83	18·88
Acid tartrate of quinicine prepared from quinoidine	I.	25·97	13·55	17·99
	II.	25·66	13·00	19·29

Cinchonicine and its salts are very similar in their properties to quinicine and its salts; the alkaloid is soluble in ether, separating like quinicine, as an oily layer at the bottom of the solution as the ether evaporates. The salts are somewhat more soluble than the corresponding quinicine salts. The same identity is observed between those prepared from cinchonine and those from cinchonidine that is found between the salts of quinicine prepared from quinine and from quinidine.

The *platinochloride* gives the following results, showing the formula to be $C_{20}H_{24}N_2O . 2HCl . PtCl_4$:—

	Pt.
Theory	27·36
Platinochloride of cinchonicine prepared from cinchonine	27·65
	27·61
Platinochloride of cinchonicine prepared from cinchonidine	27·52
	27·63

The *oxalate* differs from the oxalate of quinicine by containing only seven atoms of water; it very readily loses a portion of this water, and is therefore difficult to dry for analysis; the whole is given off at 100° C. No definite point of hydration is reached by drying *in vacuo*. It is somewhat more soluble than the quinicine salt.

Analysis gives the following results:—

$$2C_{20}H_{24}N_2O . C_2H_2O_4 + 7H_2O \text{ require—}$$

	$C_2H_2O_4$. 10·82.	$7H_2O$. 15·14
Oxalate of cinchonicine prepared from cinchonine gives	11·06	14·30
	10·90	15·18
	11·07	—
Oxalate of cinchonicine prepared from cinchonidine	11·00	14·76
	11·05	15.55

The *acid tartrate* crystallizes in crusts composed of short prisms; this salt contains but one atom of water, which it loses at 120° C. without fusion.

The formula, $C_{20}H_{24}N_2O . C_4H_6O_6 + H_2O$ requires—

	$C_4H_6O_6$. 31·51.	H_2O. 3·70.
Acid tartrate of cinchonicine prepared from cinchonine gives	32·49	3·83
	31·33	3·80
Acid tartrate of cinchonicine prepared from cinchonidine	32·27	3·68

The action of these alkaloids on polarized light also shows the identity of the resulting alkaloid produced by the action of heat on the isomeric alkaloids, the different action on the polarized ray disappearing with the other characteristic distinctions. Quinicine, either from the strongly levogyrate quinine, or from the dextrogyrate quinidine, exhibits a comparatively feeble right-handed rotation, identical within the limits of errors of observation.

The observed molecular rotatory powers of these alkaloids for the yellow ray are as follows:—

In a spirituous solution of the alkaloid—

Quinicine from quinine	♂ 39°
Quinicine from quinidine	♂ 39°
Quinicine from quinoidine	♂ 39·3°

Oxalate of quinicine in an acid solution—

Prepared from quinine	♂ 13·4°
Prepared from quinidine	♂ 14°
Prepared from quinoidine	♂ 14°

Cinchonicine in a spirituous solution—

Prepared from cinchonine	♂ 48°
Prepared from cinchonidine	♂ 48·4°

Oxalate of cinchonicine in an acid solution—

From cinchonine	♂ 18°
From cinchonidine	♂ 17·9°

It will be observed that the rotatory power in both cases is much less in an acid solution than in a spirituous solution of the alkaloid.

It is very difficult to determine what is the exact nature of the change we have been considering. The examination of the optical and chemical properties of successive crystallizations of these salts fails to detect signs of the existence of more than one homogeneous product. The high colour of some of the later crystallizations prevented the use of solutions in the polarimeter strong enough to give more than a very small angle of rotation, and perfectly accordant results are thus unattainable. Still the differences observed between the first and the last crystallizations from considerable quantities are too small to throw doubt on their identity.

Thus the molecular rotation observed in the oxalate of quinicine from the mother-liquor of salts of the alkaloid prepared from quinine was ♂ 13·3°, and of the alkaloid in solution in spirit ♂ 31·6°; that of similarly prepared oxalate from quinidine ♂ 12·2°. Cinchonicine from the last mother-liquors prepared from cinchonine showed a rotatory power of ♂ 44·5°, and its oxalate ♂ 18·5°, while the last portions prepared from cinchonidine showed ♂ 40°.

The question now arises: is the uncrystallizable alkaloid obtained from cinchona bark quinicine, or is it yet another alkaloid really uncrystallizable. Hitherto the most careful purification has failed to obtain crystalline salts from it such as have been described. When quinicine is present, it will, as has been stated, crystallize out of the mixture, but the bulk of the quinoidine, however carefully purified, refuses to crystallize even after many months' standing. It seems highly improbable, though of course it is possible, that this is owing to some impurity which hinders the crystallization: for we find that quinicine-salts prepared from crystallizable alkaloid crystallize entirely with comparative freedom, even when the heat used in its formation has been considerably above the point needed, and sufficient to decompose a portion, and there is no sign of any amorphous modification being formed.

Quinoidine closely resembles quinicine in other respects. When purified, as far as possible, by fractional precipitation and solution in ether, it forms a readily fusible yellow resin. The platinochloride precipitates as an amorphous powder, readily fusible, slightly soluble in hot water, and much more so in hot dilute hydrochloric acid, from its solution in which it falls out on cooling, as an amorphous powder, which under the microscope appears to consist of globules without any sign of crystallization.

The salt precipitated from a cold solution contains 26·59 per cent. of platinum, and after solution in dilute acid 26·28 per cent.; it is, therefore, isomeric with quinine and quinicine.

It is difficult to speak with certainty of the optical properties of this alkaloid, on account of the great difficulty of ensuring absolute purity from the other alkaloids of higher rotatory power, a very small percentage of which would evidently vitiate the results. The specimen, the analysis of the platinum salt of which is given above, showed a specific rotatory power of ♂ 33°; other specimens gave higher results, but their purity was more doubtful.—*Journal of the Chemical Society.*

THE COMPOSITION OF ATMOSPHERIC AIR AND RAIN-WATER.

BY R. ANGUS SMITH.

(*Sixth and Seventh Reports of the Inspector under the Alkali Act of* 1863.)

Impurities of the atmosphere may be discovered by an examination of the rain-water of the locality; or the air may be subjected to artificial washing, and these washings examined. The author has employed both methods. He considers the latter method as affording a more accurate comparison between different atmospheres, since the composition of rain-water necessarily varies according to the amount which falls in a given time, the rain of a dry season being far more impure than the rain of a wet season.

The author's examinations of rain-water are very numerous. The modes of determining the various impurities were in no case gravimetrical, owing to the small volume of water at disposal. The ammonia, albuminoid ammonia and nitric acid were estimated by Wanklyn, Chapman and Smith's methods. The hydrochloric and sulphuric acids were determined from the quantity of water required to produce a certain standard amount of whiteness with solution of silver or barium. The permanganate test was applied to the acidified water, the experiment lasting a few minutes only. The more characteristic results are given in the accompanying table.

It appears that the amount of chlorides in rain-water is dependent on the distance from the sea, and on the direction and force of the prevalent winds; the combustion of coal has a slight effect in increasing the quantity. Sulphuric acid is derived chiefly from the combustion of coal, but is also a product of vegetable and animal decomposition; it always increases as we proceed inland. In sea-water the proportion of hydrochloric to sulphuric acid is 100 to 11·6; excess of sulphuric acid over this proportion is due to terrestrial contamination. Free acids are rarely found, save in the rain-waters of towns. Ammonia is chiefly connected with the combustion of coal, and to a lesser degree with the decomposition of organic matter. Albuminoid ammonia is related solely to animal and vegetable life. Nitric acid may be taken

RAIN WATER.—*Average impurities per million parts.*

Where collected.	Hydrochloric acid.	Sulphuric acid,	Sulphuric acid for 100 hydrochloric.	Free acids calculated as sulphuric acid.	Ammonia.	Albuminoid ammonia.	Nitric acid.*	Oxygen required as permanganate.
Ireland, Valencia	48·67	2·73	6	None	·18	·03	·37	·05
Scotland, five sea-coast country places, west	12·28	3·61	29	·14	·48	·11	·37	·02
Scotland, eight sea-coast country places, east	12·91	7·66	59	2·44	·99	·11	·47	·65
Scotland, twelve inland country places	3·38	2·06	61	·31	·53	·04	·31	·26
England, twelve inland country places	3·99	5·52	138	None	1·07	·11	·75	·47
Scotland, six towns (Glasgow excluded)	5·86	16·50	282	3·16	3·82	·21	1·16	1·86
Darmstadt	·97	29·17	2998	1·74	—	—	—	—
London†	1·25	20·49	1645	3·10	3·45	·21	·84	—
England, six manufacturing towns	8·70	34·27	394	8·40	4·99	·21	·85	2·74
Manchester	5·83	44·82	768	10·17	5·96	·25	1·01	3·22
Glasgow	8·97	70·19	782	15·13	9·10	·30	2·44	10·04

as a measure of "purified sewage." The permanganate test denotes a variety of products, both from coal and organic decomposition.

To examine air by washing, the author shakes 50 c. c. of water in an empty 2-litre bottle; then draws out the washed air by one stroke of a flexible bellows-pump 1½ times the capacity of the bottle; agitates as before the fresh air which has entered; and repeats the operations 10 to 100 times, according to the purity of the atmosphere. In this plan the volume of air used is only known approximately, the results are therefore comparative instead of absolute. The following are some of the results obtained by washing, the purest air being taken as 100:—

* Nitrous acid is here included.
† Average of a few specimens only.

Locality of atmosphere.	Hydrochloric acid.	Sulphuric acid.
Blackpool	100	100
Didsbury	277	320
Buxton	247	345
London	320	361
St. Helen's	516	468
Manchester	369	549
Metropolitan Railway	974	1554

Locality of atmosphere.	Ammonia.	Albuminoid ammonia.
Inellan	100	100
London	117	116
Metropolitan Railway	138	271
Glasgow	159	221
A bedroom	194	173
Office at Manchester	235	194
A midden	644	302

By means of these air-washings a chemical climatology may be established.

The author has determined the amount of oxygen and carbonic acid occurring in air under a variety of circumstances; the more characteristic results are as under:—

Where collected.	Oxygen per cent.	Carbonic acid per cent.
Top of hills, Scotland	20·980	·0332
London, parks and open places	20·950	·0394
London (average of 68 analyses)	20·885	·0439
Glasgow, open places	20·929	·0461
Glasgow, closer places	20·889	·0539
Metropolitan Railway tunnels	20·700	·1452
Theatres, worst parts	—	·3200
Mines (average of 339 analyses)	—	·7850
When candles go out	18·500	—

—*Journ. Chem. Society.*

MUCILAGE OF ACACIA.

BY R. ROTHER.

Mucilage of gum arabic prepared by the U. S. officinal method is remarkable for its instability; only a few days, and under peculiar conditions a few hours, sufficing to render it sour, and consequently unfit for medicinal use. Mucilage for medicinal purposes is an article of great utility to the pharmaceutist in the making of pills, emulsions and other mixtures with which gum is prescribed. For these purposes it is always far superior to the powdered gum. But on every occasion it should either be quite recently prepared or otherwise preserved from change. The moderately circumstantial and rather tedious operation of dissolving the gum when in the original pieces debars the possibility of an expeditious process for extemporaneous application. In view of these facts, the addition of the least objectionable preservative can only meet with approval. Glycerine has been recommended and used for nearly everything, and there exists not the slightest doubt but that it enters largely into pharmaceutical productions. Now, while glycerine may be positively injurious in some cases, it has become actually indispensable for others. Too frequently it is introduced where there is no cause for its presence, and often where its influence would be beneficial the proportion was not sufficient to be effective.

The decomposition of mucilage of acacia when once begun cannot be checked or even retarded with glycerine, but can be prevented by a sufficiency of glycerine, if this be present before any change could supervene. This is only secured by mixing the glycerine with the water before its addition to the gum. Next important to the solvent is the manner in which the solution of the gum is effected. This operation can be most promptly and thoroughly performed by placing the original pieces of the gum into an appropriately sized bottle, and adding the mixture of glycerine and water. The bottle is then securely corked, the whole well shaken, and the bottle laid down on its side in a horizontal position; after ten or fifteen minutes the layer of agglutinated gum is moved into a vertical position by revolving the bottle; after the column has subsided, the bottle is further revolved in the same direction. Having thus moved the bottle three or four times during the interval of about twelve hours, complete solution has taken place. The mucilage is now well shaken and strained through muslin. The straining can be very rapidly done by placing a proportionately large sheet of moistened muslin over a funnel supported on a bottle; the funnel is then filled with the liquid, two opposite sides of the strainer folded together, and the ends twisted in opposite directions. When all the liquid has been forced out, a fresh portion is similarly treated until all has been strained. The proportion of the glycerine to be used is one in eight of the product. The following formula is in officinal proportions, only that eight ounces of water is replaced with an equal measure of glycerine; one fluid ounce contains three drachms of acacia and one fluid drachm of glycerine:—

Take of Acacia, in pieces, 24 troy ounces.
Glycerine, 8 fluid ounces.
Water, 2½ pints.

Mix, and conduct the process as above directed.—*The Chicago Pharmacist.*

THE ORANGE.

The orange is a native of China and India, and is supposed to have been introduced into Italy in the fourteenth century. Gallesio states that oranges were brought by the Arabs from India by two routes—the sweet ones through Persia to Syria, and thence to the shores of Italy and the South of France; and the bitter, called in commerce Seville oranges, by Arabia, Egypt, and the North of Africa, to Spain. Thus, all the old orange groves at Seville, planted by the Moors, were the bitter-fruited variety; and the first sweet orange is stated to have been reared at Lisbon, and became commonly known as the Portugal or Lisbon orange. A traveller in Spain, writing of its orange groves, says, "At Cordova, in the Court of Oranges of the old Moorish mosque, now the cathedral, the splendid avenues of orange-trees, all of them centuries old, were a most interesting sight. The lines of the orange-trees in the court corresponded with the lines of the pillars, 1096 in number, in the interior." He also mentions having visited the Alcazua, the most beautiful of Moorish palaces: "Its garden is a marvel of beauty. The most striking thing, however, was the celebrated orange-tree of vast dimensions, and said to be 600 years old. Its stem is split into several trunks, and covers the ground-space of a good-sized vat."

One thing remarkable in the citron family is that, although a tropical genus, it ripens its fruit in all countries in which it becomes naturalized only in the winter months: and from this peculiarity it has probably been enabled to travel from India to the southern shores of Europe, and to find a congenial locality in the equable and temperate climate of the Azores, Cape of Good Hope and New South Wales. The varieties of the citron family thrive in great luxuriance in the open air in the districts around Sydney, Hunter's River, and other suitable portions of the Colony of New South Wales, more especially in sheltered situations in the vicinity of the inland creeks or salt-water rivers (as they are termed by the colonists), such as the Paramatta, the Hunter, and others. In localities of this description fine, healthy, umbrageous orange-trees are planted in groves, their dark green glossy foliage contrasting beautifully with the clusters of delicate white, waxy-looking flowers, which diffuse a rich fragrance in the surrounding atmosphere, and attract by their perfume innumerable swarms of bees, butterflies and other insects; while, at the same time, the fruit may be seen in every stage of ripening. It has always been found that lemon and orange trees thrive luxuriously on a sloping ground, in sheltered situations, near the salt water, or under the influence of the sea air, yet not exposed to the sea breeze. They always grow best, too, where they can enjoy the genial warmth of the morning sun.

The orange-tree generally begins to bear about the third or fourth year; but growers seldom or never permit the fruit to come to maturity until the fifth or even the seventh or eighth year, by which time the tree has attained a considerable size, has more vigour, and will then probably, with care and attention, bear fruit to the age of sixty or seventy years, and even more. Most orange-growers have a habit of planting the trees too close together. But this is a great mistake. There is not a tree that exhausts the soil more rapidly than the orange; and thus, when there is not a fair distance between orange-trees at the planting, one is apt, in time, to destroy the other. It is a common saying in orange-growing districts, that "the greatest enemy to the orange-tree is its own kind."

As the orange-tree increases in age, so the fruit improves in quality, that is, if it is originally a healthy tree and grafted on a good stock; the younger trees bearing fruit with a thicker rind and abundance of seeds. As the tree becomes older the skin becomes thinner, the fruit much more juicy, and the seeds diminish in number. As a rule, the older the tree the thinner is the skin and the more luscious the flavour of the fruit. Some of the trees at the Azores bear at a very great age. It is no uncommon thing to see a tree a hundred years old still bearing plentifully a highly-prized thin-skinned orange, full of juice and free from pips.

Mention has just been made of the seeds of the orange. All the species of the citron family may be propagated by seeds, grafting, budding, or layers. The plants raised from seed are generally used for grafting and budding, as they are considered to possess greater durability and productiveness. The fruit is sweeter; but they take a longer time to come into bearing.

By judicious pruning, the health and graceful appearance of the tree are much improved; and when it is borne in mind that the blossoms of the citron tribe are produced in the form of terminating peduncles on the wood of the current year, the object of pruning ought to be to encourage the production of young wood in every part of the tree. The wood of the citron tribe is hard, compact and durable. This family is remarkable for the dotted appearance of all parts of the plants, in consequence of their abounding in little cells filled with a volatile and frequently highly fragrant oil. For instance, on holding up the foliage of the orange-tree to the light, it is observed to be covered with innumerable minute glands, which secrete an essential oil in large quantities.

The flowers of the orange have somewhat of a warm and bitter aromatic taste, and are not only held in high esteem as a perfume, but are used for making orange-flower water, as they give out their flavour by infusion. This preparation is extensively used, more particularly among the French, for nervous and hysterical complaints.

The Chinese scent their teas with orange-flowers. The method has been thus described:—"In a corner of the building there lay a large heap of orange-flowers, which filled the air with the most delicious perfume. A man was engaged in sifting them to get out the stamens and other smaller portions of the flower. This process was necessary, in order that the flowers might be readily sifted out of the tea after the scenting had been accomplished. The orange-flowers being fully expanded, the large petals were easily separated from the stamens and smaller ones. In one hundred parts, seventy per cent. were used and thirty thrown away. When the orange is used its flowers must be fully expanded, in order to bring out the scent. When the flowers had been sifted over in the manner described, they were ready for use. In the meantime, the tea to be scented had been carefully manipulated, and appeared perfectly dried and finished. At this stage of the process it is worthy of observing that, while the tea was perfectly dry, the orange-flowers were just as they had been gathered from the trees. Large quantities of the tea were now mixed up with the flowers, in the proportion of forty pounds of flowers to one hundred pounds of tea.

"This *dry tea* and the *undried flowers* were allowed to be mixed together for the space of twenty-four hours. At the end of this time the flowers were sifted out of the tea, and, by the repeated sifting and winnowing process which the tea had afterwards to undergo, they were nearly all got rid of."

The flowers of the Seville orange yield a very delicious water and essential oil, which are much patronized by the Egyptian ladies.

Piesse says, in his work on the art of perfumery, "Some plants yield more than one odour, which are quite distinct and characteristic. The orange-tree, for instance, gives three—from the leaves one called *petit grain;* from the flowers we procure *neroli;* and from the rind of the fruit essential oil of orange, *essence of Portugal.* On this account, perhaps, this tree is the most valuable of all to the operative perfumer."

Some idea of the commercial importance of the flower-growing trade may be formed when it is said that one of the large perfumers of Grasse and Paris employs, annually, 80,000 lb. of orange-flowers, 50,000 lb. of cassia-flowers, 54,000 lb. of rose leaves, 32,000 lb. of jasmine-blossoms, 32,000 lb. of violets, 20,000 lb. of tuberose, 16,000 lb. of lilac, besides rosemary, mint, thyme, lemon, citron and other odorous plants, in larger proportion.—*Good Health.*

THE BEHAVIOUR OF STARCH AND DEXTRINE TO IODINE AND TANNIC ACID.

BY V. GRIESSMAYER.

The author describes minutely the effects produced on the addition of a weak iodine solution and of tannic acid solution, to starch solutions which have been kept for various lengths of time exposed to the air at the ordinary temperature, the conclusion at which he arrives being that filtered starch-paste is in a state of continual chemical change. The solutions employed were:—1. A decimille-normal iodine solution. 2. An aqueous solution of tannic acid containing 3·5 grm. pure tannin in 300 c.c. 3. A filtered starch-solution, which was always prepared by triturating 3·5 grm. wheaten starch with 50 c.c. cold water, pouring into 300 c.c. boiling water, boiling for a few minutes, and then filtering whilst hot. On adding either of the reagents to 20 c.c. starch solution, the following reactions were observed:—

1st day.—With iodine, 1–7 c.c. produced no coloration whatever; 7·5–8 c.c., a violent shade; 9–10 c.c., a faint blue, which became distinctly blue only after 16 c.c. had been added. With tannic acid, the first drop produced a precipitate of tannate of starch, which redissolved on shaking; the second drop a permanent precipitate. This latter is dissolved on warming, but reappears on cooling. No alteration in these reactions on the second and third days.

4th day.—A flocculent separation was visible in the starch-solution, which, after filtration, exhibited the same reactions as on the first day.

5th day.—11 c.c. iodine gave a faint violet; with 17 c. c., a blue tinge, becoming more and more intense up to 25 c. c., but more of a lilac colour. Tannic acid: same reaction as on first day.

6th day.—With iodine, a perceptible violet shade only after 20 c. c., but slightly deepened up to 25 c. c. A few drops of tannic acid caused a precipitate, which disappeared however on shaking; a permanent precipitate only after several drops.

7th day.—22 c. c. iodine gave a violet tint, changing to red with 25 c. c., and becoming pure red with 30 c. c.; 10 c. c. of tannic acid were required to cause opalescence, a slight precipitate separating after some time.

8th day.—A red tinge with 10 c. c. iodine, becoming gradually more distinct until perfectly red with 20 c. c. An excess of tannic acid causes opalescence.

9th day.—A red coloration with iodine; no precipitate with tannic acid.

10th day.—No coloration with iodine; a yellowish tinge with an excess. Also no reaction with tannic acid. The solution then remains one to two days in this state, after which sugar is formed, and may be easily detected by Fehling's solution. After another week the sugar has disappeared, and the liquid is strongly acid. The author notes that decinormal iodine solution is perfectly decolorized by exposure to the air for about six weeks; a millenormal solution in three to six days, and a decimillenormal solution on standing overnight. This is due, not to the evaporation of iodine only, but in great measure to the formation of hydriodic acid.

The author's interpretation of the above results is, that the solution obtained by treating starch with hot water passes through three stages of change when allowed to stand, until it is finally converted into glucose and other products. It is impossible to obtain a starch solution quite free from dextrin in the above manner, for perfectly fresh solution was never coloured blue by the addition of 6–10 c. c. decimillenormal iodine solution but always violet, the red colour of the iodized dextrin forming violet with the blue iodized starch; the first drop of tannic acid also gave a precipitate, which disappeared on shaking, because of the greater affinity of the tannic acid to dextrin than to starch, in consequence of which it does not combine with the latter till the whole of the dextrin is neutralized.

A starch-solution allowed to stand about a week, during which time a flocculent precipitate is deposited, yields a red colour with 10–20 c. c. of decimillenormal iodine solution, which colour corresponds to a dextrin obtained both by mashing and in the artificial preparation of dextrin. It is nearly always accompanied by a second dextrin, which forms a *colourless* compound with iodine. Dextrin I. may moreover be readily detected in the presence of much starch by operating with dilute iodine; no starch reaction is observed until the whole of the dextrin is saturated. With starch in the presence of much dextrin, no starch reaction is obtained, until a concentrated iodine-solution is employed, so that both bodies may be readily detected when in the same solution.

Tannic acid does not precipitate dextrin, and when starch is also present, the precipitate redissolves until the whole of the dextrin is fixed.

If the starch-solution is allowed to stand more than a week in contact with air at a certain stage, the addition of decinormal iodine, drop by drop, causes a red streak, which, however, immediately disappears; the next day even this is perhaps not observed, and yet sugar is not to be detected in the solution, and in this case the addition of an excess of iodine causes no coloration; in the first the reaction of dextrin I. is obtained. The body now present in the liquid the author terms dextrin II., *dextrin passive to iodine*, for which it has a greater affinity than dextrin I. He considers that it is also co-existent with dextrin I. in the fresh starch-solution, since 5–6 c. c. of the weak iodine may be added without causing the slightest coloration.

Tannic Acid in its action on Iodine, Starch, and Iodized Starch.—By the addition of an excess of tannic acid to an iodine-solution, the latter becomes gradually decolorized. Tannic acid also causes the decoloration of iodized starch-solution. In both cases the iodine is reduced to hydriodic acid. In order to investigate the action of iodine on tannic acid, 60 grms. iodine, 60 grms. tannic acid, and about 800 c. c. water were digested in a stoppered flask on the water-bath, at a mean temperature of about 92°, the flask being repeatedly shaken. After some days the whole had dissolved to a dark brown liquid, from which over night a voluminous precipitate of gallic acid separated, but was redissolved on heating. After four to six days a permanent dark black crystalline precipitate formed on the sides and bottom of the flask, to obtain a good yield of which the operation had to be continued for six to eight weeks. The black substance was purified by digestion with dilute ammonia, and washing with water; a yellow body was thus obtained, which was dissolved in soda, re-precipitated by acid, and then washed until free from sodium chloride. The composition and reaction of this product proved it to be ellagic acid, $C_{14}H_6O_8 + 2$ aq., the yield being about one-fourth of the tannic acid employed. The filtrate from the crystals, which deposited much gallic acid on standing in the flask, was evaporated to a small bulk, and the remaining liquid decanted from the gallic acid which had separated. In order to prove the presence of sugar and hydriodic acid, which it was probable were also products of the reaction, an excess of a stiff starch paste was added to a portion, to remove free iodine, and the whole allowed to stand an hour or two, the supernatant liquid being then removed by a siphon. The addition of a crystal of potassium nitrite to this liquid at once produced a deep blue coloration, proving the presence of hydriodic acid. In testing for sugar, the iodine, hydriodic acid and gallic acid were removed by basic lead acetate, the filtrate saturated with hydrogen sulphide, evaporated somewhat, and finally Fehling's solution added, when, on warming, cuprous oxide was deposited. The products of the action of iodine on tannic acid are therefore ellagic, gallic, and hydriodic acids and sugar. Doubtless the tannin is first split up into gallic acid and sugar, the gallic acid afterwards yielding ellagic acid, in proof of which the following experiment was made:—10 grms. gallic acid, 10 grms. iodine, and 160 c. c. water were digested together for several days on the water-bath; the same characteristic black crystals as above were obtained, and proved to be ellagic acid; after adding an excess of basic lead acetate to the filtrate, etc., no sugar could be detected. The reaction is probably

$$2\ C_7H_6O_5 + I_2 = (C_{14}H_6O_8 + 2\ H_2O) + 2\ HI.$$

—*Journal of the Chemical Society.*

FIRE AT MANCHESTER.

On Sunday last a very disastrous fire occurred in Manchester, on the premises of Messrs. Woolley and Sons, wholesale and retail druggists, 69, Market Street, by which damage was occasioned estimated at £20,000. The fire was discovered between four and five o'clock in the morning in the warehouse in Swan Court, and the fire brigade, were promptly in attendance. By the time of their arrival, the second or ground-floor of the warehouse, which was extensively stocked, was in flames, that were rapidly communicating with the upper floors, and were also extending to the retail shop in Market Street. By seven o'clock the fire was so far subdued that the use of the steam fire-engine and a number of jets were dispensed with. The building and its contents were almost entirely destroyed, and several of the adjoining buildings were damaged by water. The origin of the fire cannot be ascertained. Messrs. Woolley and Sons are insured in the Lancashire and other offices.

The Pharmaceutical Journal.

SATURDAY, MARCH 23, 1872.

Communications for this Journal, and books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*
Instructions from Members and Associates respecting the transmission of the Journal should be sent to ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*
Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

POISONING BY MISADVENTURE.

THE terrible case in Devonshire, which occurred last July, and for which a chemist's assistant has lately been tried for manslaughter, is one of the most melancholy proofs ever brought before the public that every man who presumes to compound medicines should possess a competent knowledge of the business he undertakes. Far be it from us to add one pang to the anguish which this young man must undoubtedly suffer from having even innocently caused the death of a fellow-creature; but we feel it to be the duty of this Journal—a Journal specially designed to watch over the interests and guide, as far as may be, the education and conduct of pharmacists—to point to the blots which disfigure our profession, and to hold up such cases as that now before us as danger-signals to our brethren. A full report of the trial will be found in another page of our present issue. Briefly stated, it appears that an invalid, having some knowledge of drugs, wrote a prescription for a mixture containing, as one of its ingredients, half a drachm of solution of muriate of morphia, of which half was to be taken for a dose.

This prescription was taken to the shop of a chemist, where, the master being absent through illness, it fell into the hands of his brother, who was assisting in the business. Instead of thirty minims of *solution*, twenty grains of *solid* muriate of morphia were put into the mixture; before intimation of the error could be conveyed to the invalid he had swallowed his dose, and, notwithstanding the combined efforts of three medical men to save him, he died in a few hours.

The explanation given by the learned Counsel who defended the accused was, that the writing being illegible, the abbreviation of the word solution —"sol."—was read by the dispenser as "sal;" and, accordingly he construed it as SALT of muriate of morphia; that "solutio morphiæ muriatis" was an improper term for a prescriber to use, the preparation intended being correctly called "liquor morphiæ muriatis." On this plea the jury, after two hours' consideration, brought in a verdict of acquittal.

Now, it is at this point that our duty begins. It is quite true that prescribers sometimes write indistinctly. It is true also that the Latin name given to the article in the Pharmacopœia is "liquor;" but immediately under the Latin name in the Pharmacopœia the English title, "solution of hydrochlorate of morphia" appears. Over and over again we have seen the words, "sol. morph. mur." in a physician's prescription, but we never saw "sal morphiæ muriatis" written in a prescription.

We venture to say that any candidate for the Minor Examination of the Pharmaceutical Society dispensing before the Board a prescription in which the "o" in "sol" had even the semblance of an "a," with the *solid* muriate, would be rejected as a person unfit to be trusted to compound medicines, and should never be employed by any master who holds the lives of his customers as a precious charge in his keeping. Again, without trenching on the province of the physician, the Board of Examiners insist on that knowledge of doses which would certainly prevent any man from sending out a mixture with ten grains of morphia in each dose, and this lamentable accident is an overwhelming proof of the necessity of their doing so.

No man can be positively proof against misadventure, and we have been reluctantly compelled to make these observations,—compelled alike by the safety of the public and the safety, credit and comfort of our brethren, for this is a case which throws doubt on us all.

The moral appears to us to be, that chemists should not only be themselves duly qualified, but should insist that every person entrusted by them to dispense medicine should be qualified also, if not by examination, at least by proper tuition and practice.

"HARMLESS" ADULTERATION.

THE encouraging remarks recently offered by Mr. MUNTZ, in regard to the impossibility of his proposed Adulteration Act being made use of to interfere with any one who chose to mix beans with coffee, or water with milk, would seem to have operated already as a stimulus to enterprise in that direction, if we may judge from the somewhat ambiguous terms of the following advertisement, which the *Grocer* reproduces from a daily contemporary.

PARTNERSHIP or otherwise.—To Wholesale Grocers and others.—A German gentleman, having invented a process of imparting to inferior kinds of coffee the aroma and strength of the very best brands, and at the same time removing all detrimental substances from the beans, wishes either to dispose of the same or to find a partner with not less than £4000. Profits may be estimated at 50 per cent. For interview, address, etc.

Under the most favourable interpretation, it is evident that, by means of this "invention," "inferior kinds of coffee" are to be passed off for the "very best brands;" but the estimate that the profits of this transaction will amount to 50 per cent., seems calculated to suggest some misgiving as to the kind of "*beans*" that are to be used in the practice of this invention.

AMERICAN "BOGUS" DIPLOMAS.

As will be seen by the report of the discussion at the February meeting of the Philadelphia College of Pharmacy, the question of the sale of American medical diplomas, which has now for some time been recognized in this country as an evil, has at length attracted the attention of the American authorities. We learn from the *American Journal of Pharmacy* that the Pennsylvanian Senate has appointed a committee to investigate the matter. Several meetings have been held, and the following is given as illustrative of the testimony brought before the Committee:—

"Dr. Bissell declined to answer the question, whether he knew anything about the sale of diplomas, because it might criminate himself. Mr. Jos. B. Reed, reporter of the *Age*, testified that Dr. Buchanan, of the Eclectic Medical College, offered him a diploma for $25. Mr. C. S. Bates obtained his diploma from the same college after six months' study; he kills smallpox with sweet spirits of nitre and cold water, has a right to do as he pleases with his own patients, and doctored several years before he got his diploma. Dan. Parlow, coloured, an herb doctor, received, as a mark of honour, a diploma from Dr. Buchanan through Dr. Bissell. A. W. H. Hacks, coloured, attended two courses of about six lectures each at the American University of Philadelphia, and obtained a diploma for $25. Jonathan Davis, coloured, received his diploma from the same institution for $30, after attending one course of (six?) lectures. Dr. Dan. M. Fleming received an honorary degree from the Philadelphia University of Medicine and Surgery for $30. Dr. Harbison told Dr. Hylton that he could get Paine's diplomas (Philadelphia University of Medicine and Surgery) to sell to any one who wished to buy them."

CHEMICAL NOTATION OF THE PHARMACOPŒIA.

It was stated by Dr. Quain, at the recent meeting of the Medical Council, that the Pharmacopœia Committee had determined to adopt the unitary system of notation.

We think it necessary to state that the letter at p. 780, from Mr. Joseph Ince, is inserted for his satisfaction in regard to those who do not know him; those who do would not suspect him to be the author of the vulgar personalities he refers to. However, we sympathize with his affliction, and hope his case will serve as a warning.

Transactions of the Pharmaceutical Society.

EXAMINATIONS IN LONDON.

March 20th, 1872.

Present—Messrs. Allchin, Barnes, Carteighe, Cracknell, Davenport, Edwards, Gale, Garle, Hanbury, Haselden, Ince, and Linford.

Dr. Greenhow was also present on behalf of the Privy Council.

MAJOR.

Six candidates presented themselves for the Major examination; of these, *one* failed. The following *five* passed, and were declared duly qualified to be registered as "Pharmaceutical Chemists":—

*Maitland, John Edward ...... London.
*Smith, John Francis .... Scarborough.
*Webb, Herbert Charles ...... London.
Jones, Moses .... Swansea.
Morgan, Richard .... London.

MINOR.

Twenty-one candidates presented themselves for the Minor examination; of these, *eleven* failed. The following *ten* passed, and were declared duly qualified to be registered as "Chemists and Druggists":—

*Moss, Albert .... Ilkeston.
*Chambers, Pearson .... Cockermouth.
*Cottman, Henry .... Poole.
Latham, Robert John .... Worksop.
Wylde, John .... London.
Plowman, Sydney .... Boston.
Dear, James Edward .... St. John's Wood.
Harrington, John Frederick .. Rochford.
Kent, George Frederick ...... Bristol.
Williams, William Francis .. London.

The above names are arranged in order of merit.

PRELIMINARY.

The undermentioned Certificates were received in lieu of this examination.

Certificate of the University of Durham.

Roberts, William Henry ...... Bath.

Certificate of the University of Oxford.

Legg, Henry Arthur .... Kingsland.

Provincial Transactions.

MANCHESTER CHEMISTS AND DRUGGISTS' ASSOCIATION.

The last Ordinary Monthly Meeting of the session was held in the Memorial Hall, Albert Square, on Friday evening, March 8th; Mr. W. Wilkinson, Vice-president in the chair.

The Secretary read the minutes of the last meeting and acknowledged the receipt of the *Chicago Pharmacist*, from the editor; the *Calendar of the Pharmaceutical Society* and the current numbers of the *Pharmaceutical Journal*, from the Society.

Mr. J. T. Slugg, F.R.A.S., then read his paper on "The Materia Medica and Pharmacy of the Bible:"—

Mr. Siebold said Mr. Slugg had, as usual, treated his subject in a most exhaustive manner, and had left scarcely any room for discussion; indeed, he had so fully explained every allusion as he went on, that there was no need even of asking questions. He (Mr. Siebold) thought there was one, and one only, article of ancient materia medica to which Mr. Slugg had not alluded, and that

* Passed with honours.

was one more used perhaps in modern pharmacy than any other, viz. water. They were all very much indebted to Mr. Slugg for the pains he had taken in the arrangement of his paper.

Mr. F. B. Benger said those who were interested in the subject Mr. Slugg had brought before them, and were willing to turn from the pharmacy to the pharmacists of the Bible, would find an interesting paper on the "Dignity of Ancient Pharmacy," by M. Donovan, in the Pharm. Journ. for October, 1862, not only did professional physicians practise pharmacy, but emperors, prophets and apostles occupied themselves with amateur dispensing,—among others, Solomon, David and Agrippa, were versed in the materia medica of the age; and the prophet Esdras, while an exile in Babylon, invented a celebrated medicine containing a hundred and ninety ingredients.

A cordial vote of thanks, proposed by Mr. Fisher, seconded by Mr. Peatson, was carried with acclamation.

The Chairman then read a letter addressed to the President of the association, by Mr. W. V. Radley, of Sheffield, on the subject of provincial education and the aid which might be looked for from the funds of the Pharmaceutical Society. After some discussion the consideration of the subject was referred to the Council of the Association.

Mr. Siebold announced his intention of delivering, during the summer, a gratuitous course of lectures on "Analytical Chemistry," admitting only those students who had shown their interest in self-improvement by attending previous classes.

SHEFFIELD PHARMACEUTICAL AND CHEMICAL ASSOCIATION.

The Education of Chemists' Assistants.

A Special Meeting of the chemists and druggists of Sheffield and neighbourhood was held on Friday night, March 15, in the rooms of the Music Hall, to consider the attitude of the Council of the Pharmaceutical Society towards institutions for pharmaceutical education in the provinces, and further to consider the correspondence that had been passing between the Sheffield Council and the Council at Bloomsbury Square; Mr. W. V. Radley, President of the Sheffield Association, occupied the chair, and there was a fair attendance.

The Chairman said the subject of the education of chemists' assistants in the provinces—that they might be enabled to pass the strict examinations required by the Pharmacy Act—was one of great importance, and it was in order that the assistants might be supported that the Sheffield and kindred associations had been formed. At the annual meeting in May, of the Pharmaceutical Society, in London, he ventured to suggest that the Parent Society ought to render pecuniary aid to local associations. He felt convinced that local associations unaided were unable to furnish that amount of scientific knowledge to the assistants which seemed to be absolutely necessary under the altered state of circumstances. As there were handsome funds in the hands of the Association in London, he, for one, thought that the provinces had claims upon them. The Sheffield Association had, last year, to take £15 from a fund which was subscribed for other purposes, in order to augment the sums paid by the young men to the lecturers. The society did not begrudge the expenditure if the funds were equal to it, but it was impossible that the same thing could be done again. The subject seemed to him to be of so much importance that he had written to ten or a dozen of the chairmen of other of the northern country associations, inviting them to lay the matter before their members. The three ways in which he proposed the subject could be treated, were:—(1) To make a united representation of their opinions, either by letter or deputation to the Council; (2) to jointly select and send men to the Council as representatives who would support their views; and (3) to hold a meeting of delegates from all the associations in the Midland and Northern Counties in a central town, such as Leeds or Manchester, to discuss the matter. This representation had had effect, and several of the provincial associations had already taken the matter in hand.

Several resolutions had been received and delegates appointed; and in other cases most favourable replies had also been received from the Presidents of the Associations communicated with.

Mr. Job Preston, Honorary Secretary, then read the voluminous correspondence that had taken place between the Sheffield Association and the Council of the Pharmaceutical Society, from which it appeared that the correspondence had extended over a lengthened period of time. In the course of the correspondence allusion was made to the fact, that, in the session of 1870–71, the Sheffield Association had arranged a very complete course of classes for the study of chemistry, botany and materia medica, being of opinion that they could receive help from the parent institution. On the 30th November of that year they applied for a grant of £21, and received a reply from the Council in London stating that, while they were willing to give assistance to enlarge the library or purchase diagrams, money could not be granted for augmenting lecturers' fees. The request was repeated in September, 1871, but with the same unsatisfactory result. Another request was made in October of the same year for the exact deficit, which was shown to result from the engagements entered into with the lecturers, on the faith of receiving help, the sum amounting to £13. 10*s.*; this likewise met with a refusal. Fifteen guineas was the difference between the amount realized by students' fees and the sum guaranteed to the lecturers, and, as stated by the Chairman, the local association had to pay the money.

Other letters were read which pointed out that, unless provincial associations were liberally dealt with in this matter, great evil must result.

The Secretary then read out a few items from the financial statement of the Pharmaceutical Society, page 945, of May 27, 1871, Journal. The correspondence entered into between Mr. Radley and Presidents of other associations was then read, after which,—

Mr. G. B. Cocking, Vice-president, in proposing the first resolution, intimated his entire concurrence with the spirit in which it had been framed; he said he had done his share in the formation and establishment of the association, the primary object of which had been to provide the means of imparting a sound scientific education to the associates. The necessary appliances had been provided, viz. comfortable and convenient class-rooms, a small but select library, materia medica and other specimens, microscope, etc., but, owing to the inertness of a majority of the masters and the limited number of associates who had attended the classes, the fees paid to the teachers had to be very considerably supplemented from the private purses of the members of the Council or from the general fund of the association. The *ordinary* expenditure being equal to the income, he had reluctantly come to the conclusion that the educational department must be given up, unless an annual grant could be obtained from the Council of the Pharmaceutical Society, and the associates must be left either to their own resources for obtaining their education, or to rely upon a few months' "cram," to enable them to pass the examinations requisite for entitling them to add "P.C." to their names. He did not wonder at the inertness of the employers. The "Pharmacy Act, 1868," so far as Sheffield was concerned, was all but a dead letter,—unregistered persons were allowed to sell poisons, and registered chemists and others were allowed to sell diluted and adulterated drugs. He retailed "sp. etheris nitrosi," of Pharmacopœia strength, at 4*d.* the ounce; but had, recently, several times been annoyed by customers stating that they never paid more than 3*d*. He knew the cost of the genuine quality, and, no doubt, that what was sold at the lower price was either considerably diluted or adulterated with methylated spirit. Cases in which the Act had been infringed had been brought under the notice of the Pharmaceutical Society; their reply being, in effect, "prosecute the infringers yourselves, and, if you obtain a conviction, we will pay the costs." He (Mr. C.) objected to become an informer against a neighbour; he could not afford to take upon himself the discredit which invariably attached to a private informer. In that town, he asked, why did not the Pharmaceutical Society employ private detectives and informers? It cost money; and their object appeared to be not to help the provinces, but to accumulate an inordinate sum of money for the benefit of their metropolitan members. A conviction was easily to be obtained. Let them send down an independent detective to obtain the suspected article, and take it for examination to the borough analysts, whose certificate would become evidence, and, in the absence of contradictory evidence, would leave the "justices of the peace" no option but to inflict the penalty, not exceeding £5 and costs. The remedy, he contended, was provided by "clause 24 of the Pharmacy Act, 1868," in which were incorporated the provisions of "An Act for Preventing the Adulteration of Food or Drink," 23 & 24 Victoria, clause 84. In conclusion, he trusted that the new Council of the Pharmaceutical Society would manifest some interest in this subject of provincial education, and that they would also do something in the direction to which he had drawn attention, so that the Pharmacy Act should (in that district) no longer be looked upon as obsolete and inoperative; then, and not until then, did he expect to see the chemists of Sheffield taking a satisfactory interest in the various objects for which this association had been established; he begged most heartily to move:—

"That this meeting, having considered the educational and scientific requirements of the Pharmacy Act, is deeply impressed with the necessity that exists for the maintenance of Chemists' Associations in the provinces, to afford facilities for the proper training of assistants and apprentices, so as to enable them in due time to pass the examinations of the Pharmaceutical Society. This meeting feels it would be a serious inconvenience to those in business in the provinces, as well as a harassing pecuniary burden to the young men themselves, if all were under the necessity, at the close of their apprenticeship, of spending several months in attending the Metropolitan School. Whilst this meeting fully appreciates the efforts that have been made by provincial associations, yet from its own experience, as well as from the testimony of others, it is convinced that the object aimed at cannot be fully attained without assistance of a subsidiary kind, for a few years at least. Considering the large amount of money, in the aggregate, contributed by the country members, associates, and apprentices to the funds of the parent Society, and also having had brought before it the balance sheet of the Pharmaceutical Society (as given at the last Annual Meeting in London), showing that in addition to its large funded property, and after a gift of £500 to the Benevolent Fund, it had still in hand a surplus of upwards of £1100, this meeting is of opinion that the legitimate source of aid in this crisis is the executive in London. This meeting having had placed before it the correspondence which has passed between their Secretary and the Council in London is very much concerned to observe the absence of sympathy, and the absolute refusal to render any pecuniary aid to provincial associations. This meeting is cognizant that a deep feeling of dissatisfaction exists on this matter, and is convinced a serious antagonism will be engendered if the case is not met in a reasonable manner."

Mr. G. A. Cubley, in seconding the resolution, said, that it was a monetary question with employers, assistants, and apprentices. The effect must be the over-stocking of the London shops with assistants, who would be wishful to have their education at the Metropolitan School, being debarred from gaining it elsewhere, and, as a consequence, their labours must meet with a comparatively low recompense; on the other hand, provincial employers would be robbed of that choice which, under more favourable circumstances, they could have. Other undesirable consequences would follow.

Put and carried.

Mr. W. Ward, F.C.S. moved the following resolution, which was passed unanimously:—"That this meeting heartily approves of the action recently taken by the President, to ascertain the opinion of kindred associations, and hereby nominates and appoints him to attend a meeting of delegates to confer on this subject, such a meeting being deemed most advisable." Mr. Ward, in the course of his remarks, showed that the time had fully arrived for taking steps to obtain pecuniary aid from the Council of the Pharmaceutical Society. He considered they had a right to ask for this assistance, for it was well known that the country members contributed large sums annually, which went to swell the accumulated funds of the Society, and give increased facilities in the school at Bloomsbury Square. He, for one, supported with all his heart the machinery at work in London for the training of students; but he did not think it just that so much should be devoted to that establishment, and little or nothing to the provinces. A great deal was said against the system of "cramming," but how was it possible to avoid this evil if the students in the provinces had not the means of obtaining *gradatim*, that scientific knowledge which would enable them to pass the examinations? It was a fact that large numbers went up to London comparatively ignorant of their business, but, by the greatly to be deplored help of the "grinders," succeeded in satisfying the examiners. Personally he felt very strongly on the question of pharmaceutical education in other schools, apart from the one in Bloomsbury Square; having passed through the curriculum of a student's career, he had experienced a great loss in not having the assistance of a complete course of lectures in his own town. He felt confident the Council would ere long be brought to recognize their great need, and would take steps whereby to ascertain the requirements of the local associations, and thus give them that aid he was sure they were entitled to.

Mr. C. H. Dunnill, in seconding the resolution, pointed out the expense to which he would have been put, had he been obliged to attend the lectures in London instead of being enabled to attend those furnished at the Sheffield School.

This resolution was put and carried.

Mr. Dobb, Ex-President, then proposed the next resolution, which was seconded by Mr. J. Preston, and carried:—

"That this meeting feels the necessity of Sheffield having a representative on the Council of the Pharmaceutical Society, and hereby nominates Mr. W. V. Radley, with the request that he will kindly consent to stand for the ensuing election; this meeting determines to support his election."

Mr. Radley, in rising, thanked the meeting for a renewal of their confidence, and promised, if returned, to do his utmost to forward the interest of the trade.

On Wednesday evening, at the ordinary monthly meeting, Dr. Young delivered a lecture on "Pharmacy," in connection with the above Association. Mr. Radley, the President, occupied the chair. At the close, the lecturer, who treated his subject in a most able and interesting manner, was awarded a very hearty vote of thanks.

Mr. Edwin Watson was duly elected an Associate.

The 'Year-Book of Pharmacy and Transactions of the British Pharmaceutical Conference' lay upon the table, and was ordered to be acknowledged with thanks.

Proceedings of Scientific Societies.

THE ROYAL SOCIETY, EDINBURGH.

The Eighth Ordinary Meeting of this Society for the present session was held on Monday evening, 18th current; Professor KELLAND in the chair.

Professor BALFOUR read a notice of the fruiting of the ipecacuanha plant in the Edinburgh Royal Botanic Garden. The learned Professor explained that the cultivation of this plant had received an impetus from the encouragement given by the India Office to its introduction into India, where it is of great value as a remedy for dysentery. There had been despatched from this country two hundred and seventy-seven specimens. The plants had been forwarded to different parts of India, and there was every reason to hope that the experiment would prove successful. Passing on to speak of the plants in the Botanic Garden, the Professor stated that one which had been there for a long time had flowered regularly, while one obtained more recently from Rio Janeiro had not yet put forth a flower, although it had that morning shown some symptoms of doing so. By manipulating the blossoms of the flowering plant, it had latterly been got to produce fruit. It could also be readily propagated by means of cuttings from the root.

PHILADELPHIA COLLEGE OF PHARMACY.

At the Pharmaceutical Meeting held on February 20th, under the presidency of Dr. PILE, several interesting specimens were exhibited.

Professor PARRISH exhibited some annatto seed from Pará, said to be used for obtaining a finer tint of colour than that which is produced by annatto.

Professor MAISCH exhibited specimens of syrup of senega and syrup of ipecac, prepared by Mr. J. B. Moore from his formulæ (published in *American Journal of Pharmacy*, March, May and July, 1870), which had been kept for over sixteen months; also syrup of orange flowers, prepared of double the strength of the officinal syrup; also from George W. Kennedy, of Pottsville, Pennsylvania, mistura cretæ, having the sugar replaced by glycerine, and kept for ten months. Mucilage of gum arabic was also exhibited by the Professor, made by him in 1870, in which half the water was replaced by glycerine (see Mr. Rother's paper, on page 768 of the present number). This mucilage had been made for certain investigations which have not been finished.

Professor PARRISH exhibited to the meeting camphor in the state of powder, prepared by Mr. C. H. Heinitsh last October by sublimation, as proposed by Mr. Lowd. It was still in a pulverulent condition, and consisted of very minute crystals.

Professor PROCTER presented a specimen of the oil of the liver of the sun-fish, prepared by Mr. Marvin (manufacturer of cod-liver oil) at Portsmouth, N. H. This oil has a bright orange-yellow colour, an odour differing from cod-liver oil, and was prepared in the same manner as cod-liver oil. Nothing is known of its medicinal properties. This fish is the *Tetraodon mola*, a species of ostracion described in the tenth volume of Cuvier's work (Pisces).

Professor PROCTER now exhibited some specimens of organic principles, made by Prof. E. S. Wayne, of Cincinnati. These were—hydrastin, from *Hydrastis Canadensis;* sulphate of berberina, from the same plant; marrubin, the bitter principle of horehound; phloridzin, from apple-tree bark; xanthoxylin, from the bark of *Xanthoxylum fraxineum,* and celastrin, from *Celastrus scandens*. The celastrin, which now for the first time is noticed, is in perfectly white crystalline masses of minute crystals like chloral hydrate.

Professor MAISCH exhibited cinnamic acid and styracin of various degrees of purity, obtained from liquid storax. Styracin may be readily obtained in tufts of snow-white needles, by crystallizing it from petroleum benzine. He likewise showed some bibromide of camphor, $C_{20}H_{16}O_2Br_2$, discovered by Laurent in 1840, and monobromated camphor, $C_{20}H_{15}BrO_2$, discovered by Swartz in 1862, and lately recommended by Prof. Deneffe as a sedative for the nervous system. (See PHARM. JOURN. *ante*, p. 529.) In attempting to make this new therapeutic agent on a somewhat larger scale, an explosion took place while the closed vessel was kept in boiling water, in consequence of the pressure exerted by the confined vapours of hydrobromic acid, uncombined bromine and camphor. Suitable precautions having been taken in anticipation of such a possibility, no injury was sustained. The monobromized camphor resembles Borneo camphor in odour.

Professor BRIDGES said it afforded him much pleasure to call the attention of the meeting to a new industry in the United States, the manufacture of phosphorus, by Messrs. Rose and Lowell, of Rancocas, Burlington County, New Jersey. The bottle on the table, marked Jan., 1872, was believed to contain the first stick of phosphorus cast in America, and presented a handsome appearance. Dr. Pile remarked that Mr. Rose had informed him in conversation that it was made from spent bone-black from the sugar refineries, and pays a profit at the market rates. The manufacturers are already able to supply it in large quantities.

In calling the attention of the meeting to the recent veto of the Pharmaceutical Bill by the Governor, Professor PARRISH rehearsed the history of the Bill in detail, from its origin. It was prepared by a committee in consequence of the demands made by the public press, endorsed by the druggists of Philadelphia met in convention, adopted by both houses of the Legislature, and now vetoed by the Governor, who, from the objections as reported in the papers, must have been much deceived in the character and effect of the Bill. The objections were commented upon, and in conclusion Professor Parrish asserted that the profession much needed the protection of such a law to give character and standing to it, and the public also needed it for their protection.

Dr. ROGERS said that pharmacists were emphatically on the same platform with the physician; without skilfully prepared remedies, the physician's art would be, indeed, very much crippled. Physicians should stand by the pharmacists and demand the passage of this Bill. They needed competent persons to dispense their prescriptions, and were well assured that accidents rarely happen with the educated pharmacist.

Professor ROGERS referred to the outrageous frauds recently discovered in the sale of medical diplomas. He said that the trade had been going on for some time, and only recently the profession and public had found it out. The parties had been until then adroit enough to cover their tracks, but occasional correspondence had brought it to light. Without the participation of the faculty, the press took it up and forced it upon the attention of the Legislature. A committee of investigation had been appointed, and the faculty of the University of Pennsylvania were summoned to testify before it. The investigation threatening the culprits, they had not attempted to defend their case, but attempted a flank movement and attack upon the University of Pennsylvania. The Doctor explained the careful mode of printing diplomas, and the impossibility of their falling into the hands of those who would make fraudulent use of them. The charge of their over-issue was a mere invention, entirely unsupported by evidence. The medical schools known as the Philadelphia University of Medicine and Surgery (Paine's), the American University of Philadelphia and the Eclectic Medical College (Buchanan's)—pretended to have competent rules for governing them; but it was proved that they had not lived up to them in any particular. He hoped for legislative action to relieve the public from this imposition, practised not only in the United States, but over Europe. The name University of Philadelphia is frequently confounded with University of Pennsylvania (*at* Philadelphia), and favours the system of deception complained of.

Professor BRIDGES remarked that in Europe, where medical practitioners were licensed, many had applied, having these diplomas, who had never been out of their own country.

Parliamentary and Law Proceedings.

ALLEGED MANSLAUGHTER BY A CHEMIST.

DEVON LENT ASSIZE—CROWN COURT, *March* 15*th*.

Before Mr. Baron BRAMWELL.

Robert William Webber (on bail), a young man respectably connected, was indicted for the manslaughter of Mr. Wm. Ellis Wall, of Salcombe Regis, on the 22nd of July, 1871. Mr. Clark and Mr. Mortimer prosecuted (instructed by Mr. Stamp); Mr. Cole, Q.C., and Mr. Carter defended the prisoner (instructed by Mr. Tweed); and Mr. Collins watched the case on behalf of the widow.

Mr. Clark opened the case for the prosecution. He said,—The prisoner, as you have heard, is charged with the manslaughter of William Ellis Wall, and I appear on behalf of the Crown, with my friend Mr. Mortimer, to conduct the charge against him. I need hardly remind you of the serious nature of the crime under investigation. The manslaughter charged in this case is that of gross negligence in the preparation of a prescription, in consequence of which Mr. Wall came by his death. The facts are briefly these:—It seems that the prisoner at the bar is a brother of Charles Farrant Webber, a chemist, carrying on business at Sidmouth; and the deceased was a gentleman living in independent circumstances at Salcombe Regis, near Sidmouth. Mr. Wall had, I believe, studied medicine for some little time, and he was in the habit of making up prescriptions. It seems that Charles Farrant Webber, the chemist, being unwell, went away for change of air, leaving the prisoner, his brother, in charge of the shop. The prisoner, I believe, was not on the register as a chemist, but it seems that he had assisted his brother before in a chemist's shop, and had a sufficient knowledge of chemistry, I assume, to be allowed to carry on the business of the shop. On the 22nd of July last, Mr. Wall sent Jane Shepherd, his servant, to Mr. Webber's shop with a prescription which he had written out. He sent her away, I am instructed, at two o'clock. I need only say now in passing that the prescription sent by Mr. Wall, if properly made up, would prove simply a composing draught, but as made up by the prisoner it was certain death; any one who took it must have died. The prescription, as I have said, was taken to Mr. Webber's shop by Jane Shepherd, and she requested that the medicine might be made up and sent to Mr. Wall's. The medicine was not sent, and Jane Shepherd went again to Mr. Webber's at half-past nine in the evening. She then saw the prisoner, and asked if the medicine was ready. He said it was not, and then made up the prescription in her presence, putting the mixture in a bottle, which he folded in paper and handed to her. She took the bottle straight to Mr. Wall's house, and gave it, I think, to Susan Osler. The bottle, I should have told you, had a label on it, "To be shaken." Susan Osler, immediately she received the bottle containing the medicine, delivered it to Mrs. Wall; and Mrs. Wall, as soon as she possibly could, took it to her husband and gave him half the contents of it, according to the directions written on it. Almost immediately after the medicine was taken, it seems, the prisoner sent a message to Mr. Wall's by a boy called Pim, stating that the wrong medicine had been sent, that he had forwarded another bottle, and requesting that the medicine he sent in the former bottle might be returned, as a mistake had been made. Dr. Atkins, it seems, happened to be in the shop when the prisoner discovered his error, and he told the doctor that he had made a mistake and had put a scruple of morphia in the mixture. Unfortunately the boy arrived at Mr. Wall's too late. Mr. Wall had taken the medicine given to him by his wife, and he was already exhibiting symptoms which, as she said, were unusual; in fact, he was in precisely such a state as would be produced by his having taken a strong dose of poison. It was fair to the prisoner to say that immediately after he discovered his mistake he sent for Dr. Mackenzie, the deceased's regular attendant, who arrived in a very short time. Dr. Atkins also arrived about the same time; and it was again only fair to say that, at the prisoner's earnest request, Dr. Hodge was also sent for, and he came at once. Every possible remedy was applied to restore the unfortunate man, but, in spite of the utmost care and attention, Mr. Wall died between two and three o'clock on the following morning. There is no doubt in this case that the cause of death was an overdose of opium; and I think there will be no doubt in your minds, for I shall prove it conclusively, that Mr. Wall came by his death by the act of the prisoner. The question you will have to try, therefore, will be this: Was there such negligence, such very gross negligence, in the conduct of the prisoner as to make him responsible—criminally responsible—for what he did? In other words, was he guilty of culpable negligence? I will, in the first place, call your attention to the prescription. I have told you that the prescription, if properly prepared, would have supplied an ordinary composing draught; but the medicine made up by the prisoner contained, no doubt, what would have produced certain death, if taken. The mistake made by the prisoner was this: that he misread the prescription, and consequently, as the medical men will tell you, he used the salt muriate of morphia, one scruple, instead of the solution of morphia, half a drachm—that is, he used a powder instead of a liquid.

His Lordship: Tell me that again. You say he misread the prescription.

Mr. Clark: Yes, he misread "sal" for "sol."

Mr. Cole: That is the whole negligence.

Mr. Clark, in continuation, said the prisoner admitted that he put in a scruple of morphia in the medicine, and consequently the mixture he compounded was eighty times stronger than that prescribed according to his own admission. But the medical men would tell the jury that had he put in the quantity named in the prescription he would have put in 30 grains ($1\frac{1}{2}$ scruples), which would have made the mixture 120 times stronger than that prescribed.

His Lordship (referring to the prescription): What do these signs at the end mean? Do they indicate weights merely?

Mr. Clark: Yes.

His Lordship: Are they equally applicable to liquids and solids?

Mr. Clark: Yes, my lord; but perhaps that is more a question for the medical men. Proceeding with his address to the jury, the learned counsel said: Having called your attention to the prescription, and the manner in which the prisoner dealt with it, I will briefly point out to you the negligence that we impute to him. The prescription was in the shop all day; the prisoner being in charge of the shop all day. The prisoner, being in charge of the shop, assumed to be a competent man, or his brother would not have left him in charge. Assuming the position he did, he undertook to be competent; and the prosecution say that in this case he exhibited an incompetence which showed on his part great ignorance or great carelessness indeed. The prescription was there all day, and he had full opportunity of seeing it. Remember, it was left there from two o'clock to half-past nine. So that he had ample opportunity of studying it. Then the largeness of the dose ought to have attracted his attention, and made him more careful. Then again there was the direction to shake the bottle. Now, if he had used the solution, no shaking would have been required; why, therefore, should he put the label on the bottle "to be shaken?" Another matter for your notice is, that he gave no caution to the person who took the medicine away as to the magnitude of the dose, and the colour being the same as if it had been correctly prepared, no suspicion would be raised in the mind of the patient who took it. Another material point was this: the prisoner put a notice on the bottle, "One-half to be taken," so that his attention must, at the same time, have been called to the large amount of morphia that would be taken. If the prosecution had to allege further evidence of negligence, I think I am entitled to say this, that it was not until he applied his mind to the prescription, directly after he had made it up, that he found out he had made up a dose of a dangerous character. After the prisoner discovered his mistake, no doubt he did all he could. He sent for Dr. Mackenzie to go and see the deceased; he sent Dr. Atkins, and he sent the boy with another bottle containing the proper medicine. But all this was after he had made the fatal mistake. That, gentlemen, is briefly the case I have to lay before you on behalf of the prosecution. I shall endeavour as far as I can, in conducting this case, to bring out all the facts, which are few and simple. When you have heard the witnesses whom I shall call, I shall ask you to return, as I have already said, such a verdict as commends itself to your judgment, and as you believe in your consciences to be right and proper.

The learned counsel called witnesses, who deposed to the facts opened.

Mr. Cole, in addressing the jury for the prisoner, said,—There was no doubt the unfortunate gentleman lost his life through a mistake made by the prisoner. There was no dispute about the facts. It was a sad mistake, but it would, on the other hand, be very sad if a young man were to be convicted of this serious criminal offence for what, he should submit, was merely a mistake. Before the jury could find the prisoner guilty of manslaughter, they must be satisfied that he had been guilty of gross and criminal negligence, and could they say that in this case that had been made out? Let them look at the facts. The prescription sent to the prisoner to be made up was not written by an ordinary medical man, and was not written in the ordinary or proper language. The word "sol," from which the whole mistake arose, was an improper phrase, and it was through this that the fatal blunder arose. The unfortunate deceased had, therefore, conduced to his own death by the manner in which the prescription was written. It was a sad thing in these days of common sense that medical men would write ther prescriptions in this dog Latin, where the mistaking a single letter might, as in this case, cause the loss of a life. It was time this sort of thing was got rid of. It was, in short, a wonder that more lives were not lost through this stupid and wretched practice, which was adopted by educated gentlemen without any earthly purpose being served by it. If he had anything to do with legislation, he would make it criminal for any medical gentleman to use this dog Latin, and every one should be bound to write his prescriptions in good common Saxon English. The subject, he hoped, would be taken up, and this system of quackery and mystery put an end to. The prisoner, the learned counsel went on to contend, was perfectly competent to compound drugs, but he did not think it was fair to make him responsible for a knowledge of the effects of any prescription which he might make up. He did not at all agree in the proposition that the prisoner ought to have known that the dose which he made up was a fatal one; and it would be idle and undesirable to expect chemists and their assistants to know the effects of everything they made up. Doctors would have a common knowledge on this matter, which chemists could not. When the prisoner found out through Dr. Atkins that he had given an overdose, he did everything he could to remedy his mistake, and he submitted there was no evidence of such criminal negligence as would make this young man liable. It was laid down by Lord Ellenborough that to substantiate a charge of manslaughter the prisoner must have been guilty of criminal misconduct, arising either from the grossest ignorance or the most criminal inattention. Of course it would be for the jury in the case to say whether gross ignorance or criminal or felonious inattention had been brought home to the accused, but he respectfully submitted that it had not. The fact that the prisoner had been tempted to destroy the prescription and the bottle, and had refused, negatived the proposition of any felonious misconduct, for if he had destroyed them he could not have been convicted of any offence, whatever suspicion might have attached to him. The learned counsel, in continuation, asked for an acquittal, and observed that the prisoner felt most deeply the affliction which he had brought on the lady who had that day appeared in the witness box. Remorse for his fatal mistake he must ever feel; but he asked them not to add to an already sufficient punishment for that mistake by finding a verdict against him.

His Lordship, in summing up the case, said the prisoner was proved to have caused the death of the deceased by having misread the prescription, and put up a dose of medicine strong enough to kill three or four times over; and the question for the jury was whether his conduct was such as to make him the proper object of punishment. They could not find him guilty unless they were satisfied that the death of Mr. Wall was caused by criminal ignorance, or negligence, or a combination of both. If they found that the mistake he made was one which might happen to any ordinarily careful person, without its being an imputation upon his good character for carefulness, or that it resulted from a certain extent of ignorance, but not such as to make it criminal, they would not find him guilty. It was impossible to say what was the precise difference between negligence and ignorance that was criminal and that which was not. All that could be done was to leave the matter for the jury to apply their good sense to it. If they felt that the ignorance or negligence displayed, or both combined, was venial, and not such as called for punishment, they ought to acquit the prisoner; but if his conduct was such as ought to be punished, even if it had not resulted in Mr. Wall's death, then they would find him guilty. He might illustrate what he had said in many ways, but he could give them no other definition of the term "culpable negligence." It was not enough that a man displayed some degree of ignorance, something short of perfect knowledge. That would be to say that a man should be punished for being a man. No human being was perfect either in knowledge or in care. Therefore there was a certain amount of want of knowledge and care which was not punishable; and before they convicted the prisoner they must be satisfied that such an amount had been exhibited as in their consciences they felt to be culpable and criminal and deserving of punishment. The mistake the prisoner seemed to have made was this: That he read the word or syllable "sol" as though it were "sal." That was the first thing he did. He (the learned Judge) did certainly concur most heartily with what Mr. Cole said as to the impropriety of gentlemen writing these important documents in the slovenly way they did. I should be heartily glad, he said, if they could be made to write them in legible English, and at full length. The only way I can account for the present practice is that doctors do much the same thing as certain members of our profession do, who write illegible opinions, when probably the motive at bottom is that people should suppose they have so much to do that they have no time to write carefully; for certainly, next to doctors' prescriptions, lawyers' opinions are the most illegible things written. He (the learned Judge) did not say that to raise a laugh, but for another reason. If the deceased had written the prescription in question for a patient, and the same mistake had been made, he might himself have stood in the dock to answer a charge of manslaughter for having written it in such a way as to cause a poison to be made up. But it did not follow, because the deceased was to blame, the prisoner was not. As he had said, the mistake the prisoner made was in reading "sal" for "sol." He (the Judge) should have thought it was obviously "sol." But it must be borne in mind that the modern mode of writing "sol." was to write "liquor." He could not, therefore, help thinking that the word "sol.," written instead of "liquor," misled the prisoner; for not only might he have read it as "sal" in itself, but inasmuch as "sol." was not the proper word to use, he was tempted into reading it as "sal." Now, if a dose made up of a scruple of the salt muriate of morphia had been a dose that a man could possibly take, the prisoner's mistake would have been excusable. In other words, if half a drachm of the solution would have been good for one complaint and half a drachm of the salt would be good for another complaint, the man would have made an excusable mistake, into which he had been tempted by the person who wrote the prescription. But when it was borne in mind that half a drachm of the solution was a proper dose for a certain complaint, but that half a drachm of salt was three times over a fatal dose, and therefore a dose which no one could have prescribed, then the prisoner was put in a dilemna. Either he knew what he put up was a fatal dose, or he did not know it. If he did not know it, he failed to bring that common knowledge to the discharge of his duty as a chemist which he ought to have brought; and before he undertook to meddle with these deadly poisons, he ought to have acquired the rudimentary knowledge that would have taught him that half a drachm of the salt would certainly poison a man. But if he did know the deadly character of the drug,—and it was manifest that he did, because he found out the mistake himself, and, with one exception, did his best to remedy it,—he was placed on the other horn of the dilemna, viz. that he had no justification for misreading the prescription, if he was aware that half a drachm of the salt would necessarily be a fatal dose. The way in which the prosecution put the case was this, either you knew it, or you did not. If you did not, your meddling with deadly drugs was a culpable and criminal act on your part; if you did know, then your putting up a preparation for a man which would poison him three times over, if he took the quantity stated on the bottle, was a criminal piece of negligence, and a criminal misreading of the prescription. That would possibly answer the case put by Mr. Cole. No doubt if Sir William Jenner had, in plain, legible writing described the salt, it would have been rather a bold thing for a chemist to have refused to make it up; but if he (the Judge) were a chemist, and thought in his conscience that Sir William Jenner had made a mistake, he would not have made the prescription up, because he should have known that the consequences would have been fatal. The point was that if the writing were clear and legible, the chemist might be excused for saying, "Sir William Jenner knows better than I do;" and so the prisoner might have been excused for saying, "Mr. Wall knows better than I do." But the difficulty was this—assuming "sal" to have been badly written, and that he was invited, as it were, to make a mistake, yet, knowing that it was a fatal dose, he ought to have looked carefully and made himself quite sure that he was reading the word correctly when he read "sal" for "sol." If the jury believed that prisoner caused the death of Mr. Wall by criminal ignorance—for which there was no pretence—or through criminal inattention in misreading the prescription, they ought to find him guilty. As he had said before, if either "sal" or "sol." would have been a proper medicine, it would be difficult to say he was to be blamed for making the mistake; but it must be recollected that while "sol." was an innocent dose, "sal" was a fatal one. His Lordship next commented on the prisoner's conduct after he discovered he had made up the wrong medicine. In one respect his conduct was most praiseworthy. Considering the temptation there was to destroy the prescription, which would have made it difficult to establish the case, it was most creditable to him that he resisted that temptation. It was manifest that, with one exception, he did his very best to rectify the mistake he made. But there was a matter to which Mr. Clark very properly called their attention. When prisoner found out his mistake, he ought at once to have rushed off—leaving the shop to take care of itself, or be plundered even—to endeavour to prevent the unfortunate man taking the dose he had prepared. But he did not. He first made another mixture, then found the boy Pim, and sent him with it, and remained behind to mind the shop. It was his duty, as soon as he found out his mistake, to have immediately done all he could to obviate its consequences; so that, even if the jury believed he was not criminally negligent in making up the medicine, and yet thought he did not do his best to prevent the deceased taking it, they would, in his opinion, be obliged to find him guilty.

The jury, after nearly two hours' absence, returned a verdict of "Not Guilty."

The Keeping of Poisons.—Attempt to Poison by Tartar Emetic.

On Tuesday, March 12th, Walter Thompson, 16, was charged at the Clerkenwell Police Court with feloniously attempting to poison the Rev. C. A. W. Reade, late curate of Skeyton, near Norfolk, and his family.

The Rev. Complainant said: I am a clergyman of the Church of England. The prisoner had been in my service as page for some time. I dismissed him summarily on Tuesday last for some improper practices that had come to my knowledge, and told him he would have to go home by the seven o'clock train the following morning. On Wednesday morning I got up at six o'clock and accompanied him to Tottenham, where I gave him his third-class ticket, and also money to take him home by cart. On my return home that day, about two o'clock, my wife opened the door, and said, "Oh, I hope you have not taken any brandy." I said, "No; why?" And she said, "Because Elizabeth, the cook, says it is poisoned by Walter." My wife then brought me the brandy bottle, and it looked very muddy. Prior to this it was clear, like ordinary brandy. After dinner I went up to my dressing-room, where I keep thirty or forty kinds of medicine, it having struck me that the prisoner might have used some of the poisons that were there. I looked over them carefully, and found that the one containing tartarized antimony or tartar emetic had been tampered with. I noticed that some had been taken out, some of the flour being on the edge of the bottle and the cork half in. I sent for a police-constable, and showed him the state of the bottles, and in the evening I took the brandy bottle to a surgeon, and asked him to analyse the contents for antimony. He did so, and the result of the test was that antimony was found. The brandy bottle was kept in a drawer on the sideboard with other spirits. It was always unlocked, and, the key being lost, it was open to any one. The medicines were open on the chimney-shelf in my dressing-room.

The Magistrate: Do you say that you leave the poisons open to any one to tamper with?

Witness: Yes; but no one has touched the bottles before.

Can you say about how much of the poison has been taken out of the bottle?—I should say that there was about half an ounce.

A cook in the employ of the prosecutor gave evidence in reference to some threats that the prisoner had spoken in her hearing against her master.

The prisoner made no defence, and was remanded.

A Child accidentally Poisoned.

The Liverpool Borough Coroner held an inquest on Monday upon the body of a male child, fourteen days old, the son of Robert Stirling Iddeson, a clerk at the General Post-office, who lives at 283, Upper Parliament Street. It appeared that on the 13th inst. the deceased was suffering from flatulency, and Dr. Bailey, who was attending upon Mrs. Iddeson, ordered that doses of dill-water should be administered. That same evening Mrs. Iddeson sent the servant to a druggist's shop (kept by a Mr. Cantrell) in the neighbourhood, for a pennyworth of the medicine prescribed. She returned with a bottle, a teaspoonful of the contents of which was administered to the deceased at about 11 o'clock. The child sank quietly to sleep immediately after taking the dose, and about half an hour afterwards began to breathe heavily, and turned quite black in the face. Dr. Bailey was sent for, and he, finding the deceased in convulsions, prescribed accordingly. He subsequently returned, about noon on the following day, when he concluded that the deceased was suffering from narcotic poisoning, and galvanism was applied, but the child could not be roused from the lethargic state into which he had fallen, and died before the day was over.

Dr. Somers concurred with Dr. Bailey in the opinion that the deceased had died from a narcotic poison. The latter gentleman said that when he first examined the bottle which had been brought from the druggist's, soon after the dose was administered, it smelt of dill-water, but when he tried it some time afterwards that smell had passed away. There were two labels on the bottle, one over the other, one bearing the word "Nepenthe" and the other "Dill-water." If the bottle had previously contained nepenthe, although it might have been dry when the dill-water was put into it, the latter would dissolve the nepenthe encrusted on the sides, and a mixture would be formed which would be sufficient to poison the deceased.

Elizabeth Jones, the servant who was sent for the medicine, said the bottle she took to Mr. Cantrell's shop was quite clean, and without any label upon it. She also believed it was a little larger than the one produced. The shop was in great confusion at the time, Mr. Cantrell having only just changed his place of business.

A woman who was present when the servant was sent for the dill-water, said that Mrs. Iddeson smelt at the bottle before giving it to the girl, and remarked that there had been peppermint in it. That bottle was larger than the one produced, and had no label on it.

Dr. Brown, from the Royal Infirmary, said he had analysed the liquid in the bottle, and found that it contained two per cent. of opium. The mixture altogether was about two-fifths of the strength of laudanum.

Mr. William Cantrell, the gentleman who supplied the dill-water, said that when the servant asked for it, he noticed that the bottle she presented had a label upon it, marked "Nepenthe," and he also noticed that the bottle was somewhat soiled, as if from disuse. The servant, however, assured him that it was quite clean, and, on the strength of that assertion, he supplied her with the dill-water, although he perceived, after he had put the liquor into it, that the whole became slightly tinged with a light brown colour. It was no part of his duty, or the duty of any chemist, to wash the bottles that were presented for the reception of drugs, and he felt satisfied from the assurance of the servant, that the bottle had been cleaned and prepared to receive the dill-water.

The jury, in returning a verdict of "died from an opiate poison administered in mistake for a prescribed medicine called dill-water," presented "that they considered the chemist had used a dirty bottle (not being the one taken to him) which had at some time contained an opiate, and that the remains or deposit of such opiate had caused the dill-water sold to be discoloured and affected so as to contain two per cent. of opium. They attribute the use of the old bottle by the chemist to the hurry and confusion consequent upon the recent removal of his business; and, whilst considering him open to remark for this want of caution, they would suggest that the practice of using old bottles uncleaned should be discontinued altogether."

Poisoning by Vermin Killer.

On Friday, March 8th, an inquest was held at the Board Room, Mount Street, Grosvenor Square, on the body of Charles Thompson, aged thirty-nine, who committed suicide by taking vermin powder, at No. 26, Robert Street, under the following circumstances:—The deceased lodged at the above address, and at half-past eight Mrs. Godly, the landlady, took up a letter, which she pushed under the door. Within an hour after he called out for assistance and asked for a doctor. He said he had taken some vermin killer, and before medical aid could be procured life was extinct. Dr. W. Bloxam said the cause of death was poisoning by strychnia. Evidence was then given showing that deceased had lost money at the Stockton steeple races, that he was worried very much about three illegitimate children, also that he was interested in the Tichborne bonds, and it is supposed that the letter given to him contained information of the foreman's intimation on the previous day, the effect of which caused him to commit the act. Verdict, "Suicide while in an unsound state of mind, brought on by an accumulation of misfortunes."

Review.

Inorganic Chemistry. By the late George Wilson, M.D., F.R.S.E. Revised and enlarged by H. G. Madan, M.A.

'Wilson's Chemistry' revised is more acceptable than 'Wilson's Chemistry' enlarged. In 1858, two hundred and sixty pages sufficed for the statement of the fundamental laws of chemistry and a description of the more remarkable inorganic compounds; in 1871, just twice two hundred and sixty are considered to be necessary for the purpose. Seventy pages served Wilson for the chemistry of the metals; one hundred and fifty are occupied by the metallic elements in the present edition. And yet when we come to examine into the character of the additions, we are not less pleased with them than with the alterations. The authoress of a memoir of George Wilson tells us that this text-book was written to dictation by a sister in the summer of 1849, in the "Sleepy Hollow" of Morningside. Continued illness compelled the abandonment of the professor's spring classes, and a volume for 'Chambers's Educational Course' was undertaken as the only work of which he was capable at the time, idleness being to him an impossibility. He was quite unable to hold a pen for months, and dictated its pages while pacing the room, compressed lips indicating pain that could scarcely be endured. These circumstances may, perhaps, account for a certain amount of superficiality which characterized a work otherwise complete and charmingly written. Add to this that generalizations in chemistry have increased in extent and number, and chemical facts multiplied enormously in the past twenty years, and we have what we believe to be the true explanation of the thinness of the book in 1850 and its thickness in 1872.

One-third of the volume now published is devoted to fourteen chapters on the general principles of chemical philosophy, including chemical physics; one-third to a chapter on the non-metallic elements; and one-third to a chapter on the metals and their compounds. Organic chemistry, to which Wilson originally gave forty pages, is omitted altogether. The titles of the first fourteen chapters are:—Introduction, General Properties of Matter, Weight and Specific Weight, Crystallography, Heat, Light and Spectrum Analysis, Electricity, Chemical Affinity, Laws of Combining Proportion, The Atomic Theory, Chemical Nomenclature, Chemical Notation, Laws of Gaseous Volumes, Atomic Weights. About four hundred questions and exercises for home-students are given at the end of the book.

Chemistry cut down to the requirements of candidates for examination is but too characteristic of recent elementary works on the science, a fault not apparent in the book now under review. The volume has been brought well abreast of existing knowledge, the arrangement of its matter is clear, and it is well printed. Its nomenclature throughout may be illustrated by the names given to oil of vitriol, sulphuretted hydrogen and cream of tartar, these compounds being designated as hydric sulphate, hydric sulphide and hydric potassic tartrate. The employment of this system of names much impairs the usefulness of the volume to medical, pharmaceutical and other students of applied chemistry, but to the learner in general chemistry the book will be more popular than ever.

MEETINGS FOR THE ENSUING WEEK.

MONDAY.........*Medical Society*, at 8 P.M.
March 25. *London Institution*, at 4 P.M.—"Elementary Music." By Professor J. Ella.

TUESDAY ......*Royal Medical and Chirurgical Society*, at
March 26. 8.30 P.M.

SATURDAY......*Chemical Society*, at 8 P.M.—Anniversary.
March 30.

BOOKS RECEIVED.

MÉMOIRE SUR LA PANCRÉATINE: Étude de Chimie Physiologique. Par T. DEFRESNE, Pharmacien de Première Classe, ex-Interne des Hôpitaux, Lauréat de l'École de Pharmacie. Paris: Baillière et Fils. 1872.

ELEMENTARY TREATISE ON NATURAL PHILOSOPHY. By A. PRIVAT DESCHANEL. Translated and Edited, with extensive additions, by J. D. Everett, M.A., D.C.L., etc. In Four Parts. Part I.: Mechanics, Hydrostatics and Pneumatics, with 182 engravings; Part II.: Heat, with 152 engravings; Part III.: Electricity and Magnetism, with 242 engravings. London: Blackie and Son. 1872.

The following journals have been received:—The 'British Medical Journal,' Mar. 16; the 'Medical Times and Gazette,' Mar. 16; the 'Lancet,' Mar. 16; the Medical Press and Circular,' Mar. 20; 'Nature,' Mar. 16: the 'Chemical News,' Mar. 16; 'English Mechanic,' Mar. 15; 'Gardeners' Chronicle,' Mar. 16; the 'Grocer,' Mar. 16; the 'Journal of the Society of Arts,' Mar. 16; the 'Pharmacist' for January and February; the 'American Journal of Pharmacy' for March; the 'Chemist and Druggist' for March 15; the 'Grocery News,' March 15; the 'Philadelphia Medical and Surgical Reporter,' Nos. 775 to 777; 'Transactions of the Odontological Society' for February; the 'Wandsworth and Battersea District Times,' March 16; the 'Western Daily Mercury, March 16; the 'Liverpool Daily Albion,' March 19; the 'Liverpool Mercury,' March 19; the 'Liverpool Daily Courier,' March 19.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. Umney, Mr. Southall, Mr. Radley, Mr. Pocklington, Mr. Slugg, Mr. W. L. Scott, Mr. A. H. Mason, Mr. G. Delves, Mr. G. Ellers, W. F. R., Q. X.

We are compelled, by want of room, to defer the answers to some correspondents.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

"THE MYSTERIOUS COUNCILLOR."

Sir,—To my mortification I learn from many sources that I am credited with having written the disgraceful paragraph which appeared in the *Chemist and Druggist* of March 15th, under the above title. Let me therefore observe that I not only did not write it, but that I had not the remotest knowledge of its insertion, until in common with others I was disgusted by its appearance.

10, *Vigo Street, Regent Street, W.* JOSEPH INCE.
March 18*th*, 1872.

PHARMACY IN THE LABORATORY.

Sir,—"Commercially it pays to make many preparations, strictly pharmaceutical, and yet these are too frequently bought." These words from the pen of one of our most accomplished pharmacists deserve the careful consideration of those of us who may be called the lesser lights of our profession. A great deal may be written for and against the purchasing of ready-made Pharmacopœia preparations. In an establishment where an extensive dispensing trade is done, many assistants employed, and the principal is at liberty to attend personally and direct the operations of the laboratory, it *may* prove commercially advantageous to make some of the preparations; but not so in the majority of provincial pharmacies, where but one or two assistants are employed, and the master's time is fully occupied with the usual multitudinous affairs of the shop and attention to customers. Where apprentices are taken, it certainly behoves masters to see that their pupils receive a fair share of practical tuition: but this may be accomplished by a supply of experimental apparatus, and an allowance of extra time each week for the students' use.

The preparation of waters, extracts and the more complicated processes, requires an amount of practical knowledge which few retail chemists possess. I speak from an extended experience in some of the best manufacturing houses in the trade.

Mr. Haselden writes familiarly of 20-gallon stills, which he terms not very large, and Mr. Staples advocates the use of the kitchen boiler, without, I am afraid, considering Mrs. Housewife's virtuous indignation at the vile compounds introduced into her domestic apparatus. I have occasionally been favoured with an inspection of home-made extracts, waters and the like, but was never greatly impressed with their finish. Irrespective, however, of quality, I can confidently assert that most preparations can be bought as cheap or cheaper than made, after taking into consideration wear and tear of apparatus, labour, fuel, still licence, and loss in product by careless or ignorant manipulation.

How many pharmacists could undertake to make spt. ammon. aromat., spts. æther nit., linim. aconit. and belladonna, extract. ergot. liquid., conf. sennæ, succus scoparii, and taraxaci, equal in quality, or at as cheap a rate as they can be purchased from trustworthy London and Provincial wholesale manufacturing firms? Their successful manufacture requires expensive apparatus, and, as I said before, that *practical experience* which can only be obtained by daily familiarity with the workings of large quantities of substances, and not by an occasional acquaintance with *mere dribbles*, too often ending in *expensive muddles.*

In spite of Mr. Haselden's good intentions, few country chemists will be induced to lay in stock twenty-gallon stills, numerous evaporating dishes, and powerful presses, or to add the labours of a laboratory to those which already engross their attention, and keep them tied to their counters from early morning to bedtime; but will in all probability, like myself, content themselves with the practical pharmacy, illustrated by the preparation of tinctures, infusions, ointments, pills, compound powders, and the like, leaving extracts, distillates, granules, scales, alkaloids, chemicals, etc. to be made by those who make it their special branch and study.

Leominster, March 18*th*, 1872. M. J. ELLWOOD.

APPRENTICESHIP.

BY S. R. ATKINS.

I trust no apology is needed in again asking the members of the pharmaceutical body to give the question of apprenticeship their serious consideration.

So long as cases occur similar to that of 'Horner *v.* Pybus,' reported in page 695 of the Journal, so long are evils tolerated by us, working out results directly and indirectly most fatal to our progress.

The legalized defences erected around us, partly the result of our own seeking, and partly the result of public opinion, involve us in the higher moral law of privilege and responsibility—a law of universal application.

Our Society now has delegated to it by the Legislature, that is, by the nation, considerable powers touching the pharmacy of the country, and we cannot, if we would, shirk the stewardship we have sought and secured.

It is an undoubted fact that many of our apprentices are not equitably treated in this matter. A threefold barrier—or at any rate a twofold—in the form of examinations, has to be surmounted by the aspirant for pharmaceutical honours before he passes within the circle of privilege. He shares the maximum of responsibility, actually and prospectively, and in many cases only the minimum of present privilege in the shape of educational advantages.

There are ample grounds for asserting that chemists' apprentices are occupying, and it is to be feared will, for some time to come, occupy the least favoured position in our ranks.

Many men cannot educate their apprentices, while others will not, or at least do not. This is an evil existing in connection with pharmacy in Great Britain which can only be removed by creating a healthier sentiment through our own special literature. We hardly dare state the estimate which competent persons in different parts of the kingdom have formed as to the number of chemists who have accepted the responsibility of teaching, and are doing nothing of the kind.

The assertion that such apprentices occupy the least favoured position in our ranks is susceptible of the clearest and fullest demonstration.

Accepting the threefold division in its natural order,—Men in business, assistants, apprentices.

(*a.*) Of the first of these three this much may be said, the Pharmacy Act necessarily was called on to respect vested interests; whatever their defects, men in business were whitewashed. Evidently *they* have no ground of complaint; a better act of indemnity could not have been procured.

(*b.*) Assistants have much to complain of. Large numbers entered the trade when the higher culture demanded to-day was only indefinitely looming in the distant future. Their position seems to be this; they find themselves imperfectly trained in pharmacy and chemistry, and the path of life blocked by the examination ordeal ere they can enter the community of business men.

Per contra, however, this much is in their favour, the world lies before them. We do not mean the world outside the domain of pharmacy. Many young men are quitting us rather than confront the examiner; such a course if not a matter for surprise must be for regret. Is it for an instant to be imagined that the realm of pharmacy does not offer them all they want, only assuming they are willing to study? If one house of business denies them the requisite time and opportunity, other houses, willing to do so, are to be found.

(*c.*) With an apprentice the case is altogether different. For a term of years *his* position is fixed, and during its continuance, *nolens volens*, must be endured, unless the connection be severed by an illegal act, as in the case of 'Horner *v.* Pybus.'

The pertinent inquiry here suggests itself, What are the respective obligations mutually of master and pupil? A clear and definite statement of reciprocal duty must be made. We take it for granted that the Preliminary examination, or its equivalent, has been passed; to argue that such should be the case before the relation of teacher and student has commenced, assuredly must now be superfluous.

The master has a right to claim the honest, faithful discharge of duty from his apprentice. Granted. But what are the duties of an apprentice? In reply, it must be admitted, circumstances and localities will give a different complexion to those duties. It may be that sometimes the humbler work of "sweeping out," "shutting up," washing mortars and measures, running on errands in the occasional absence of the porter or errand-boy, may be fairly asked of the apprentice; and the youth who cannot let "such vile things come betwixt the the wind and his nobility" is not worth his salt. Not hesitating, on a push, to do such things themselves, no hardship would be inflicted by employers asking their pupils to do the same; and where just, honourable and kindly relations have been established, it will be so regarded. But will the most elastic interpretation of the covenant of indenture justify any man in immuring his apprentice three days out of six in a cellar four feet by ten, working by gaslight, grinding soda for a patent lubricating grease? On other days going from home to hold a vessel for hours "to catch condensed water," occasionally varied by dragging a hand-cart through the streets, or carrying out soda-water? Evidently a mistake has been made in a word: for *apprentice*, read *drudge*. This doubtless will be pronounced an extreme case, and, for the credit of pharmacy, we are thankful to believe it is,—but extreme in degree rather than in kind.

What are the just claims of a pharmaceutical apprentice? A comfortable home, gentlemanly treatment and sufficient technical training to enable him to pass the "Minor." That these claims are met, and even more than met, in a large number of instances, must be cheerfully conceded; but who can tell the number of cases precisely the converse? To what extent thoughtful, cultured men are declining the responsibilities of training, can only be approximately guessed,—personal observation on such a point, being necessarily limited, it forms but a partial datum on which to build an opinion. But information furnished from twelve centres in the most widely separated parts of England may be thus epitomized: "instruction furnished to apprentices lamentably deficient both in quality and quantity."

Let it not be said that such evidence is *ex parte*; that much, after all, depends on the "self-help" our young men put forth; that no generosity on the side of employers, no appliances furnished by institutions, can take the place of individual exertion. All this is admitted, and though it does not come within the scope of this paper to read homilies to our young men, still incidentally thus much may be said to them in order not to *seem* one-sided in our reasoning, first, that none of the efforts by others on their behalf for which we are contending can take the place of personal application; and further, that if the individual energy which resolves on achievement be put forth, many of the obstacles of life vanish into thin air.

Now what is to be done to meet this actual crying evil? A collection of the correspondence on the subject in the pages of the Journal would make a moderately-sized volume. The discussions at the annual meeting of the British Pharmaceutical Conference occupy no mean place in its Transactions. In some of our large centres of population, schools of pharmacy have been formed and are doing good work. Obviously, however, such remedial measures can only be partial in their application. By far the larger proportion of apprentices are placed in smaller towns, where combination for educational appliances is impracticable, and where the facilities, if found at all, must be found at home.

If these conclusions are the necessary and inevitable deductions from facts, then, amongst the *practical* questions affecting our interests, there is not one of deeper or more vital importance than that of apprenticeship.

After giving this subject the most patient and thoughtful consideration, I have arrived at the conclusion that the only remedy lies in the creation of a healthy moral sentiment by means of the press, *i. e.* our own literature more particularly. If some deem such a process slow, at least it is sure.

We must get to understand that the old *régime* of *laissez-faire* is a thing of the past, and that he who takes a youth into his house to train as a pharmacist accepts a trust, not simply from the parents or guardians of that youth, but in the interests of the public at large; that no man is warranted in taking an apprentice simply for the sake of premium, or of the work the youth can do. It must also be generally recognized that, mingling with the active duties of life, there must blend the scientific culture of educated men.

Such a healthy sentiment as we desire to see created and fostered, will prove a genuine *esprit de corps*, "a terror to evil-doers, but a praise to them that do well.'

Salisbury.

THE MICROSCOPE IN PHARMACY.

BY HENRY POCKLINGTON.

(*Continued from page* 702.)

We may conveniently, excluding the bark of the "above-ground stem," adhere somewhat loosely for the present to the first two divisions of our discourse. For, speaking generally, the structure of the very varied underground stems popularly known as roots is identical with the above-ground prolongations, called variously stem, stalk and trunk. Schleiden long ago pointed out that a knowledge of cell-structure and cell-life lay at the foundation of botanical science, and that it only ceased to be empirical in proportion as the acceptance of this truth increased. It is equally important that the analyst should become intimately acquainted with the nature and general morphology of those cells which constitute the plants of pharmacy. To the axiom that "all plants consist of a cell or cells," we add a rider, "whose form-elements are inseparable from their functions." With this in our minds, we will consider how best to become acquainted with the more minute morphology of plants in general.

I will assume that my readers are familiar with the meaning of the terms most frequently used in vegetable histology (those who are not will derive great assistance from either of Mr. M. C. Cooke's excellent manuals, his 'Structural Botany' or his 'Dictionary of Botanical Terms'). It is difficult, if not impossible, to give anything like an intelligible idea of the very varied forms of cells and their modifications without copious use of well-executed and carefully-printed woodcuts. I have therefore to content myself with a general notice of their principal forms, preliminary to giving directions relative to the best mode of studying their arrangement in the complex plant. The simplest form of cell is not unlike an egg or a grape in shape. The skin of the grape may be taken to represent the primary membrane of the cell, its pulpy contents to represent the protoplasmic contents of the cell, its living matter, and the seeds to very roughly represent the starch and chlorophyll granules often found in cells. An artificial grape, made of india-rubber, and furnished with removable envelopes, might be made to represent all, or nearly all, the varied cell-forms, from the nearly spherical one of pulpy fruits to the elongated duct of the vine and other "woods." A spiral of wire wound in the interior of such a cell would represent the spiral vessel, and perforations through all the coats of the cell but one would give a fair idea of porous cells or dotted ducts. So far as is necessary, I shall give the names and describe the forms or the varied modifications of cells as I come across them in my description of the structure of the various economic plants with which I am now concerned. But, before I do so, I think it desirable to take my readers through such an examination of an (exogenous) stem as is necessary to enable them to become so familiar with its minute characteristics, that they should be at no loss to identify any portion of it should they meet it in company with other tissues. The necessity of this apparently tedious course will be seen, if it be borne in mind that it is in the form of *powders* that drugs are most commonly adulterated, and that these are nowadays so thoroughly in a state of comminution that it is seldom more than two or three contiguous cells remain in coherence. The more thoroughly the preliminary course of training be gone through, the more easy and reliable will be the work of the analyst.

Suppose now we have an unknown exogenous stem submitted to us for microscopic examination, and desire to give a thorough report of its microscopic characters. This is just such an examination as the microscopical analyst has to make whenever he comes across, as he frequently does, a new importation in the shape of a fresh medicinal root, stem, or bark, which is likely to come into the market in the form of powder or other adulterable fashion. We ask first, is there any pith* (medulla)? If so, are the cells of which it is composed coloured? Are they apparently modified by later deposits (as in *Hoya*) on their primal wall? Do these cells contain any starch? If so, we must examine this under a high power, and take the average size of the granules. We must also examine these by polarized light, both

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* In roots this is frequently indiscernible.

with and without selenites. (I have, in my paper on "The Optical Examination of Beeswax," given some notes on the use of the polariscope in pharmacy. I need not therefore enlarge upon this part of the subject here, further than to say that, for use in analysis, it is of the first importance that the analysing prism should be capable of being rotated.) We must see if there be present other secondary cell-products, such as crystals or raphides. If these be present, we must ascertain their size, shape, percentage to cells, and, if possible, their nature. The diagnostic value of these cell-products is often of the first importance (in examination of pulv. rhei, for example). We should also examine the cells of the medulla in the direction of both their long and short axis, to see whether their walls be pitted (as in elder) or not, and, when pitted, ascertain the nature and arrangement of the "pitting." This done, we shall probably be able to know these cells if we meet them again.

We must next attack the vascular sheath of the medulla. Is this complete or not? That is, do the vessels of which it is composed encircle the pith, or are they (in chicory, for example) in separate wedges? Are the vessels wholly spiral? Are the spirals single, double, or even quadruple? Are they left- or right-handed? These questions can be easily answered if their sections be cut in two directions (transverse and vertical) with a sharp razor, and the vessels teased out by needles. The presence or absence of laticiferous vessels, or other receptacula, should be ascertained, and, when present, the nature of their contents (as in rheum, glycyrrhiza, etc.). The character of the cells forming these receptacula is of importance, as in many cases our detection of an adulteration (pulv. rhei) depends upon our familiarity with slight variation of these vessels in closely allied species of the same genus. Glycerine forms the best medium in which specimens of this nature can be examined. The woody layers of the stem or roots next demand our attention, and require its somewhat prolonged exercise. We notice first the arrangement of the medullary cells, their size and nature. We ascertain whether they be porous or not; whether they have any contents, and, if so, their nature, whether organic (starch) or inorganic (raphides or other crystals). We next examine the vessels of the woody layers. These are of the most varied character, and are usually of the greatest diagnostic value. After having noted their distribution through the wood layers, we have to make careful longitudinal sections, so as to expose their walls for some considerable distance. We shall almost invariably find that these vessels are what are known as "dotted ducts," and not spiral vessels. Many of those found in the examination of pharmaceutical specimens are exceedingly interesting. I shall describe them in detail by-and-by. The colour of these vessels is of some importance, and should be noted, as also the nature of their contents, if any.

The immediately contiguous prosenchyma next demands our notice. The character of the secondary (sclerogen) deposits, as seen in section, requires to be carefully observed. This applies equally to the woody tissue properly so called, as these cells (called by Dr. Hassall "stellate cells") are often boldly characteristic. Secondary cell-contents, when present, require to be carefully examined, and their nature and quantity determined.

The bark next comes before us. Here, in addition to the relative arrangement of its several parts, we have chiefly to concern ourselves with the presence or absence of inorganic products and of secondary cell-contents in the parenchyma, with the length or shortness of the liber-cells, together with the arrangement of their secondary deposits.

The examination of an endogenous stem, of a corm, bulb, or rhizome, would follow the same general rules, each tissue being separately and thoroughly examined, and the peculiar features of each class of cell entering into its structure accurately ascertained.

In the examination of seeds, the number of their coats should be noted, the nature of the cells composing these, with the character of their contents and secondary deposits. The structure of the seed itself, its receptacula, if any, with the shape and properties of its cell-products, require special attention. In leaves, and foliar organs generally, the character of the cuticle, number, size and arrangement of stomates and hairs, with characteristics of vessels, cell-contents and deposits, must be observed. To sum up, the work of the analyst in this department requires an intimate acquaintance with the anatomy of the plant, as does that of the physician with the anatomy of the human body.

After this long, but, it is hoped, not useless digression, I will return to the detective work in which I was engaged.

(*To be continued.*)

PEPSIN.

A NEW PRACTICAL METHOD TO PREPARE IT; ITS PROPERTIES AND DIGESTIVE STRENGTH.

BY E. SCHEFFER.

(*Continued from page* 762.)

Properties of Acidulated Pepsin.—An acidulated solution of pepsin was made, of such strength that one fluid ounce contained one grain of purified pepsin and two drops of hydrochloric acid, and experimented with.

By boiling, the clear liquid becomes turbid and upon cooling, deposits flakes.

By addition of alcohol it remains clear at first, but upon standing, flakes of pepsin separate from it.

Strong hydrochloric acid produces slight turbidity, which disappears by addition of more acid or by dilution with water.

Chloride of sodium gives the characteristic precipitate.

Bichloride of mercury produces opalescence.

Tannin forms a heavy precipitate, soluble in hydrochloric acid.

Gallic acid shows no action.

Carbonate and bicarbonate of soda produce a precipitate soluble in excess.

Modified Pepsin.—A solution of carbonate of soda carefully added to a solution of pepsin produces a precipitate which, upon being separated from the liquid, will prove to be pepsin; but a little more of carbonate of soda will redissolve it again, and the liquid no longer contains pepsin; that is, the pepsin is destroyed or modified.

This circumstance caused me to say in my essay (*American Journal of Pharmacy*, 1871, page 6), "dry pepsin, precipitated with alcohol from its solution, did not act at all on albumen," which remark I herewith revoke as erroneous. The fact was, that intending to make pure pepsin and not getting a precipitate by alcohol in the sour solution, I added carbonate of soda to neutralize the acid, and then obtained by alcohol a precipitate which I believed to be pure pepsin; at that time I had not studied the change which carbonate of soda produces in pepsin.

When I say above the pepsin is destroyed, I mean its action on fresh coagulated albumen. A pepsin solution, made entirely neutral, or rather a little alkaline by addition of carbonate of soda, which afterwards is acidulated again with hydrochloric acid, has lost its power to dissolve fresh coagulated albumen.

The alkaline solution assumes a foul odour after a short time; it does not act on fresh coagulated albumen, except when putrefaction sets in, and then the more putrid the solution becomes, the more it seems to act on albumen; at the same time the most natural odour of healthy human fæces will show itself.

But, on the other hand, the alkaline solution, by itself as well as when acidulated, dissolves partly digested albumen.

Coagulated albumen, put into pepsin solution until half gone, then taken out on a cloth and washed and put into an alkaline pepsin solution, will dissolve; it will likewise dissolve in an alkaline solution which has been again acidulated by the addition of hydrochloric acid. But these solutions have a different appearance from a solution by pepsin; they are not as clear and thin a liquid as the latter.

An alkaline (modified) pepsin solution does not get precipitated by chloride of sodium, but upon addition of hydrochloric acid, a copious gelatinous precipitate will be immediately formed.

Digestive Power of Pepsin.—In my former experiments the strength of pepsin was ascertained by allowing its solution at a certain temperature to act upon a convenient quantity of coagulated albumen for a given time, and determining the quantity dissolved by weighing that undissolved; the albumen by this method was only partially dissolved. In my recent experiments I determined the strength by ascertaining the amount of albumen that would be fully dissolved in a certain time and at a given temperature. I had found that the solvent power of pepsin is not in inverse proportion to the time; for if a pepsin dissolves x albumen in s time, $2a$ pepsin will not dissolve x albumen in $\frac{s}{2}$ time, as might be supposed, but require longer time. The last portion of coagulated albumen to be dissolved in an experiment requires much longer time in proportion, even when pepsin is in excess.

Having used heretofore, in my experiments with pepsin, 10 drops of hydrochloric acid to the fluid ounce of water, I wished to determine whether or not a smaller quantity of acid would answer the same purpose. It was of importance to ascertain if by the preparation of liquid pepsin a smaller quantity of acid would produce the same results, as some complaints were made of the acidity of that preparation as first prepared.

Of four experiments, in which a certain quantity of pepsin was dissolved in 1 ounce of water with respectively 4, 6, 8 and 10 drops of hydrochloric acid of 1·17 sp. gr., the same amount of coagulated albumen was dissolved in the shortest time where 6 drops, next where 8 drops, and thirdly, where 10 drops of acid were employed; while the experiment containing 4 drops of acid had, after six hours, a considerable quantity of albumen not dissolved. I therefore made all my subsequent experiments with a solution containing 6 drops of hydrochloric acid to the fluid ounce of water, at a temperature of 100° to 105° F., and each vial was shaken about every ten minutes.

One grain of purified pepsin in 4 oz. of acidulated water was found to dissolve 400 grs. of coagulated albumen in eighteen hours at 75° F.

One grain of purified pepsin in 4 oz. of acidulated water dissolves 500 grs. coagulated albumen at a temperature of 105° F., in six hours.

Ten (10) grains of saccharated pepsin dissolve 120 grs. of coagulated albumen in four to six hours, at 100° F.

Although I did not succeed in preparing a pepsin like Wasman's, of which one part was capable of dissolving 60,000 parts of coagulated albumen, I found that the digestive power of pepsin was almost inexhaustible.

With one-half grain of purified pepsin in 2 oz. of acidulated water I dissolved 250 grains of coagulated albumen; to the solution was added another ounce of acidulated water and 250 grs. of albumen; when it was again dissolved I added acidulated water and albumen in the same proportions, until finally the one-half grain had dissolved 1500 grs. of coagulated albumen. That it would have dissolved still more I proved in an experiment, mentioned hereafter.

Pepton Solution.—When the albumen, which by the digestive process is converted into albuminose or pepton, is perfectly dissolved, the resulting pepton solution is a very limpid, thin, slightly yellowish-coloured liquid, which, when filtered, has an opalescent appearance.

By addition of alcohol it remains at first clear, but forms, after twenty-four hours, a gelatinous precipitate.

Pepton Precipitate.—An equal volume of saturated salt solution added to the pepton solution produces a copious, perfectly white precipitate, which, upon being collected on a filter, drained, pressed and dried, yields a hard white substance containing pepsin, pepton, chloride of sodium and a little acid. Put into water it becomes translucent, like horn, and dissolves after some time.

Its solution has an acid reaction, and is not coagulated by heat; hydrochloric acid produces a heavy precipitate which, by dilution with water or by addition of more acid, will redissolve; with alcohol it becomes opalescent and forms after some time a precipitate.

Bichloride of mercury gives a heavy white precipitate.

Coagulated albumen put into the watery solution is hardly acted upon, but when acidulated with hydrochloric acid it is dissolved.

Digestive power of the Pepton Precipitate.—The digestive power of the precipitate, obtained by addition of sodium chloride to the pepton solution is remarkable. In many cases a solution of 1 gr. of the precipitate in 1 oz. of acidulated water dissolved 100 grs. of coagulated albumen.

With 20 grs. of saccharated pepsin in 2 oz. of acidulated water I dissolved 240 grs. of coagulated albumen; the precipitate obtained from this solution by chloride of sodium weighed, when dry, 12 grs., of which 1 gr. dissolved 100 grs. of coagulated albumen; from this last solution again, by chloride of sodium, 10 grs. of precipitate were obtained, of which 1 gr. dissolved between 20 and 30 grs. of coagulated albumen. In this way the 20 grs. of saccharated pepsin, for which I only claim the power to dissolve 240 grs. of albumen in six hours, dissolved at the rate of between 4000 and 5000 grs.

The solution of 1500 grs. of albumen, obtained by fractional addition of albumen and acidulated water to an acidulated solution of half a grain of purified pepsin, mentioned above, furnished with chloride of sodium a precipitate, which also had considerable digestive power.

(*To be continued.*)

COORONGITE, OR MINERAL CAOUTCHOUC OF SOUTH AUSTRALIA.

BY JOHN R. JACKSON, A.L.S.,
Curator of the Museums, Kew.

(*Concluded from page 764.*)

This, then, is an exposition of one side of the question, written before the Rev. M. J. Berkeley had seen the substance. The following very careful and sensible remarks on the other side are abstracted from a letter signed, H. T. Whittell, in the *Adelaide Observer* of Sept. 30th last:—"Mr. Berkeley is well known as one of our highest authorities on the lowest forms of vegetable life; and under ordinary circumstances, I should unhesitatingly accept his opinion as conclusive; but in the present instance, I wish to submit two or three difficulties in the way of the reception of his conclusion, but which he or some competent botanist may be able to remove. I leave out of consideration the opposing evidence brought by chemical analysts, and confine myself to such as is afforded by microscopic examination. My first difficulty arises from the fact that, although there are to be seen scattered through the substance indications of the remains of organic tissues, I have never been able to have a continuous structure of cells or fibre, such as can be readily made out in other vegetable growths. The second difficulty is found in the appearance and position of the so-called 'gonidia.' I am reluctant to suggest that Mr. Berkeley has taken the sporules of a fungoid growth for the gonidia of a lichen; but I am not without a suspicion that a closer examination may lead him to alter his report. If one of the thinner layers of the 'caoutchouc' be held up to a strong light, there will be seen in its substance a number of black-looking streaks. If a section be made so as to intersect one of those streaks, it will be found generally (though not in every case) that the black streak is in reality a hollow space lined with dark brown sporules (?) with a lighter coloured mycelium interspersed. The greater number of these sporules measure one-3500th of an inch in diamater ($\frac{1}{3500}$ inch), but some are as large as the 2500th of an inch ($\frac{1}{2500}$ inch). The mycelium appears to be formed by the union of small cells end to end. If the section has been a fortunate one, the preparation is a pretty object for the binocular microscope with a two-thirds object-glass; but it requires a fifth or an eighth to bring out the details as above described. In some sections the substance around the spaces is traversed, as if by extension, for a short distance by branching tubules, resembling what I have described as mycelium. My impression is that Mr. Berkeley's further examination will lead him to believe that the structures I have described are not gonidia; but I shall be willing to accept his decision if, after such examination, he sees no reason for altering his present opinion. My last difficulty is, perhaps, the chief one. In the course of my examination of these sections under medium powers (say a fifth), I became aware of the presence of several varieties of diatoms imbedded in the substance of the section. These were not carried from the surface by the knife in making the section, but were buried, so to speak, in the substance itself, and no amount of washing would remove them. The principal forms are *Naviculæ* and *Cocconemæ*. The endochrome has disappeared, leaving nothing but the silicious valves, on which, in a lucky section, the striæ, and even dots can be distinctly seen. Since I have discovered their presence, I have seldom made a thin section without finding them. If the substance itself is a lichen, how have these diatoms become incorporated in its structure? This is a puzzle I am not competent to solve. I content myself with stating what the microscope reveals, but I must leave the interpretation to others. Meanwhile, it would appear that, if further investigation at the place where the 'caoutchouc' is found should show that the substance is originally exuded in a fluid state from the earth or from some vegetable growth, and that during its solidification it imbeds the diatoms and other organic structures which happen to lie in its locality, the result so arrived at would accord with all that we know at present of the nature and composition of the substance in question."

We have gone to the length of extracting the bulk of these two letters from a mass of correspondence on the subject, firstly, because they are fair expositions of both sides of the question, and secondly, with the hope that the remarks contained in them may help those who have the opportunity of examining the substance at home to come to some unanimous conclusion as to its true nature, which we doubt not will prove to be a hydrocarbon.

It is but fair to Mr. Berkeley to state that the specimen sent to him was very small.

LICORICE.*

BY R. ROTHER.

The ordinary commercial licorice, whether in sticks or powder, is always a very impure substance. The average real soluble extract contained in it exceeds not 50 per cent., and is usually so deteriorated in the process of extraction that it is but a very feeble representative of the crude root. The glucoside glycyrrhizin is the representative element of the root. Like the glucosides in general it possesses acid properties and combines with bases. In licorice root the greater part is combined with ammonia, forming a very soluble salt, decomposable by acids with separation of glycyrrhizin, which is sparingly soluble in water, but readily soluble in al-

* As this article is a reprint from an American source, the author's orthography for this word has been retained, although "liquorice" is the more common form in this country, but perhaps not quite so correct.—ED. PHARM. JOURN.

cohol. This, when subjected to the action of diluted acids, at elevated temperatures, is, similarly to all glucosides, under the same influence, split up into another compound and glucose.

The licorice of commerce is mostly derived from Spain and Italy. There it is obtained by the crude process of boiling the albuminous and starchy root with water, and boiling down the infusion in copper vessels to the required consistence. Other inert substances are frequently incorporated with a view to adulterate or give it firmness. If the infusion, during the process, becomes sour, the glycyrrhizin separates, and eventually suffers decomposition by the action of the acid.

Licorice is much used in medicine; and although medicinally of little importance, yet, however, it is the desire of the pharmaceutist to furnish this, as well as all other pharmaceutical products, of the best attainable quality. Commercial licorice always has an acrid, unpleasant taste, entirely distinct from the peculiar and pleasant flavour of the root. Pharmaceutically, therefore, the crude licorice should never be used. In Europe it is purified for medicinal purposes, by exhausting the crude article with cold water and evaporating the solution to the proper consistence, which may be in three forms, namely: in powder, pilular extract and syrupy liquid. The purified preparations obtained from crude licorice, however, possess its dark colour and bad flavour, the insoluble matters only being removed; otherwise, it is no better than at first; even during this operation more of the glycyrrhizin may have been decomposed.

It was found that licorice root, when exhausted with cold water and the infusion carefully evaporated to dryness, yielded 20 to 25 per cent. of light brown extract, having the original flavour of the root, equal to 30 or 35 per cent. of pilular extract, or 50 per cent. of syrupy liquid.

The liquid preparations of licorice or licorice root are mostly aqueous or syrupy, and in a dilute condition will not keep without the addition of preservatives. These must either be alcohol, glycerin, or saline substances. The writer, however, discards the first two for this purpose in the three preparations of licorice root about to be noticed. These are liquid extract of licorice root, syrup of licorice root and compound syrup of licorice root. Owing to the invariably inferior quality of crude extract of licorice root, it is the opinion of the writer that pharmaceutists should make all the preparations of the so-called licorice directly from the root. This is further supported by the facility with which they can be obtained from this source. In these processes the writer aids the extraction of all the glycyrrhizin by the addition of more ammonia. The liquid extract of licorice root, when made of the concentration above stated, is very permanent, and will keep almost any length of time in all seasons of the year. It is a purely aqueous solution of pure extract of licorice root, intended for dispensing purposes, and the extemporaneous preparation of simple syrup of licorice root. This latter will not keep long, and must always be made fresh as demanded. Compound syrup of licorice root is a permanent syrup, of the same strength as the simple syrup, and contains ammonium chloride, which preserves it. This combination is a very popular cough remedy, long and favourably known as Hufland's German Cough Mixture.

Liquid extract of licorice root is prepared by exhausting the root in coarse powder by means of percolation with a menstruum, consisting of alcohol $\frac{1}{4}$ or $\frac{1}{6}$, and water $\frac{3}{4}$ or $\frac{5}{6}$, with about 2 fluid drachms of 16 or 18 per cent. ammonia water in each pint of the mixture. The percolate is heated to boiling to precipitate the dissolved albumen and filtered hot; the residue on the filter is washed with hot water and the filtrate evaporated to half the weight of the root employed. The process may further be stated as follows:—

Take of Licorice Root in No. 20 or 24 powder, 32 troy ounces.
Alcohol one pint.
Water sufficient.
Water of ammonia (16 or 18 per cent.) $1\frac{1}{2}$ fluid ounces.

Mix the alcohol with 5 pints of water and add the ammonia. Moisten the powder with 6 fluid ounces of the mixture, pack firmly in a cylindrical percolator forming a column of medium height, and pour on the remainder of the mixture, and then water until 6 pints of percolate has passed; heat this to the boiling-point and filter; when the liquid has disappeared from the surface mix the residue with a pint of water, heat and filter; mix the filtrates and evaporate the liquid carefully until it weighs 16 troy ounces.

Syrup of licorice root is prepared as follows:—

Take of Liquid Extract of Licorice Root one drachm.
Syrup sufficient to make one fluid ounce.
Mix.

To make compound syrup of licorice root the writer's first process consisted in exhausting the root with water by percolation, boiling the percolate, filtering, evaporating the excess of liquid, dissolving the ammonium chloride and sugar in the residuary liquid with heat, and straining whilst hot.

This method, however, was found too circumstantial. The root was then treated by repercolation with water, and also with water containing some of the ammonium chloride. To the strong percolate the ammonium chloride was then added, the quantity used forms a nearly saturated solution of the salt. This at once produces a dense resinous precipitate, which rapidly subsides as a heavy tenacious mass, insoluble in water but rapidly soluble in ammonia or disodic carbonate, and then again readily miscible with the saline solution from which it had separated. It is, therefore, evident that ammonium chloride separates the native combination of glycyrrhizin from its solution prepared with cold water, and also that a sufficiency of ammonia previously added prevents the precipitation, probably by forming a more basic salt of glycyrrhizin, which is soluble in a saturated solution of ammonium chloride.

From these observations the writer derived the following excellent and expeditious process long and successfully employed:—

Take of Licorice Root in No. 24 powder, 32 troy ounces.
Ammonium chloride in No. 24 powder; sufficient.
Sugar $6\frac{1}{2}$ lbs. avoirdupois.
Ammonia water (16 or 18 per cent.), 3 fluid drachms.
Water sufficient.

In 6 pints of water dissolve 6 troy ounces of ammonium chloride and add the water of ammonia, moisten the root with 6 fluid ounces of this mixture, pack it firmly in a cylindrical percolator and pour on the remainder of the mixture, and then water until 4 pints of percolate has passed; in this dissolve 12 troy ounces of ammonium chloride, pour part of this solution upon the sugar, and when it has crumbled add the remainder; stir frequently with a pestle until the sugar has dissolved and strain through muslin. No heat is employed in this process, and the ammonia is completely saturated. The preparation is dark brown and permanently clear and transparent; it contains some albumen, and one fluid ounce contains one drachm of ammonium chloride and approximately represents 2 drachms of licorice root. —*Chicago Pharmacist.*

THE CONVERSION OF GLUCOSE INTO MONATOMIC AND HEXATOMIC ALCOHOLS.*

BY M. G. BOUCHARDAT.

In further investigating the decomposition that takes place in the formation of dulcite in a solution of inverted sugar of milk by the action of sodium amalgam,† the author has found the reaction to be a very complex one. Independently of the hexatomic alcohol (dulcite), there are formed under the influence of the nascent hydrogen a certain quantity of monatomic alcohols, among which have been recognized ordinary alcohol (C_2H_6O), isopropylic alcohol (C_3H_8O), and finally a hexylic alcohol ($C_6H_{14}O$), identical with that from which Erlenmeyer and Wanklyn have prepared hydriodic ether by distilling mannite or dulcite with hydriodic acid. M. Bouchardat's experiments have been extended to glucose, sugar of milk, and inverted sugar of milk.

Glucose.—A solution made by boiling 500 grams of glucose in five or six litres of water was brought in contact with amalgam, containing 3 per cent. of sodium, in a wide-mouthed flask fitted with a tube passing into water to collect the volatile products. The reaction commenced at once, with a slight elevation of temperature. When the liquid commenced to change from a brown to an amber colour, it was neutralized exactly with dilute sulphuric acid. Heat was then applied until about one-fifth of the original volume had passed over, and this product was twice redistilled, rejecting each time about a tenth of the liquid placed in the retort. An oily layer was then found floating on the top, which was separated from the water, and treated with an excess of crystallized carbonate of potash.

The volatile product so obtained was first distilled over baryta, and then submitted to fractional distillation, when it was found to consist of a mixture of ordinary ethylic alcohol, isopropylic alcohol, and a hydrate of a hexylic alcohol, corresponding to the idriodic ether obtained by Erlenmeyer and Wanklyn by the action of hydriodic acid upon mannite. This, the least volatile, passed over at 138° C. to 145° C., and the residue then left in the retort yielded, after separation of the sulphate of soda, a large proportion of mannite.

Sugar of milk (lactine), treated in a similar manner, yielded volatile products identical with the foregoing. The residue, separated from the sulphate of soda, deposited crystals having the same composition and form as natural dulcite ($C_6H_{14}O_6$).

The residue from inverted sugar of milk, treated with ammoniacal subacetate of lead, and the precipitate washed and decomposed in water by sulphuretted hydrogen, filtered and evaporated, deposited crystals consisting of dulcite and another body having all the characteristics of pure mannite.

It appears from these results that milk-sugar is a compound analogous to cane-sugar, which can be decomposed into two kinds of glucose, one giving by hydrogenation dulcite, and by oxidation mucic acid; the other yielding by hydrogenation mannite. The alcoholic compounds furnished in each case are the same, viz. ordinary alcohol, isopropylic alcohol and hexylic alcohol.

THE POTASH, SODA AND MAGNESIA COMPOUNDS IN THE ROCK SALT DEPOSITS OF STASSFURT.‡

The most interesting and important mineral deposits of recent discovery are those of the salt works at Stassfurt, in Prussia. They have produced quite a revolution in domestic economy, giving to the chloride of potassium, which is found at a depth of a thousand feet, a great commercial value. This, with other peculiar salts, was discovered accidentally by the chemist H. Rose in the waste of the salt mine. The matter was at first lightly esteemed, the chloride of potassium being even regarded as a nuisance; but it is now thrice as valuable as the rock salt, which was formerly the only product sought. Over 30,000 tons have been extracted and sold in Germany, France and England; 3000 tons were brought last year to the United States to be used in manufacturing saltpetre, by converting the chloride of potassium into the nitrate.

Pearl-ashes and pot-ashes were formerly exported from the United States to all foreign countries; but our forests are getting cleared, and these products are no longer largely prepared. Sweden likewise has failed to supply France and England with vegetable ashes; and the development at this juncture of the great potash mineral deposits of Stassfurt is a striking providence.

The salt deposits of that locality underlie the new red sandstone of the triassic period (called the *Bunter sandstein*), and comprise four distinct levels, having a thickness of nearly 1000 feet. Beginning at the lowest level we find:—

1. *Anhydrite* (sample shown). The bed comprises rock-salt and sulphate of lime, which is anhydrous; 350 feet in thickness.

2. *Polyhalite*, 100 feet in depth, elsewhere frequently of brick red colour, but in this locality white. It is composed of sulphate of potash, lime and magnesia; has a weak, bitter taste and fibrous appearance, and is here likewise imbedded in rock-salt.

3. *Kieserite*, a sulphate of magnesia, associated with salt. The bed is 75 feet in thickness, and has carnallite also in the gangue.

4. *Carnallite*, the potash salt of greatest value. It is properly a double chloride of magnesium and potassium, associated with the rock-salt in the following proportions:—

50	per cent. of the		potash salt.
25	„	„	magnesia salt.
25	„	„	rock salt.

5. *Tachhydrite*, an amorphous salt, composed of chloride of calcium and magnesium.

6. *Sylvite*, a pure chloride of potassium.

7. *Kainite* contains the hydrated chloride of potassium and sulphate of magnesia.

8. *Boracite*, a borate of magnesia, but in this locality containing more of borate of lime. It is amorphous, and unlike the boracite crystals found in the gypsum of Luneburg, in Germany. It resembles more the *Hayesine* of Peru. This mineral has also been called *Stassfurtite*. It is found below the carnallite and only at one locality.

The extent of the great mass of carnallite, which is of a flesh-red colour, has been proved by exploration to be equal to 6,000,000 tons of chloride of potassium.

It is quite remarkable that the salts found below the proper salt stratum are mostly hydrated, while the salt and anhydrite are anhydrous. The salt-beds in a large body cover the surface, and on passing downward we meet with the different strata in the following order:—kainite, carnallite, sylvite, kieserite, polyhalite, anhydrite with rock-salt.

These deposits have been found also in shafts sunk at Anhalt, half a mile distant from Stassfurt.

Caustic potash and carbonate of potash are produced extensively from the chloride.

There are five products prepared for the trade from these saline materials: 1, chloride of potassium; 2, sulphate of potash; 3, carbonate of potash; 4, sulphate of soda; 5, potash compounds to be used as manures. To these must be added bromine and bromides.

The carnallite, which is the main substance yielding the chloride of potassium, is treated in the following manner:—The crude mass contains 16 per cent. of the latter salt. By treating it with a limited quantity of water, a hot solution is formed, containing the chloride

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* See *ante*, p. 566. † Compt. Rend. vol. lxxii. p. 1008.

‡ Read before the Polytechnic Association, January 12th, 1872, by Dr. Lewis Feuchtwanger, and accompanied with the exhibition of the saline products of the different strata.

of potassium, and leaving the common salt undissolved. This on cooling will deposit the crystals of the chloride of 80–90 per cent., like the specimen, brought into the United States market. The mother water is now concentrated and treated with ether, which dissolves the bromine. By adding caustic potash to this ethereal solution, the colour at once disappears; on evaporation, the bromide thus obtained is decomposed by sulphuric acid and peroxide of manganese, and the pure bromine is distilled over, of specific gravity 2966. The bromine and bromides of potassium and sodium have likewise proved a great source of revenue; and yet, since the manufacture at Stassfurt began, the price of these articles has been reduced to a quarter of its former amount.

The origin of the Stassfurt deposits is yet a great mystery. The grounds for believing that sea-water was the prime cause, and that this locality was in former ages an estuary of the sea are not very valid; nor does it seem likely that salt water has been produced from saline efflorescences, through which the concentrated waters were gradually evaporated, and that the waters at a later period were interrupted by a change in the configuration of the surface of the country.

The presence of boracite leads us to suppose that the various bodies of salts were deposited after their subjection to an internal heat, which caused the diminished hydration mentioned above, the boracic acid being introduced by the eruptive phenomena, whereby hydrochloric acid may also have been generated, to which the chlorides may owe their existence. It is well known that rock-salt is one of the products of volcanic emanations and of springs in volcanic regions, and it has been shown also that salt may be traced to a certain depth, associated with lavas.

All brine springs rise up through strata of sandstone and red marl. We find in England large beds of rock-salt and brine springs, which have been flowing for 1000 years.

In the triassic period we find salt, gypsum and magnesian limestone more or less associated, while the gypsum and salt lie in many localities in the blue clay, without the red sandstone. After consideration of the subject, I cannot think but that the origin of rock-salt is derived from the evaporation of lakes and lagoons communicating with the ocean.

A salt lake on the Abyssinian frontier, exposed to the unmitigated rays of the sun, is known to have been shrunk into an elliptical basin, seven miles in its transverse axis, which is half filled with water, and the other half with a sheet of snow-white solid salt.

The Dead Sea is known to contain pure salt in its water.

In the United States the rock-salt deposits of Louisiana are of immense depth. In Nevada are salt deposits 14 feet in thickness and 5 miles square. The salt springs of Illinois pass through five strata of coal and then through the new red sandstone, and discharge daily thousands of gallons.—*The New York Druggists' Circular.*

CREASOTE AND CARBOLIC ACID.

In the year 1832 a body was discovered by Reichenbach in the distilled oils of beech-wood tar, which, on account of the peculiar property it possessed of preserving meat and other highly organized compounds, was called by him creasote. This substance attracted the attention of many chemists, who studied its properties and sought to separate it from tar-oils in general, and it was with a degree of satisfaction that, two years later, F. F. Runge announced his discovery of a creasote in coal-tar oil, which he called carbolic acid. Reichenbach, fearing his discovery would be put into the shade by this carbolic acid, which, according to Runge, differed slightly from creasote, tried to demonstrate the identity of the two substances; and though Laurent, in the year 1841, proved carbolic acid to be phenylic hydrate, and pronounced it a different body from creasote, Reichenbach did not give up the contest, but conducted it with a pertinacity which caused a general confusion among chemists, a confusion which became quite lamentable, when, in 1855, cresylic hydrate was discovered in coal-tar by Fairlie, and which, on account of the near resemblance to true creasote, was generally accepted to be identical with the compound obtained from beech-wood.

Many chemists have given their attention since then to the study of these two compounds. As, however, carbolic acid, very shortly after its discovery, began to be introduced in commerce and sold under the name of creasote, it was difficult and at times impossible to procure the oils obtained from wood-tar. Owing to this fact, we read, in the publications of some chemists, of results as derived from the analysis of creasote, that apply to carbolic acid, with which they were in fact working, and which they had obtained as creasote. Hlasiwetz and Gorup-Besanez, among many others, have now cleared up the contested questions, and brought light and intelligence into the many contradictory statements which we find in the literature of creasote and carbolic acid. We know to-day that two homologues are contained in that part of the oil of wood-tar which dissolves in caustic potash, and which bear a certain relationship to the two homologue compounds contained in the same part of the oil derived from coal-tar. We are justified in stating that these oils are two distinct and different fluids, for while coal-tar oil contains principally

Phenylic hydrate, C_6H_6O, and
Cresylic hydrate, C_8H_8O,

wood-tar oil contains

Guaiacol, $C_7H_8O_2$, and
Creasol, $C_8H_{10}O_2$ (also called homo-guaiacol).

The near relationship of phenylic hydrate or carbolic acid to guaiacol, and of cresylic hydrate or cresylic acid to creasol, becomes apparent by comparing the formulas, and we no longer wonder that cresylic acid at the time of its discovery was thought to be identical with creasote.

It may be well here to say a few words about the place we have to assign to these compounds in organic chemistry, and about their constitution, before giving the differences by which one class can be distinguished from the other. Phenylic hydrate belongs to a series of compounds, the radicals of which differ by the complex CH_2. They are probably very numerous, and of those already known, may be mentioned

Phenyl, C_6H_5
Benzyl, C_7H_7
Xylol, C_8H_9 (also called phloryl).

In combination with hydrogen these radicals form
Phenylic hydride, C_6H_6, or Benzol.
Cresylic hydride, C_7H_8, or Toluol.
Phlorylic hydride, C_8H_{10} or Phlorol (also called xylol).

Their alcohols are

Phenylic hydrate, C_6H_6O, or Phenol (carbolic acid).
Cresylic hydrate, C_7H_8O, or Cresol (cresylic acid).
Phlorylic hydrate, $C_8H_{10}O$, or Phlorol (Wurtz' xenol).

In treating these alcohols with oxidizing substances, we obtain, at least in the case of phlorol, substances which contain more oxygen and less hydrogen than the alcohols, and which we call

Chinon, $C_6H_4O_2$
Kreson, $C_7H_6O_2$
Phloron, $C_8H_8O_2$.

We said in the case of phlorol: for though we are able to produce the other two compounds, the first by heating chinic acid, which in combination with lime is a constituent of all Peruvian barks, and the second by decomposing cresol, we shall, no doubt, in time arrive at a proper method for obtaining them all directly, by treating the alcohols with nascent hydrogen.

In subjecting gum guaiac to destructive distillation, we obtain a fluid which in many respects bears a great resemblance to creasote. This distillate has been especially investigated by Vœlckel and Sobrero and Hlasiwetz, who succeeded in separating it into two fluids, that gave crystallizable compounds with bases, and which they called guaiacol and homo-guaiacol. A later and closer study of creasote revealed the fact, that it consisted of these two identical compounds in different proportions. Let us compare them with the products we obtained from the alcohols of the phenylic series:—

Chinon, $C_6H_4O_2$, Pyrocatechin, $C_6H_6O_2$
Kreson, $C_7H_6O_2$, Guaiacol, $C_7H_8O_2$
Phloron, $C_8H_8O_2$, Homo-guaiacol, $C_8H_{10}O_2$.

In treating chinon with nascent hydrogen, we obtain hydrochinon, and succeed also in producing similar compounds from creoson and phloron, thereby establishing the existence of two homologue series of compounds having the same composition, but differing in properties.

Pyrocatechin, $C_6H_6O_2$, and Hydrochinon
Guaiacol, $C_7H_8O_2$, and Hydrocreoson
Homo-guaiacol, $C_8H_{10}O_2$, and Hydrophloron.

Now let us look at the constitution of these compounds. It is very probable, and almost admitted by Kekulé, that cresol is monomethylated pyrocatechin, and homoguaiacol or creasol bimethylated pyrocatechin. In fact, in treating guaiacol with hydriodic acid we obtain iodide of methyl and pyrocatechin, which amounts to a proof of this view, and which gives us two links by which we may connect the members of the coal-tar series with those of the wood-tar series. To render the constitution more apparent to the eye, the formulas may be given thus:

C_6H_5 (OH) Phenol (carbolic acid, coal-tar).

$$C_6H_4 \left\{ \begin{matrix} OH \\ CH_3 \end{matrix} \right\} \begin{matrix} \text{Cresylic acid, coal-tar.} \\ \text{Cresol.} \end{matrix}$$

$$C_6H_3 \left\{ \begin{matrix} OH \\ CH_3 \\ CH_3 \end{matrix} \right\} \text{Phlorol.}$$

C_6H_5O (OH) Pyrocatechin.

$$C_6H_4O \left\{ \begin{matrix} OH \\ CH_3 \end{matrix} \right\} \text{Guaiacol.}$$

$$C_6H_3O \left\{ \begin{matrix} OH \\ CH_3 \\ CH_3 \end{matrix} \right\} \begin{matrix} \text{Creasote, wood-tar.} \\ \text{Homo-guaiacol.} \end{matrix}$$

It may be stated in further proof for the correctness of considering the above-mentioned compounds as methylated pyrocatechin, that the molecule of methylene, CH_3, may be introduced directly into the constitution of pyrocatechin, by heating it in closed tubes with caustic potash and sulpho-methylate of potash, producing thereby guaiacol.

The homologues of the phenylic series are crystallizable compounds of the respective boiling points of 184° C., 203° C., 220° C., while the two derivatives of pyrocatechin are oily liquids boiling at a temperature of 200° C. and 219° C.

Phenol,	184° C.	Pyrocatechin.	
Cresol,	203° C.	Guaiacol,	200° C.
Phlorol,	220° C.	Creasol,	219° C.

It can be seen, therefore, that in cases of working with mixtures of the individuals of both series, we should find it impossible to separate them by fractional distillations. Their products of decomposition, however, may be resorted to as a means of distinguishing between them; for while phenol and its series yield with nitric acid nitro-phenol and similar compounds, we obtain with guaiacol oxalic acid; chlorine converts phenol into chlorophenic acid and chloronil; while the products obtained in this way from creasote, though similar to them, present differences, which stamp them as peculiar and distinct bodies.—*New York Druggists' Circular.*

ABIETENE, A NEW HYDROCARBON.*

BY WILLIAM WENZELL.

This hydrocarbon is the product of distillation of the terebinthinate exudation of a coniferous tree indigenous to California, and is obtained from the *Pinus sabiniana*, Dougl., a tree inhabiting the dry sides of the foot hills of the Sierra Nevada mountains and the coast range, known more familiarly, however, by the name of Nut Pine or Digger Pine, names seemingly suggested by the edible quality of its fruit, upon which the Digger Indians chiefly rely as an article of food.

During winter the tree is notched and guttered at a convenient height from the ground, to receive the resin which then exudes, and, when a sufficient quantity is thus obtained, it is carried to the stills for distillation. As this hydrocarbon is extremely volatile, and, therefore, much loss often sustained if the resinous exudation is kept long, distillation is usually commenced as soon as a sufficient quantity of the "gum" has been collected. The crude oil, as usually found in San Francisco, is a colourless, limpid fluid, and requires only to be distilled to obtain it quite pure. It occurs as an article of commerce, and has acquired, during the last eight or ten years, a considerable reputation under the names of abietene, erasine, aurantine, theoline, etc., for the removal of grease and paint from clothing, fabrics, etc.,—an efficient substitute for petroleum benzine.

In order to determine whether it was homogeneous in its composition, or composed of several hydrocarbons, seventeen fluid ounces of the crude abietene were distilled fractionally, and the several distillates of three ounces each separately collected. The first three ounces were obtained with the thermometer indicating 101° C., the second fraction indicated a thermometric rise of a quarter of a degree, and the thermometer rose with every succeeding fractional part until the fifth fraction indicated a boiling-point of 104° C. With the sixth or last fraction the thermometer rose rapidly from 105° to 115° C., when at this point the distillation was discontinued. The remaining ounce presented a brownish-red appearance, and left, on evaporation in a porcelain capsule, a small quantity of a solid resinous body. Each fractional part was found, on examination, to possess a boiling-point of 101° C., showing that the hydrocarbon abietene is a homogeneous liquid. Pure abietene is a colourless, limpid liquid, possessing a strong penetrating odour, bearing some resemblance to oil of oranges. It is specifically lighter than water, turpentine, absolute alcohol, and ether, its specific gravity being 0·694 at a temperature of 16·5° C. It is very volatile and highly inflammable, burning with a brilliant white, smokeless flame. It is nearly insoluble in water; soluble in five parts by volume of 95 per cent. alcohol. When poured upon the hands it evaporates rapidly, communicating the sensation of cold. Dry hydrochloric acid, passed through it for ten hours, did not react upon it. It dissolves iodine with the production of a rich purple colour; bromine is also freely dissolved, forming an orange-coloured solution. Nitric acid of sp. gr. 1·43 added to abietene occasioned no reaction in the cold, but when the mixture was heated to boiling, a moderate reaction was established with the disengagement of nitrous acid fumes. Concentrated sulphuric acid exerted no reaction whatever, either in the cold or on heating; metallic potassium was not acted upon. On passing dry chlorine into abietene, this gas was abundantly absorbed, with the evolution of hydrochloric acid gas, an increase of volume and density, accompanied by a rise of temperature. On saturating abietene with chlorine, assisting towards the end with a gentle heat, a thick liquid resulted, which, when heated on a water-bath to remove some hydrochloric acid held in solution, was found to possess the consistency of glycerine, sp. gr. 1·666, to be colourless, insoluble in water, but soluble in warm alcohol, and possessing a taste resembling balsam of fir.

* Read before the California Pharm. Soc., Dec. 13, 1871.

In comparing abietene with terebene (spirits of turpentine), the hydrocarbon obtained from other species of the pine family, the *Pinus palustris*, *P. sylvestris*, etc., some very striking differences are observed in their physical and chemical properties. Particularly noticeable is the remarkably low sp. gr. of abietene, which is only 0·694 at 16·5° C.; that of terebene being 0·840, at about the same temperature; again, the boiling-point of abietene is 101° C., while oil of turpentine boils at 160° C. Terebene absorbs hydrochloric acid with avidity, forming hydrochlorate, while abietene resists the prolonged action of this gas at ordinary temperatures. Nitric acid acts violently upon terebene, while, on the other hand, with abietene no action was instituted, and it was only by the application of heat that a quiet evolution of nitrous gas was observed. The action of chlorine upon abietene seems to furnish a true substitution product, the hydrogen of the hydrocarbon being largely replaced by chlorine, sufficient to raise the sp. gr. of the liquid from 0·694 to 1·666. When this substitution compound was subjected to distillation, at a temperature of 256°–260° C., hydrochloric acid was given off abundantly, with subsequent blackening and the disengagement of pyrogenous products, leaving, finally, a carbonaceous residue.

Abietene is a powerful solvent for the fixed and volatile oils, with the exception of castor oil, which is absolutely insoluble in abietene; while, on the other hand, castor oil is capable of dissolving nearly two-thirds of its volume of the hydrocarbon.

Abietene dissolves balsam of copaiba freely and in all proportions. Canada balsam is dissolved in all proportions up to two parts of abietene, an excess of the latter precipitating the resinous principle of the balsam entirely as a white flocculent precipitate, the volatile oil being retained in solution. Balsam of Peru requires about one-fifth of its volume of abietene to form a clear solution, but if a quantity greater than this is added a turbid mixture will result, which, on repose, will allow the excess of abietene to rise to the surface. It will be seen at a glance, from these data, that although abietene possesses the properties of a general solvent for fixed and volatile oils in every proportion, it yet is incapable of dissolving castor oil, balsam of Peru, and Canada balsam, which in their turn exert a solvent action upon abietene.

When abietene is burned in an alcohol lamp, with flame not too large, a brilliant white light is obtained, without smoking. Its vapour is powerfully anæsthetic when inhaled, and it has been used with success as an insecticide against moths, etc., when sprinkled in closed receptacles. If castor oil be mixed purposely with other fixed oils, and the mixture then shaken with four times its volume of abietene, the castor oil will be found to separate and collect at the bottom of the mixture, forming a distinct layer, consisting of one volume of castor oil and two-thirds of a volume of abietene, so that by this means sophistications of castor oil with other fixed oils may be easily detected and quantitatively determined.—*American Journal of Pharmacy.*

DUNDEE CHEMISTS' ASSOCIATION.

On Wednesday evening, March 20th, the Annual Supper of the Dundee Chemists' Association was held in the Albion Hotel. There was a large attendance. Mr. Laird, Ph.C., President of the Association, occupied the chair; while Mr. Charles Kerr, Ph.C., discharged the duties of croupier. After the usual loyal toasts, Mr. Laird proposed "Success to the Dundee Chemists' Association." He reminded those present that this was the fourth year of the Association, and said that the measure of success which had attended the Association during the past years had been most encouraging. The Society had been enabled, in some degree, to shorten the hours; but he hoped to see them still shorter, so that the assistants and the apprentices might have a better opportunity of attending the classes for chemistry and materia medica which had been established for their benefit, and by so doing improve their special professional education.

In reply, Mr. James Russell (Honorary Secretary), gave a *résumé* of the proceedings of the Association for the past year, and proposed "The Pharmaceutical Society and Conference," coupled with the name of Mr. Charles Kerr, Ph.C." Mr. Kerr, in acknowledging the toast, spoke of the value of the Association, and the impulse which it gave to the study of the higher branches of chemistry and pharmacy. In the course of the evening Mr. Laird was presented by Mr. F. Young, in the name of the Association, with a marble timepiece, in recognition of his exertions as President, and of his connection with the chemical classes. Mr. Laird suitably acknowledged the presentation. The timepiece bore the inscription—"Dignus Honore. To Mr. Wm. Laird, Ph.C., by the Dundee Chemists' Association, 13th March, 1872."

COPY OF A LETTER ADDRESSED TO CHAIRMEN OF SEVERAL CHEMISTS' ASSOCIATIONS IN THE MIDLAND AND NORTHERN COUNTIES.

74, *Market Place, Sheffield, Feb. 15th*, 1872.

Dear Sir,—The decision of the Council of the Pharmaceutical Society not to give monetary assistance to provincial associations in furtherance of their efforts to supply the required scientific education to apprentices and assistants is the cause of great disappointment and dissatisfaction in this town. Our experience at Sheffield is that, as all assistants of full age at the passing of the Pharmacy Act were admitted by Modified examination (which does not necessitate their taking further instruction in Latin, botany or chemistry), our classes are in consequence diminished, and for a time will be less numerously attended than when all have to pass through the same curriculum. The professors for the time being do not receive adequate remuneration from the fees of the pupils, and a subsidy must come from some quarter. It does not seem unreasonable that the parent society, which has been so long sustained, and whose coffers are now replenished mainly from the provinces, should meet these requirements in a friendly and liberal manner; instead of which, a grant of books or apparatus is made, which does not meet the difficulty referred to. I think it will be found impracticable that all our young men should go up to the school at Bloomsbury Square to obtain the qualifications necessary to pass the Minor examination, and I venture to suggest that there is needed an organization on a broader basis than hitherto, and that the Council should establish certain educational centres in various parts of the country in connection with local associations, and give such schools pecuniary help until they can be made self-supporting.

Perhaps you will kindly give this subject your consideration, and, if you think it of sufficient importance, take the opinion of the leading men of your association.

To promote the object, several courses of action are open:—

1st. To make an united representation of our opinions, either by letter or deputation, to the Council of the Pharmaceutical Society.

2nd. To jointly select and send such men to the Council as would support the interests and opinions of the country chemists.

3rd. That a meeting of delegates from each association in the midland and northern counties be held in a central town, such as Manchester or Leeds, to confer on this and other trade matters.

The latter course I think the most desirable and effectual.

Please reply at your earliest convenience, and say if your association would be prepared for any action.

I am, dear Sir, yours truly,

W. V. Radley,

President of Sheffield Pharmaceutical and Chemical Association.

The Pharmaceutical Journal.

SATURDAY, MARCH 30, 1872.

Communications for this Journal, and books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*
Instructions from Members and Associates respecting the transmission of the Journal should be sent to ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*
Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE PHARMACIST'S RESPONSIBILITIES.

THERE are still, we believe, some lessons to be gathered from the Devonshire poisoning case reported and commented on in last week's Journal. We closed our notice of this case then with this remark:—"Chemists should not only be themselves duly qualified, but should insist that every person entrusted by them to dispense medicines should be qualified also, if not by examination, at least by proper tuition and practice."

Nothing, it still seems to us, can be more obvious than this. It would be a mockery of all justice to that "public" over whose interests the legislators of St. Stephen's watch with so much zeal, were there no obligation, moral or legal, laid upon the proprietors of our pharmaceutical establishments to place in them assistants duly qualified to conduct, in their master's absence, the dispensing portion of their business. It is not enough that the captain of the Great Eastern be himself a competent seaman; the pilot and engineer must also be proved and attested masters of their respective departments. It would avail but little for the safety of the great ship or of its freight, animate or inanimate, though the right orders be issued by the captain, were these, through "ignorance or carelessness" on the part either of the pilot or engineer, not given effect to on their being issued.

At present there is no legal obligation laid upon the master druggist as to the qualifications of his assistants. No doubt, in all our larger and better class of pharmaceutical establishments, the master does, both on principle and from policy, insist upon his assistants possessing a measure, more or less sufficient, of skill in, and a knowledge of dispensing, before he entrusts them with the dispensing of prescriptions. The fact of being himself legally responsible for every act done in his premises by his assistants, and that, as consequent on this responsibility, heavy damages, direct and indirect, may at any moment be laid upon him, is, doubtless, a powerful incentive on the master to see that his assistants do possess a sufficient knowledge of dispensing before he admits them to situations of trust.

It is, probably, too soon to moot the question, though we believe it must, and ought to be raised by-and-by;—Shall not *every dispenser* of a prescription, and every person entrusted with the sale of poisons *used as medicinal agents*, whether master or servant, be bound to pass some examination before being allowed to do either of these acts? When that good time comes, and not till then, can we hope to see an end put to the keeping of "open shop" by those surgeons and doctors of medicine who now, as a rule, leave the work of their shops to be carried on by boys, men, or women who, in ninety-nine cases out of a hundred, are by no means fitted for the responsible duties with which they are entrusted.

Nor till then, we fear, will there be any hope of the master being freed from the legal responsibility attaching to him (nor do we say that till then he ought) for the acts of his assistants, however numerous, or with whatever care they may have been selected. We by no means wish to remove any of the safeguards that the public are entitled to claim for the careful conducting of the very onerous and responsible business of the pharmaceutical chemist, but we do think that *even now* the master who puts behind his counter only men who have passed the Major, or even the Minor examination, as fixed by law and carried out by officers sanctioned by Government, should be freed from the *legal* responsibility under which he at present lies for their acts. Even when freed from this, there would still remain an amount, and a kind, of responsibility on the master from which the proprietors of other businesses are, happily for them, altogether exempt.

PROVINCIAL EDUCATION.

WE are indebted to Mr. RADLEY for being able to publish on the opposite page the letter which he, as President of the Sheffield Pharmaceutical and Chemical Association, has sent to various other local Associations. The attention now being directed to the subject of pharmaceutical education in the provinces appears to have been in some measure the result of this letter; and as it has been several times referred to, its publication in the Journal seemed to be desirable.

THE PUBLIC HEALTH BILLS.

AT a Conference on Thursday, March 21st, of the joint committee of the British Medical and Social Science Associations, recently formed to consider the Bills relating to the public health now before Parliament, several members of Parliament being present, eight points were indicated by Dr. A. P. STEWART, one of the honorary secretaries of the committee, the attainment of which was thought to be desirable. They were to the effect that sanitary administration should be vested in the Local Government Board, assisted by a Council of Health; that a pledge should be given by the Government to attempt next session the consolidation of existing sanitary laws; that in lieu of the division of local authorities into urban and rural, there should be one local authority under one law in each sanitary district; that there should be one uniform high-class sanitary authority, in whom should be vested (subject to Local Government Board supervision) the power of directing and overlooking the administration of medical relief, establishment of dispensaries, the arrangement of districts, etc.; that such authority should be empowered to appoint one or more medical officers of health in chief, whose whole time shall be given to their official duties, and who may act as deputies to the chief officers of health; that sickness returns should pass through the hands of the chief medical officer for summary and local utilization, and that a moiety of the expenses should be borne by the Imperial exchequer. It was decided that an interview with Mr. STANSFELD should be sought before it was decided whether the Associations should oppose the Bill on the second reading, or whether the amendments should be moved in Committee.

THE last evening meeting of the present session will be held on Wednesday next, April 3rd, at half-past eight o'clock. The papers to be read on that occasion are, "The Weights and Measures used in Pharmacy," by Mr. C. H. WOOD, F.C.S.; "Pharmacy in Austria," by Mr. T. GREENISH; and "The Occurrence of Copper in Cajuput Oil," by Mr. EDWARD HISTED.

M. LEFORT has been nominated a member of the Paris Academy of Medicine in the section of pharmacy.

Provincial Transactions.

MANCHESTER CHEMISTS' ASSISTANTS' ASSOCIATION.

The ordinary Fortnightly Meeting of the above Association was held at Mitre Chambers, March 12th; the PRESIDENT in the chair.

A very able and interesting paper was read by Mr. COOPER, on the "Salts of Mercury;" some of the processes and tests being given practically. Afterwards a lively discussion of the subject was maintained.

The next meeting was to be held on March 26th, when a paper was to be read by Mr. Fewster on the "Preparations of the Natural Order *Papaveraceæ*."

NOTTINGHAM AND NOTTS CHEMISTS' ASSOCIATION.

The Fifth General Meeting was held in the Society's rooms, Britannia Chambers, on Friday, 15th March; the President, Mr. J. H. ATHERTON, in the chair.

The minutes were read and confirmed, and the following donations were announced:—A complete collection of the medicinal barks of the Pharmacopœia, from Mr. Fitzhugh; a series of microscopic slides, from Mr. Woolrich; the PHARMACEUTICAL JOURNAL, from the Society.

A letter was read from the President of the Sheffield Association, respecting the inadequacy of the aid given to provincial educational societies by the Council of the Pharmaceutical Society.

Resolutions were passed cordially approving of the action of the Sheffield Chemists' Association in the matter, and the President and Vice-President were appointed delegates to represent the Nottingham and Notts Association at the proposed conference of provincial societies. A paper was then read by Mr. MAYFIELD, on the "Adulteration of Drugs," of a very practical and interesting nature; after the discussion—in which the President, Mr. W. H. Parker (Vice-President) and Mr. Rayner took part—a cordial vote of thanks was unanimously accorded to Mr. Mayfield.

GLASGOW CHEMISTS' AND DRUGGISTS' ASSOCIATION.

The Meetings of this Association have been held at intervals throughout the winter. At a recent meeting Mr. ARCHIBALD PATERSON read a paper on "Our Writing Fluids," in the course of which he contrasted the ink used by the ancients with those of the present day, showing that the former was more durable on account of the carbon it contained. He then proceeded to describe the mode of preparing ink, and gave the proportions of ingredients found most suitable in its preparation. He gave a number of formulæ for different inks, amongst which was that recommended by the late Professor Penny, and manufactured on the large scale by Messrs. Duncan Flockhart and Co., of Edinburgh. Mr. Paterson drew attention to some of the peculiarities of this ink:—1st, the excess of galls; 2nd, the small proportion of iron; 3rd, the absence of gum; 4th, the presence of free sulphuric acid; 5th, the colour, blue, becoming black; and 6th, the process of exhaustion, viz. the cold-water maceration. Its chief fault, however, was the presence of free sulphuric acid, which, he said, must, in course of time, injure the paper upon which it was used, demonstrating his remarks on this point by experiment. Mr. Paterson afterwards drew attention to the so-called sympathetic inks, which he also illustrated by examples, and concluded by referring to the beauty and variety of colour possessed by the products of coal-tar, when used as writing fluids.

On Wednesday evening, March 20th, Mr. WILLIAM M'KENZIE read a paper on "Æther Sulphuricus." He referred at the outset to the ethers which are producible from alcohol by distillation with acids, and explained how ethyl (C_2H_5), or Et_2, can assume the properties of a base, and showed that it was the base of a system of compounds, viz. oxide of ethyl (Et_2O), common ether; nitrite of ethyl ($EtNO_2$), which when dissolved in spt. vini rect. forms the spt. eth. nit. of commerce; acid sulphate of ethyl ($EtHSO_4$), generally met with in the preparation of ether; the iodide (EtI); the hydride (EtH); the acetate ($Et\bar{A}$), and other salts of considerable chemical interest, but not used in medicine or pharmacy. He then went on to explain how other substances formed compounds with ethyl, stating that wines owe much of their bouquet or rich flavour to the presence of what is termed œnanthic ether. The flavour of whisky, he said, was due to pelargonic ether. He understood that this was now being manufactured by a secret process, and sold at a high price, for the purpose of imparting the fragrance of old whisky to new. Mr. M'KENZIE then referred to the flavours of fruits and the odours of flowers, all of which he said could be produced artificially by mixing these ethereal salts in different proportions. He then described the process of manufacturing the oxide of ethyl, or sulphuric ether, pointing out the great care required in its preparation, and concluded by describing some of the peculiarities in its properties, and uses to which it is put.

The early closing question has been discussed at almost every meeting this session with much spirit. The assistants have taken up the matter themselves in earnest, and the result is that the chemists on the south side of the river commence closing at 8 o'clock on the 1st of April, and it is hoped that the outlying districts on the north side will also be induced to take the benefit of the early hour as well. It is but fair to say that this result has been attained chiefly by the efforts of the Acting Committee of the Chemists' Assistants' Association.

NORTHAMPTON CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

The Monthly Meeting of the above Association was held on March 22nd in the room in College Street; Mr. Masters (President) in the chair.

The Secretary (Mr. Druce) read the minutes of the previous meeting, and said the Association had received during the month, the 'Calendar' and current number of the Journal, from the Pharmaceutical Society; a gas stove, from Mr. Clarke, and crystals of sugar of milk, from Mr. Berry.

Mr. Lance read an interesting and suggestive paper on the "Relation that ought to exist between Principals and their Assistants and Apprentices," dealing with the subject in a very practical and forcible manner. He thought that with a little more attention paid to employés in domestic as well as business arrangements, a mutual reciprocity of feeling would ensue, alike profitable to the principal and pleasing to the assistant. After the discussion on the paper,

Mr. Osborne exhibited through a large binocular microscope, fitted with polariscope and selenite stage, crystals of barii chlor., salicine, magnes. sulph., potas. nit., and soda tartarata, the latter being especially beautiful; several objects were then shown under an $\frac{1}{8}$ in. objective of very superior defining powers.

A hearty vote of thanks to Mr. Lance for his paper, and to Mr. Osborne for the trouble he had taken, concluded the meeting.

ABERDEEN SOCIETY OF CHEMISTS AND DRUGGISTS.

A course of lectures for the summer session of 1872 has been announced to be delivered by Dr. Beveridge at the School of Pharmacy in connection with this Society. They are to be of an elementary character, chiefly applicable to apprentices, the subject being "The Practical Study of Materia Medica with the Chemistry and Botany of the Pharmacopœia." The course is to be commenced on Monday, April 15th, at 9.30 a.m., and will be continued every Monday, Wednesday, and Saturday until the 13th of July. Fee for the course, 15s. There is also a library belonging to the Society which contains a selection of standard works on the above subjects, and is open every Friday evening from 8 to 10 o'clock. The employers earnestly recommend their apprentices to avail themselves of these lectures specially provided to assist them in qualifying themselves to pass the examinations of the Pharmaceutical Society.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

March 21st, 1872; Dr. Odling, F.R.S., Vice-president, in the chair. In the course of the ordinary business the Chairman announced that the Faraday lecture would be delivered by Professor Cannizzaro, on Thursday, 30th of May. A communication from M. Maumené, of Paris, was then read by the Secretary, in which he denied the existence of the hyponitrous acid recently discovered by Dr. Divers ('Proceedings of the Royal Society,' xix. 425), on purely theoretical grounds, unsupported by any experiments or analyses. Dr. Divers, who was present, kindly explained M. Maumené's theory. An interesting discussion took place on theoretical points connected with some remarks made by Dr. Debus, in which he stated that no organic compound existed in which the number of atoms of hydroxyl (HO) was greater than the number of carbon atoms.—The Anniversary Meeting of the Society for the election of officers and council will be held on Saturday, the 30th of March, and the next ordinary meeting on Thursday, 4th of April, when Dr. Schorlemmer, F.R.S., will deliver a lecture on "The Chemistry of the Hydrocarbons."

PARIS SOCIÉTÉ DE PHARMACIE.

A sitting of this Society was held on Wednesday, February 7th, under the presidency of M. Stanislas Martin.

M. Bussy presented a note from M. Carles upon the efflorescence that forms upon vanilla, in which it was stated that this substance is a peculiar organic acid, $C_{16}H_{3}O_{4}$, forming well-crystallized iodine compounds.

M. Boudet presented a paper, by M. Roucher, "On the Relations between Medical Men and Military Pharmaciens." He said that, notwithstanding the success with which M. Poggiale had formerly asserted the position of military pharmaciens, there had been attempts recently to subordinate pharmacy to medicine, or even to entirely suppress the pharmaceutic service in the army.

M. Poggiale, in the name of military pharmaciens, thanked M. Boudet for calling attention to the subject.

M. Bussy gave an account of the recent debates on fermentation in the Academy of Sciences; and M. Buignet described the investigations made to obtain crystallized digitaline which have gained the author the Orfila prize for the year.

M. Marais referred to a singular alteration observed in the leaves of *Cerasus Laurocerasus* upon the lowering of temperature to 22° below zero towards the end of the year 1871. The stem of the plant having frozen, the alteration extended from the petiole to the edge of the leaf, rarely from the margin to the central part. Immediately after the frost the leaves still yielded volatile products; but the nutrition being stopped, they no longer furnished hydrocyanic acid upon distillation.

M. Bussy said that it would be interesting to ascertain whether the emulsin alone underwent alteration.

M. Bourgoin and M. Gobley remarked that that could easily be ascertained by treating the bruised leaves with milk of sweet almonds.

Parliamentary and Law Proceedings.

Alleged Poisoning by Atropine.

Crown Court, Manchester.

Before Mr. Justice Lush.

On Thursday, March 21, Hannah Steele was indicted for the wilful murder of Andrew Harris.

Mr. Hopwood and Mr. Addison were for the prosecution; Mr. Torr, Q.C., and Mr. Thurlow for the defence.

It appeared that the deceased had been senior surgeon of the Manchester Workhouse, and that the prisoner was head of the female lunatic ward there. On the 10th of January last the deceased, who up to that day had been in perfect health, was shortly after breakfast taken suddenly ill, and, becoming rapidly worse, ultimately died at 8 o'clock in the evening; and the case for the prosecution was that he was poisoned by atropine, which had been put by the prisoner into the milk served to him at breakfast time. Atropine was stated to be used in some of the wards for treatment of diseases of the eye; and one of the doctors said that it was usual to serve it out to such of the officers as required it for that purpose in small phials containing a drachm apiece, which were labelled poison. It further appeared that Mrs. Lythgoe and a Mrs. Clark (each of whom was an officer in the workhouse) had tasted the milk served to Dr. Harris, and had suffered severely in a manner indicative of poisoning by atropine, although they ultimately recovered, one of them after two months' treatment in the hospital and the other more speedily. The doctors who were called swore that the symptoms in Dr. Harris's case were such as are exhibited in the case of the administration of atropine, and a phial on the doctor's mantelpiece was found one-third full of spirits containing some of that substance in solution, while the *post-mortem* examination pointed conclusively to the same result.

A great many witnesses were called, including the matron and the master of the workhouse, and it was proved that the prisoner had been in the room of Dr. Harris that morning after the milk had been taken there from the kitchen as usual, and that she knocked at the door as she went in; as, also, that she was there subsequently, about 9.30, while the deceased was at breakfast; and in order to show a motive, it was proved that two days before the occurrence Dr. Harris had complained of the prisoner to the authorities for not reporting a case of illness in proper time, and that they had reprimanded her. A witness also stated that on that occasion the prisoner had said on leaving the room, "Dr. Harris has been telling a good few lies; I'll give him enough reporting before the week's over." But as to this it was proved on behalf of the prisoner, as also by way of accounting for her presence in the doctor's room, that it was her duty to report to the doctor every morning any case of illness which might arise in her ward, and after leaving certain papers relating to such cases there for his signature, to return and take them to the chaplain; and, further, that on the morning in question there were papers to which it was her duty to obtain the doctor's signature, and a conversation which had been overheard indicated that she had asked for the signature, but that the doctor had declined to give it. It was, however, made out that the poison must have been put into the cream jug after it had been taken to the deceased's room, and the prosecution insisted that in addition to the actual fact of her presence there that morning, the prisoner's guilt was proved first by her behaviour after the occurrence, and by certain expressions used by her to the two women who tasted the milk, and, secondly, by a statement made by the doctor when in a dying state, which, after some discussion, his Lordship admitted as evidence, and which was to the effect that he thought Mrs. Steele (the prisoner) had done it: and that hearing some one move in his sitting-room that morning while he was washing in his bed-room, he had opened the door and seen the prisoner standing there; and that the phial had not been there the night before.

For the prisoner it was contended that the offence had not been brought home to her; that the evidence of the witnesses for the prosecution was uncertain and contradictory; and that the behaviour of the prisoner had been entirely that of an innocent woman who had nothing to conceal. Further, that considering the frequent use in the workhouse of the poison in question, its presence in the cream jug might be the result of carelessness on the part of one of the nurses. Witnesses were also called, who gave the prisoner a good character. The doctors who were called stated that atropine is an extremely deadly poison, and that even the hundredth part of a grain of it is sufficient to injure life. It should be added that since the fatal occurrence the system under which the phials containing this poison were carried freely about by the nurses has been discontinued, and that it is now kept under lock and key.

After a careful summing up by the learned Judge, the jury retired for a short time, and eventually acquitted the prisoner.

POISONING BY MRS. WINSLOW'S "SOOTHING SYRUP."

An inquest was held at Wandsworth on Tuesday, March 19th, before Mr. Coroner Carter upon the body of a child aged two years, who died suddenly on the 15th inst. Dr. Hooper stated, in evidence, that the child had been suffering from cerebral disease, and that death was caused by an overdose of Winslow syrup. A verdict was returned in accordance with the evidence.—*Wandsworth and Battersea Times.*

Review.

A DICTIONARY OF CHEMISTRY AND THE ALLIED BRANCHES OF OTHER SCIENCES. By HENRY WATTS, B.A., F.R.S., F.C.S. Assisted by Eminent Contributors. Supplement. Longmans, Green and Co. 1872.

It was a bold idea, but no less a happy one, which inspired Mr. Watts when he thought of putting the whole of chemistry into a dictionary. Probably no other scheme would have met the requirements of chemists so satisfactorily, or have proved so thorough a success in every way, notwithstanding the unfavourable circumstance that it was produced at a time when the science was passing through a series of rapid and profound revolutions. Nevertheless, whilst it at once comprehended all other works, and, so far as English chemists are concerned, almost displaces them, it became obvious long before the publication of the last of the five annual volumes, that a supplement was essential, if only to render the original work complete. Hence the volume before us.

But chemistry, if not yet an exact science, is one of the most prolific conceivable fields of research, and as each year rolls by, a vast body of facts, to say nothing of theories, is placed upon record. It is difficult to say what we are to do with this crowd of observations unless they can be rendered accessible. In Germany they have long had the 'Jahresbericht,' a work which is much appreciated, even in this country, as a chronicle of the progress of chemistry throughout the world. The last part of the issue for 1869 has not yet made its appearance, so that in this "Supplement," "which brings the record of chemical discovery down to the end of the year 1869, including also several additions to and corrections of former results, which have appeared in 1870 and 1871," we have fairly the start of the 'Jahresbericht.' What we now want and sincerely hope to see is an annual Supplement like the present, to serve as a Year-Book of Chemistry and the English representative of that work. For this task there is no one so competent as the editor of the Dictionary, whose extensive acquaintance with chemical literature could not be more usefully employed.

Before proceeding to notice the contents of the Supplement before us, we must express a feeling of regret that articles of a merely general character, on heat, light and electricity should have been included in the Dictionary. The space they occupy in some of the earlier volumes necessitated extreme condensation of more special matters in the later, which detracted considerably from their completeness. And we think it desirable that future articles on physical subjects should be rigidly restricted to treatment of those observations which have a direct relation to chemistry.

The progress of chemistry during the last few years has been marked chiefly by the establishment of the spectroscope as an ordinary instrument of research, by immense developments in the chemistry of carbon compounds, commonly called organic chemistry, and by the very free use of graphic forms of notation. This last circumstance seems to indicate, on the part of the majority of chemists, a conviction of the utility, if not the absolute truth, of the atomic theory. It is a fact that, contrary to a statement recently made by a speaker at one of the meetings of the Chemical Society, molecular ideas have implanted themselves very firmly in the minds both of chemists and physicists. With the latter, indeed, the existence of molecules, or physical atoms, is no longer a matter of question, several distinguished men having gone so far as to calculate the limits within which the magnitude of molecules must lie. It is much to be regretted, however, that the tendency of thought with regard to the ultimate constitution of bodies is still so distinctly statical. We have much reason to believe that even atoms which are united together by chemical bonds are in motion, and that the atoms constituting a molecule are to a certain extent free to move about, and do move around or amongst each other. As to certain knowledge, however, concerning the nature of the force which binds them together, and of the laws which regulate chemical action, we possess but little more than the chemists of half a century ago, and we really seem to be making but feeble efforts to get out of this condition of stagnation. It is true that thermo-chemistry is being at the present time prosecuted with a little more activity, but in every laboratory the phenomena accompanying chemical reactions need to be more carefully observed and recorded before we can hope for further light in this direction.

In the Supplement to Watts's 'Dictionary' we notice a valuable article on atomicity, the moderate tone of which is commendable. The existing condition of the subject shows how inadequate are our systems of notation to figure, with even a semblance of probability, the true nature of chemical compounds.

There is always some good, however, in a theory the use of which leads to practical results; and it may be said with truth, that the study of abstract formulistic chemistry has rendered great and valuable assistance in exploring new regions and discovering new compounds. No more striking example of this could be cited than the comparatively recent formation of alizarin, the colouring-matter of madder, by a synthetical process, which is now worked on a manufacturing scale.

Turning to that very important subject—the production of iron—we find that nothing of importance, so far as the chemistry of the matter is concerned, has been added since the publication of the dictionary, but some space is very properly given to a description of Siemens' valuable "regenerative gas furnace," and its application to the production of steel.

In the department of physical chemistry science had to deplore, in 1869, the loss of Thomas Graham, to whose researches we owe almost all the precise knowledge we possess of atomic motion. His later experiments on the passage of gases through colloid septa, and the absorption of some gases by certain metals, receive due mention.

Then a place is accorded in this volume to spectral analysis, the application of which to the examination of the light from the celestial bodies is of so great interest that we can hardly grudge it space, although, strictly, it has little to do with chemistry, and is chargeable with having lured more than one chemist of distinction from his allegiance to his own department of science. A review of Watts's 'Supplement' is sufficient to show how serious have been the results of this neglect of general chemistry. In this our day, in fact, there is a deficiency of that spirit which animated the earlier chemists. There is not much hope of great advance whilst the philosophers are more intent on discovering the road to fortune than on treading those high paths to which the labours of Berzelius and Gay-Lussac, Liebig and Dumas ought to have taught us to aspire. We feel almost tempted to exclaim:—

> "Those suns are set. O rise some other such!
> Or all that we have left is empty talk
> Of old achievements, and despair of new."

Zanzibar: City, Island and Coast. By Richard F. Burton. 2 vols. London: Tinsley Brothers. 1872.

This work deals with a far more limited area than most of the recent books on African travel and research. The first volume is almost entirely occupied with the island of Zanzibar itself, including a description of the natural features of the island, its climate, natural productions, both animal and vegetable, the ethnology of its native tribes, and a slight sketch of its history; while the second volume gives details of some short excursions along the coast and in the interior of the mainland, but covering only a comparatively small district. Great credit is due to Captain Burton for the zeal with which he has pursued his researches in so unpromising a field, under a climate particularly trying to Europeans, in a country without any special features of attraction, and among native tribes whose habits and personal appearance are repulsive in the extreme. What we are most concerned with is, however, any additions which the author may have succeeded in making to our knowledge of the economical productions of the country. These are not numerous; but there are some points of interest.

The prosperity of the island has hitherto depended on the cocoa-nut and the clove-tree. There is an Arab saying, that the cocoa-nut-palm and the date-palm cannot thrive together, and this is fully exemplified at Zanzibar, the latter not being a product of the island. The cocoa-nut supplies the natives, not only with food, wine and spirit, but also with syrup and vinegar, cords, mats, strainers, tinder, firewood, houses and palings, boats and sails, in short, all the wants of barbarous life. Every part of it may be pressed into man's service, from the sheath of the first or lowest leaf, used as a sieve, to the stalk of the young fruit, which, divested of the outer coat, is somewhat like our chestnut. As many as twelve million nuts have been exported in a single year for the soap and candle trades. The true oil-palm (*Elais guineensis*) does not grow on the island. Cotton is said to thrive on the island, but the climate is not favourable. Coffee has been attempted, but has been driven out by the clove. There are two distinct trees which produce caoutchouc. The tamarind, as in India, is a splendid tree, but the fruit, though used for acidulated drinks, is not prepared for exportation. A smooth-rooted sarsaparilla, of lighter colour than the Brazil or Jamaica article, is found wild upon the island and the coast. The orchilla, which gives its name to the Insulæ Purpurariæ, has been tried, and, resembling that of the Somali country, it gives good colour. The favourite fruits of the natives are the mango, orange, banana, pine-apple and bread-fruit. The grains in most common use are the maize and sesamum.

But the most important commercial product of the island is the clove, which was introduced from Mauritius and Bourbon in 1818. The industry, however, is neglected; from the natural indolence of the native tribes, the trees are not properly trimmed, and the produce is inferior in quality to that of Bourbon or the Moluccas, and not above one-fourth in quantity of what it should be. Nevertheless, as long ago as 1859, the crop amounted to seven million pounds, valued at £85,000.

Captain Burton paid a special visit to the Copal field of Sa'adani, on the coast of the mainland opposite Zanzibar. He confirms the statement of Dr. Kirk, that the Zanzibar copal-tree is the *Hymenæa verrucosa* of Boivin, called in the native language Msandarúsi. It grows in thickets, to the height of about 30 feet, and measuring about a yard in girth, upon flats covered with mimosas, Hyphænes and various other palms. The gum exudes from the bole and boughs when injured by elephants or other causes. This is the Chakazi, raw copal, whence the local English name "jackass copal." It has rarely any "goose-skin," and it floats, whilst the older product sinks, in water. It produces the magnificent varnishes of China and Japan. Dr. Kirk states that the fossil resin when first dug up shows no trace of the characteristic "goose-skin," which appears only when the surface is cleaned by brushing. Captain Grant's statement, that "the true copal-gum is a climber which ascends to a great height among the forest-trees, and finally becomes completely detached from the original root, when the copal exudes from the extremities of these detached roots," must refer to some entirely different plant. The bitumenized and semi-mineral gum is dug out of the loose sand. A pit is sunk about 3 feet deep, the earth becomes gradually redder, crimson fibrous matter appears, and presently the ground appears to be half sand, half comminuted copal. The copal of commerce is produced along the whole coast for a distance of probably 800 miles, and at varying distances into the interior. Captain Burton found it impossible, however, to trace the position and circumstances of the extinct forests of which copal constitutes the principal remains; as such an investigation would have entailed at least two months' voyaging along and dwelling upon the fever-haunted sea-board. The value of the trade, which might be very great, is kept down by the indolence of the natives, and by injurious monopolies.

At the end of the second volume are several useful Appendices, containing notes of thermometric and meteorological observations, and an epitome of the commerce of Zanzibar between the years 1857 and 1859. The staple productions of the island are stated to be cocoa-nuts and cloves; while the coast of the mainland produces slaves, copal, ivory of the finest description, hides, curries, rafters, red pepper, ambergris, beeswax, hippopotamus' teeth and rhinoceros' horn. In 1859, the reports of H. B. M.'s consul (probably much understated), give the value of the export of ivory at £146,666, of copal at £37,166, and of cloves at £55,666. The exports are chiefly to the Continent of Europe (there is none direct to Great Britain), the United States, Hindostan and Arabia; while the imports consist mainly of English, American and Indian cottons, arms and gunpowder, china and iron-ware, and bullion. There is also a large and curious trade in Venetian beads, which is very variable, each district having also its peculiar favourite variety, and refusing to take any of the 400 kinds except those which may happen to be in fashion.

The book is furnished with a good map, illustrating our present knowledge of the country as far as the great Victoria N'yanza, and with a few woodcuts, which we cannot describe as a great embellishment to it.

Obituary.

LOUIS-RENÉ LE CANU.

The following particulars of the biography of the late Dr. Le Canu are taken from the funeral oration pronounced by his friend and pupil, Professor Chatin, December 22nd, 1871.

Louis-René le Canu, Professor at the School of Pharmacy, Member of the Council of Public Hygiene for the Department of the Seine, Member of the Academy of Medicine, Officer of the Legion of Honour, of Public Instruction of the Order of Charles III. of Spain and of Villaviciosa of Portugal, Commander of the Order of Santa-Rosa of Honduras, etc., was born at Paris the 18th of November, 1800. His father was Jacques Louis Toussaint le Canu, of Périers, formerly chief pharmacien of the Salpêtrière and of the general hospitals of Paris, who sent him to pursue his studies at the Lycée Charlemagne, where the young scholar had for his friends and rivals M. Baroche, who afterwards held an important position under the second empire, and M. Littre.

On leaving the college, where he had been extremely successful, he entered the laboratory of M. Thénard. Here his quick intelligence, his industry, and the charming qualities of his character won for him the honourable post of superintending the chemical operations and the lasting friendship of M. Thénard. The admiration and love which his somewhat austere master had for him was shown some years after, when, upon an occasion of dining with some friends, M. Thénard said, "Le Canu, I have always loved thee well; but thou knowest I would have renounced thee hadst thou deviated ever so little from the right path."

The valuable investigations which Le Canu carried on in the laboratory of the College of France, sometimes alone, frequently with his friend Bussy and now and then with Serbat, attracted to him the attention of chemists, and gained for him, while still young, appointments that are not generally attained until a riper age, such as his professorial chair at the École de Pharmacie, and his membership of the Académie de Médecine and of the Conseil de Salubrité. Of this latter body he was one of the oldest members, and in connection with it he made many very valuable reports.

As a professor, Le Canu was very successful. His diction, which, while pure and flowing, was also animated and picturesque; his face expressive, intelligent and sympathetic; his manner engaging and keeping his auditory always on the alert; the well-known qualities of his heart,—all combined to secure a good attendance at his classes, and to make him very popular with his pupils. But while yet in full prosperity, in apparent health and with his intellectual faculties undimmed, he announced, to the surprise and profound chagrin of his colleagues, his intention to resign. He seems to have wished to retire from his work before his auditors were tempted to leave him, and ere his professorial reputation became dimmed through waning powers. He retired into country life and devoted himself to agricultural researches; amongst other subjects he made known a new process for the fermentation of wine.

The scientific labours of Le Canu were very numerous. Besides his important researches on urine, he followed up the study of the fats in which Chevreul had made so great a reputation, and in conjunction with Bussy, made several important and useful discoveries. These, however, were but the prelude to his great work on the blood, in which he no longer travelled a beaten road, but by the extent and plan of the researches he initiated, no less than by the results he obtained, raised a lasting monument to his memory.

The 'Cours Complet de Pharmacie' followed these original labours of Le Canu. Well conceived, and still better written, this work shared the popularity of Soubeiran's 'Traité de Pharmacie,' and was translated into several languages. It was notably received with favour in Spain, and is still, after the lapse of a quarter of a century, the guide of pharmaceutical and medical students in that country. He also published a small volume entitled 'Leçons de Géologie.'

While still young, Le Canu married a daughter of M. Labarraque, a distinguished pharmacien and the author of several well-known researches. With this lady, by whom he had two daughters, he lived in great happiness at Licérasse in the Basse-Pyrénées, until the occurrence of the calamities which have recently overtaken France. Shortly after Madame le Canu died, and in the hope of mitigating the loss by change of scene, M. le Canu accepted an invitation of a former pupil, Professor Ramon Muñoz de Luna, to visit Madrid. Here he was presented to Marshal Serrano and other dignitaries of the country, from whom he received the most flattering courtesies. The faculties of science, medicine, and pharmacy also, each voted addresses of welcome, which were presented by a joint deputation of twelve of their most eminent members. But a more striking welcome awaited him, upon the occasion of his attending one of Professor Muñoz de Luna's lectures at the University of Madrid. The great amphitheatre was filled by a body of about fifteen hundred students, and scarcely had Le Canu taken his seat when the roof shook with three tremendous *vivats*, which were renewed with redoubled force at the close of the lecture. On leaving the university he found the students drawn up in order, prepared to escort him to his hotel, and it was with some difficulty that he succeeded in escaping from further manifestations by stepping into a friend's carriage.

Returning to Paris, he attended a sitting of the Academy of Medicine, where he received the congratulations of his friends, glad to see him among them once more. But having been seized by a violent cold, he took to his bed; severe pneumonia set in which developed very rapidly; the attack was too much for his already enfeebled frame, and in a day or two he was no more.

Notes and Queries.

*** *In order to facilitate reference, correspondents are requested to mark their answers in each case with the title and number of the query referred to.*

No notice can be taken of anonymous communications. All queries or answers should be accompanied by the name and address of the writer.

[307.]—DIAMOND CEMENT.—*A. M. B.* will find this a very good recipe:—Isinglass, soaked in water until soft, then dissolved in the smallest quantity of acetic acid by the aid of a gentle heat. In ℥ij of this, dissolve grs. x of ammoniacum, and add a solution of ʒss of mastic in ʒiij spirits of wine; stir well together.—JOHN TULLY, *Brighton.*

[308.]—COLOURING FOR VARNISH.—A solution of saffron in spirit is the best to give a yellow colour to shellac-varnish; but a better way is, to first stain the wood by applying the solution to it and then varnish. —WM. ASHTON, *Sloane Square.*

IMITATION HONEY.—The *New York Druggists' Circular* states that an imitation of honey, consisting principally of glucose or uncrystallizable sugar, flavoured by elm leaves and other materials, is manufactured in large quantities. The glucose used in its preparation is mostly made in Europe from corn and potato starch starch, and is largely imported into the United States, the inferior qualities being used by brewers and distillers. It is dissolved in water, filtered, decolorized if necessary, concentrated by evaporation, and the flavouring material is then added.

[312.]—INCENSE.—*R. M. Atkinson* wishes to be furnished with a first-class formula for preparing incense as used for ecclesiastical purposes.

[313.] — MILDEW IN SAILS AND LINEN CLOTHS.—Can any of your readers inform me of the readiest way of removing the black mildew stains produced in sails and linen cloths that have laid by and become damp.—CHEMICUS.

The following journals have been received:—The 'British Medical Journal,' Mar. 23; the 'Medical Times and Gazette,' Mar. 23; the 'Lancet,' Mar. 23; the 'Medical Press and Circular,' Mar. 27; 'Nature,' Mar. 23; the 'Chemical News,' Mar. 23; 'English Mechanic,' Mar. 22; 'Gardeners' Chronicle,' Mar. 23; the 'Grocer,' Mar. 23; the 'Journal of the Society of Arts,' Mar. 23; the 'British Journal of Dental Science' for March; the 'Journal de Pharmacie et de Chimie' for March; the 'Moniteur Scientifique-Quesneville' for September and February; the 'Leavenworth Journal of Pharmacy' for March; the 'Journal of Materia Medica' for January and February; the 'Philadelphia Medical and Surgical Reporter,' Nos. 779 to 783; the 'Independencia Médica' (Barcelona) March 11; 'El Progreso Médico' (Cadiz) Feb. 15 and March 1; 'Wandsworth and Battersea District Times,' March 22; the Dublin Journal of Medical Science for March.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

ELECTION OF COUNCIL.

Sir,—I should be most unwilling to follow a practice which has (unhappily, as I think) been recently introduced into these elections, of putting out a faction list instead of leaving the issue to be determined by unprejudiced personal selection; but it is obvious that if this course is persisted in, it must be met by similar action in an opposite direction, otherwise the whole control of the Society will lapse into the hands of the most tumultuous element, which may or may not be the side of numbers, character or discretion. Let us hope that these tactics may not be repeated, but that for the future our members may be permitted to exercise their own choice of the men whose known qualifications afford the best guarantee for the creditable direction of the Society.

Notwithstanding what has just been stated, I venture to invite very seriously, but with extreme deference, the attention of my fellow-members to certain general considerations affecting the choice of Council. Many years ago, in a time of much difficulty, I had the honour of being upon the Council, and had the best opportunities of judging of the conditions requisite for its efficiency. I do not hesitate to say that one of the foremost of these conditions is, that there should be a sufficient proportion of London members, and I cannot doubt the assurances which I have received, that the recent reduction of the number of London members of Council has been attended with very considerable inconvenience. This seems to be a truism wanting no proof, and I need only call attention to the fact, that whereas the Board of Examiners, consisting of twelve members and meeting in London, is made up of ten London members and two country members,—the Council, of twenty-one members (also meeting in London and comprehending various Committees, which must depend greatly upon resident members), is composed of seven London members and fourteen country members. I may also remark that the contiguous towns of Liverpool and Manchester contribute three out of the fourteen country members, thus being represented to nearly half the extent of the metropolis of the empire, which is no less the metropolis of pharmacy. I am not aware what are the especial claims of Lancashire to this extraordinary preponderance of pharmaceutical representation, though we all know by what means it has been accomplished.

In connection with this subject, I will take the liberty of stating the opinions which I had formed and acted upon when myself a member of Council in 1854. It appeared to me then that there was such necessity for a considerable majority of the Council being resident in London that there could only be a limited number of seats available for provincial representation, and that, in order that all important districts should be brought into close affinity with the central government, these seats should not be long held in the same town. To these general opinions I adhere; and I do not think that small towns (except under very exceptional circumstances) should continue to monopolize the representation, which might with more advantage to the Society and to the provinces circulate from town to town from time to time. With these sentiments, it will be understood that I could not be favourable to the election of two members of Council from the same provincial city; and with all respect to good friends unknown, who have repeatedly nominated myself in opposition to feelings which they have afforded me no opportunities of explaining, it was impossible that I could become a candidate for a seat more worthily filled by my highly-esteemed friend and fellow-citizen, W. W. Stoddart.

There is one more matter for which I would ask the favour of an indulgent hearing. I have upon this occasion, for the first time, nominated a candidate for the ensuing election, in whose appointment I believe that the Society has a material interest. I am deeply grateful to that gentleman for waiving his objections, and, in a spirit of loyal citizenship, permitting me to nominate him after he had been once unsuccessfully brought to the poll. For the best interests of pharmacy, I hope that the coming election may be free from those disturbing causes which alone could render his candidature uncertain, either now or on the previous occasion.

I respectfully solicit a "fair field" for Mr. Charles H. Savory, and I am sure that, whether we regard his qualifications in a personal light, or as derived from the eminent firm of which he is now the chief, there can be but one opinion as to the desirability of associating him with the government of the Pharmaceutical Society. My early recollections of the Society recall to me the period when the late Mr. John Savory occupied the responsible post of President for four successive years, at a time when the Society derived strength from the reputation of those who were the sponsors of its young promise. At the same period his two sons were fellow-pupils with me at laboratory and lecture, and I cannot doubt that we shall renew with satisfaction the honourable relations of the past generation in the person of the present successor to the name and fame of his house.

Clifton, March 25th, 1872. RICH. W. GILES.

THE DEVONSHIRE POISONING CASE.

Sir,—Baron Bramwell, in summing up the Devonshire case of poisoning by muriate of morphia, reported in last week's Journal, states:—"No doubt if Sir William Jenner had, in plain, legible writing, described (prescribed) the salt, it would have been rather a bold thing for a chemist to have refused to make it up."

This bold thing was done by the writer some thirty-four or thirty-five years ago. The prescriber, then a young man, but now, a man of science, of as world-wide a fame as Sir William Jenner himself, sent in a prescription for dispensing, written in a "plain, legible" hand, for some drachms of "mur. morph.," without any prefix "sol." or "liq." though the solution was intended; and this, too, in circumstances that had the dispenser not done the very reverse of the Devonshire chemist's assistant, death might have been the result not only in one, but in many cases—the prescription having been written for the patients of a private hospital.

This case, and not a few others of a like nature, led me, among other things bearing on the qualifications of druggists and dispensers of medicine, to write, in a local journal, as far back as the year 1854, these sentences:—

"In all professions and in all trades it is found that, almost invariably, the best educated and best informed is also the best business man. Energy never long keeps company with ignorance in, at least, the special field on which the man of energy has entered. And surely, if a good education be found so necessary for success in other vocations, it must be absolutely necessary in the case of the druggist or the dispenser of our medicines. The public are, from time to time, startled from their propriety, by hearing of the fatal effects of wrongly-administered drugs. Now, while accidents in the dispensing of drugs will occasionally happen, even in circumstances the most favourable for their avoidance, how much more likely are they to occur with an ignorant dispenser? It is not enough, in order to avoid or to rectify mistakes, that the drug dispenser be merely careful and cautious. If a wrong quantity or a wrong article be prescribed or asked for, an intelligent, well-informed and careful dispenser will, almost invariably, be able to detect and expose the error."

After arguing for shortened hours that the education of our assistants might be properly cared for, I concluded with these remarks:—

"1. The public, for their own safety, have a deep interest in the character of their druggists.

"2. The medical men have a like interest in the matter. For the correction of possible error in, and for the correct reading of hurriedly, or all but illegibly, written prescriptions, it is manifestly requisite that the dispenser be familiar with the names, properties, and doses of the agents prescribed.

"3. The employers, or master druggists, have an interest in the matter, only inferior to that of the public, or to that of the medical men. A few serious mistakes committed by an ignorant assistant will quickly tell upon his employer's receipts."

The bearing of these remarks, eighteen years old though they be, on the case now under consideration, is too obvious to require application, and I believe should obviate the necessity of an apology on my part for troubling your readers with their reproduction at this juncture.

Glasgow, March 26th, 1872. DANIEL FRAZER.

PHARMACY IN THE LABORATORY.

Sir,—The article with the above heading by our respected President, couched as it was in language so extremely moderate as not to be likely to offend the susceptibilities of pharmacists so unfortunately placed as not to have room for a laboratory of any description, would I thought have met with the approval of every chemist desirous of improving the status of those following his occupation.

So far from complaining, as Mr. Ellwood does, that laboratory work does not pay, that few chemists possess the skill required for successful manipulation, and that the drudgery of the shop is quite sufficient to exhaust the energies of the ordinary chemist, I felt not quite satisfied that ground sufficiently high had been taken, or that enough had been said in favour of home manufacture.

I always was under the impression that the main object of the founders of the Pharmaceutical Society was the elevation of the trade of pharmacy to the rank of a profession, not by mere legal enactment,—that, indeed, would be impossible,—but by increasing the knowledge and skill of the compounders of medicine, and assimilating them somewhat to continental chemists, who, it is well known, are no mere drudges of the medical profession, but men of science and acknowledged status, ranking, in fact, with the members of other liberal professions.

Men of that calibre would very unwillingly use in their pharmacies medicines whose activity they could not guarantee, and consequently would, as far as possible, have prepared under their own immediate inspection all medicines whose strength and purity could not be easily and satisfactorily ascertained.

Again, the mere mixing of ingredients and sale by retail behind a shop counter, although necessary parts of a pharmaceutical career, would not afford sufficient scope for a mind well instructed in science, and conscious of being capable of higher things.

So far for æsthetical considerations.

As regards practice I can speak with confidence, for having a taste for laboratory work, and taking an interest in the chemistry of materia medica, I have for a country chemist of moderate business done a good deal of laboratory work, much to my own interest and amusement, and not a little beneficial, I believe, to my customers. My experience is so far different from Mr. Ellwood's, that I can state with truth that there are few galenical preparations in frequent use that cannot be better made at home than purchased abroad, and that in almost every case the cost of production is less than that of the best articles procurable in the market. Rare extracts, liquors and active principles should not as a rule be attempted. It is well, however, to prepare such once, so as to have a criterion whereby to judge of the article when purchased of the wholesale dealers. Of drugs in the whole state, one can by inspection tolerably well estimate the value; not so of preparations. The name of a well-known firm has some significance, of course, and it would be very unfair to suspect even the authenticity of its productions. But there are many types of wholesale druggists, and one cannot forget that, no matter how trashy a drug may be, let it be offered at a price, it will find a purchaser, and somehow disappear,—not in its crude state, we may be sure, *ergo* in one of its preparations.

Where a chemist is compelled to work his business single-handed, laboratory work is almost impossible; still an enthusiast can do a good deal on a side-counter with the aid of a gas furnace and water bath. Mr. Ellwood is quite mistaken in supposing that expensive apparatus is required for preparing spt. am. ar., spt. æth. nit. etc. My own laboratory is a very modest affair, contains no very expensive fittings (£100 would pay for the lot, I should think); yet I can always, when called upon, adapt it to any of the Pharmacopœial requirements, and do in it occasionally a little original research beside. I have just had occasion to move it, so it is now in a bit of a muddle; the furnace, copper and sand-bath not yet in position. When it is set straight, Mr. E., or any other man, is very welcome to inspect it.

I can well understand that there are few chemists who do as I do in this respect, for I have always remarked on the extreme rarity of assistants who have any useful knowledge of laboratory work. There I find an apprentice very handy, and with such assistance the master need not absent himself so much from his shop as to lose one way what he gains by the other.

I confess that I think the distilling of aromatic waters mere waste of time and trouble. Possibly some of them are nicer when so made than when prepared with the essential oils and precipitated chalk. The difference, however, is very slight; in a medical sense, quite imperceptible, and that is what we have chiefly to regard. Such refinement is more worthy of the attention of the book or liqueur maker than of the pharmacist. Let me finally express the hope that every chemist and pharmaceutist will, as far as in him lies, justify the former title by preparing for himself the drugs he dispenses, and so benefit—himself, by the interest added to his otherwise monotonous pursuits—the pharmaceutical body by the original observations that such work must occasionally give rise to; and, lastly, the apprentice, who will then, and not till then, have a fair chance of learning his business, and passing his examinations, without undue effort, or the pernicious aid of the professional grinder.

Thomas B. Groves.

Sir,—The subject brought forward by Mr. Haselden is one which affects the rising generation of pharmacists in no small degree. "The key to dispensing is a perfect knowledge of the substances dispensed." So writes Mr. Ince. Now, this kind of "knowledge" can only be obtained by actually making the preparations used; but, as Mr. Elwood truly observes, these cannot all be made either conveniently or profitably by the retail chemist; they require expensive apparatus and much time. But what shall we say of the diluted acids, the precipitated phosphates, arseniates, carbonates and iodides, many of the soluble citrates, tartrates and acetates, and their solutions? My experience of a country pharmacy has taught me that such preparations can be made both cheaply and well. And with regard to their cost, I may instance red iodide of mercury, of which I made half the quantity of the B. P. formula some months ago. The materials for making the theoretical yield (3·35 ounces) cost at that time 2*s.* 10*d.*, and as the article was quoted at 1*s.* 2*d.* an ounce, I saved about 1*s.* on the product. Other cases might be given, but one is enough to show that such operations can be performed with great intellectual profit to the student, and often gain to his master.

The same may be said of many galenicals, especially the expressed juices, and no preparation of that class has given so much satisfaction as succus taraxaci.

Where practice of this kind is afforded to the apprentice, the difficulty of many other processes will vanish; the appearance of some little-used chemical in a prescription will not disturb his mind. Young men in the trade, especially those preparing for examination, would be glad to avail themselves of such opportunities, especially when situated in country places where no school of pharmacy, with its attendant advantages, exists.

I might propose, too, the use of a laboratory journal by those who follow practical pharmacy, for noting down any observations which may come under notice, and comparing them with those of more experienced workers.

While seeking to raise pharmacy to its proper position, the student who has espoused its cause should never forget how much may be done towards this end by individual effort.

An Apprentice.

The Education Question.

Sir,—Reading over your article this week on "The Education Question," and seeing that you regret so little has been said on the subject, you will perhaps allow me to give you my idea on the question, as I have had a little experience in assisting both pharmaceutical and medical students.

1st. For my own part, I blush to think that any of our brethren would make the Preliminary examination any easier than it is; for if a young man considers it a difficult one, he must be without any idea of method in study; or else, so dull of comprehension that I fear he would never pass the "Minor," should he be allowed to go in for it *sine* the Preliminary. Indeed, the examination would be all the better if it comprised one in "elementary physiology," taking Huxley's 'Physiology' as the text-book, for it is not at all uncommon now, to come across boys and girls who are as well able to give you a description of the "circulation of the blood," the "function of alimentation," or of "the nervous system," as well as many a second year's medical student (of course, not anatomically); and surely if schoolboys and girls can do so, it is not too much to expect from pharmaceutical students. Again, take for example, the Oxford local examinations for juniors (boys or girls), no candidate being eligible who is more than fifteen years old. It is as follows:—

1. Reading aloud.
2. Writing from dictation.
3. The analysis and parsing of a passage taken from Milton's 'Paradise Lost,' book I. and questions suggested by the poem.
4. Writing a short English composition.
5. Arithmetic up to simple rule of three.
6. Geography. Every candidate will be required to answer questions on this subject, and to fill up an outline map of England and Wales, Scotland, Ireland, France, Spain and Portugal, or Turkey in Europe; by inserting the chief mountains, rivers, divisions and towns.
7. The outlines of English history.

Every candidate will also be required to satisfy the examiners, in two at least of the following subjects, viz.:—

1. The rudiments of faith and religion.
2. Latin. Cæsar (Bell. Gall. i. ii.). Virgil (Æn. iv.).
3. Greek. Xenophon (Anabasis i.) and Homer (Iliad i.).
4. French. 'Bertrand du Guesclin.'
5. German. Schiller's Ballads.
6. Mathematics. Euclid, book i. ii., and algebra to simple equations inclusive.
7. Mechanics and mechanism as embraced in statics, dynamics and hydrostatics.
8. Chemistry. Questions on the elementary facts; also substances will be given to be tested, each containing not more than one acid and one base.

The quality of the handwriting and the spelling will be taken into account; also the answers to the grammatical questions and translations of English passages into the respective languages.

Such, Sir, is the examination for boys and girls under fifteen years of age, therefore I ask is our pharmaceutical preliminary examination too difficult? I think that a great many students are "plucked," not for want of ability to study, or want of application, but simply for want of method; and I have been pleased, and surprised, in my short experience, to see them get on so thoroughly and surely (even those whom you would consider dull) by slow *methodical* perseverance.

2nd. In large towns and cities of this country, when such places have grown to some considerable dimensions, and have become possessed of hospitals containing a certain number of beds, the same enabling them to become recognized by the "licensing bodies" to be a fit place for instruction, the medical and surgical staff have then opened a school of medicine, and of course derived pecuniary benefit. Now if so in medicine and surgery, why not in pharmacy? In all the large cities and towns of Great Britain there are chemists' associations, and amongst the members of such I am sure there are many who might take the place of lecturer, only four being needed, one each for botany, chemistry, materia medica, and pharmacy. Such an appointment as lecturer (or professor) in a school of pharmacy, open only to chemists, would be an incentive for many men to study hard, even though engaged in business, and would tend greatly to exalt the profession of pharmacy; but, if we are obliged to have professors belonging to other professions, we have to thank those who are not pharmacists for teaching us our own profession of pharmacy.

In conclusion, I consider the examinations so good that they could not be better, and hope that they will continue to be held at the Society's houses in London and Edinburgh, whether they become a non-educating body or not.

W. B. O.

Manchester, March 20th, 1872.

Sir,—In answer to your invitation to discuss in your columns "Provincial Pharmaceutical Education," allow me to call attention to a fact or two. Some of the provincial associations, I know, have obtained, and do obtain, gratuitous education for their students. I came in contact the other day with an F.C.S., who said that he gave his services for nothing, delivering his lectures weekly in the laboratory connected with their local association. In Sheffield the Council of the local association obtained the gratuitous services of a gentleman to deliver lectures on pharmacy for a session; but the tax upon his time (he being engaged in business during the day) was too great, and he was obliged, reluctantly, to give it up. His lectures were well attended, and the appreciation by the students was marked by the award of a testimonial. Surely the great body of chemists do not wish that the labours of these highly-gifted gentlemen should be valued at "nil." Either the lectures, demonstrations and practical instruction must be gratuitous or remunerated; if the former, the question occurs, should it be so, whilst a Society exists, established and maintained for the express purpose of education; a Society too, which, be it remembered, is greatly supported by the provinces, and whose coffers are filled to overflowing? A school, verily, is connected with the Society, but it is almost useless; nay, I may say, practically it is so for the provinces, because the expenses, incidental and otherwise, connected with attendance in London, are such as to form a barrier to the majority of those who are apprenticed in the country. The School in Bloomsbury Square may and does, I have no doubt, answer admirably for the metropolis; but is it suitable to meet the wants of the provinces? We in the provinces answer, No! Is it advisable that our country students should be called upon to spend unnecessary time and money in London, when they ought to be able during their apprenticeships, and at as small cost as their compeers in London, to obtain such instruction as shall enable them to pass, at least, their Minor examination? We answer again, that it is unnecessary, and to put it in mild language, "it is most inadvisable." If it is inadvisable, it must be manifest to your numerous and interested readers, that they must have instructors elsewhere than at Bloomsbury Square. I do not for a moment mean to imply that it is not possible to pass the examinations without such aids, but I do assert that if necessary at Bloomsbury Square, they are necessary elsewhere; the question of all then is, how are these instructors and instruction to be provided? Already there exists more than a dozen local associations, by many of which praiseworthy efforts have been, and are being, made to assist those of their members, and non-members too, to attain the desirable instruction; but this much must be patent to your readers, that it has cost these associations, and those whose interest has been enlisted by them, great sums of money, self-sacrifice, and much self-abnegation. Ought it to be expected, and is it not highly improbable that this can continue long? Many of these associations are beginning to suffer from the burden they have undertaken. Is it not within the province, nay, is it not the duty of the parent society, to grant two or three hundred pounds annually to assist provincial education, giving the kind of aid each of these associations stands in need of?

Sheffield, March 19th, 1872. J. P.

Compulsory Pharmaceutical Education.

Sir,—That all great changes require to be gradually and carefully made is as true an axiom in pharmaceutical legislation as in any other.

We cannot do with mere class legislation, however acceptable it may be to the upper two hundred of the pharmaceutical body.

What may be all very well as regards our favoured brethren who are comfortably settled in very stylish neighbourhoods in London or the provinces, will certainly not apply to the by far larger numbers scattered throughout the length and breadth of the land.

Now, these outlying districts and smaller places must have their wants supplied; and if this is not done exactly after the West End pattern, the want is, perhaps, met in a manner far better suited to the requirements of the locality.

I am inclined to think that the following lines from one of our great poets are not inapplicable altogether to pharmaceutical ethics:—

"Order is Heaven's first law; and this confess'd,
Some are, and must be, greater than the rest,
More rich, more wise; but who infers from hence
That such are happier shocks all common sense."

Having no pet plans of my own to propose, and yet conscientiously believing that much which has been written is far-fetched and untenable, I would desire to place a few admitted principles before you, which must not be lost sight of in any regulations as to education or examination that it may be thought desirable to carry out.

It may then be at once conceded that under no circumstances whatever should a youth be taken as apprentice who has not had a pretty good plain education, with some little knowledge of Latin. In fact, he ought either to have passed his Preliminary examination (or some examination equivalent to it) before leaving school, or at any rate show his ability to do so.

But as there can be no gradations in that examination, it appears to me it would be both impolitic and unjust either to make it more stringent, or to add to the subjects for examination botany or any other study.

As to botany itself, many years' experience has not only convinced me as to the desirableness of endeavouring to promote a taste for it amongst my apprentices, but I have found some take to this who did not seem attracted by any other branch of study.

Still, however desirable a knowledge of botany may be,—and even if it be wisdom to commence its study whilst at school,—I must contend that it should not be introduced into the Preliminary.

Then, as to the Minor examination, this should include and require no higher standard of knowledge than is justly to be expected of the candidate to enable him rightly to discharge the duties of his position, having due regard to the safety and well-being of the public.

The Major examination is quite another matter, and here a very high standard of attainment should be required.

Now, it appears to me that nearly all who have written upon pharmaceutical education make the mistake at starting, of supposing that it is both possible and advisable to make the next generation of chemists and druggists thoroughly scientific individuals. I deny the possibility, and do not believe in the advisability, even if practicable.

Is the drug trade, throughout all its various ramifications and surroundings, of that superlative excellence that men of ordinary ability are to be entirely excluded from its ranks?

Is there anything so specially remunerative either in the salaries of its assistants or the earnings of the majority of the principals, as to attract from the rising generation all its talent and all its intellect? I trow not.

All honour, I say, to those youths who are determined to pursue knowledge and to reach as high a position as possible. This is what all ought to aim at, and for such there will be no real difficulties whether the facilities placed in their way be few or many.

During the time I was hospital dispenser, I had many students in my department. I have also trained many apprentices, and experience has fully convinced me that the sort of practical knowledge which a youth acquires (or may acquire if he will) during his apprenticeship, is a far greater amount than some of your correspondents seem to fancy (even under the most unfavourable circumstances).

And here, again, I may remark that the duties an apprentice may have to perform will pretty much depend upon the sort of business where he is apprenticed, and upon the amount of premium he has paid; all of which is pretty well understood beforehand; and this sort of thing cannot be revolutionized all at once. It is likely to continue for many years yet, do as you may. If cured at all, it will be by working its own cure.

Great and laudable efforts are being made throughout the length and breadth of the land to encourage and assist young men in acquiring pharmaceutical knowledge, but the general verdict is this, that so far from the classes formed becoming a difficulty, on account of the numbers entering, the difficulty has been to keep them going, on account of the few who avail themselves of the advantages they offer.

I have no plan to offer; no system to propose; my object in these remarks has entirely been to point out some necessary conclusions, which most of the writers in the Journal (starting from their own standpoint) seem to have ignored, but which, nevertheless, can never be lost sight of in that which is more or less to affect the far greater proportion of the members of a very important calling.

One who has known the Drug Trade
more than Thirty Years.

Wentworth L. Scott.—The report of the proceedings of the Midland Counties Chemists' Association was furnished to us by the Secretary of the Association, and we must refer you to him for any correction of it that may be requisite.

Q. X.—The sp. chloroformi of the B.P. will mix perfectly with the water and acid.

"*Cuprum.*"—(1.) $Cu''(NH_4)_2(SO_4)_2 \cdot 6H_2O$. (2.) No; it remains the same.

Communications, Letters, etc., have been received from Mr. G. Cocking, Mr. Slugg, Dr. Brown, Dr. Schmidt, Mr. T. W. Holdsworth, Mr. J. S. Robinson, F. E. S.

THE INTRODUCTION OF THE METRICAL SYSTEM OF WEIGHTS AND MEASURES INTO THE PHARMACOPŒIA.*

BY C. H. WOOD, F.C.S.

Since the publication of the present British Pharmacopœia, two papers have been brought before this society by Professor Redwood, pointing out the desirability of promoting and facilitating the substitution of the metrical system of weights and measures for those at present employed in English pharmacy. The arguments in favour of such a change are so numerous and powerful that it is unnecessary to urge them further. In the discussions which followed the reading of those papers, the advantages which would result from the introduction of the metrical system were generally appreciated and admitted. The practical difficulties, however, attending a transition of this kind are very considerable; and it is obvious that so important an alteration can only be brought about by very gradual means.

It is in the Pharmacopœial processes that the practical defects of the present weights and measures are most apparent, and it is through the medium of the national Pharmacopœia that the first steps towards the initiation of a more perfect system should be taken.

But in dealing with authoritative formulæ which so intimately concern the every-day detail of all pharmaceutical work, it is of great importance that nothing should be done which might occasion immediate inconvenience to those who have been long accustomed to the existing state of things, and who are unprepared for any material change. To afford facilities for the use of the metrical system in pharmacopœial processes by those who recognize its advantages, without interposing any obstacle to the employment by others of the weights and measures to which long usage has accustomed them, is the utmost which it would be wise to attempt in the first instance. It was avowedly considerations of this nature which induced Professor Redwood in his last paper to advocate the use of proportional numbers, instead of specified weights and measures, for the description of processes in the next edition of the Pharmacopœia.

To express only the proportional relation of the ingredients to each other, admits of the employment of any system of weights, or the preparation of any quantity of product, at the option of each individual, and is, therefore, in many cases the most convenient method of arranging a formula. It applies most unexceptionably in the case of those preparations, the ingredients for which are taken entirely by weight, or entirely by measure. The Pharmacopœia includes a number of such formulæ; and if the Continental system of weighing liquids as well as solids prevailed in this country, no difficulty would be experienced in at once treating the entire work upon this principle. But Professor Redwood has very clearly shown that it is also quite possible to express, in proportional numbers, formulæ involving both weighing and measuring, by simply indicating the fluids in parts by volume, or some word possessing that special meaning. This method of description might be applied with the utmost ease to the larger number of pharmacopœial preparations, and no inconvenience or misapprehension could result. Most of the simple tinctures, for example, are in the proportion of $2\frac{1}{2}$ ounces to a pint, or 1 to 8, and a formula ordering 1 part of a drug to 8 fluid parts of menstruum, could equally well be rendered into ounces and fluid ounces, or grammes and cubic centimetres. It is evident, therefore, that the use of proportional numbers in all such cases would perfectly answer the purpose of affording every facility for the metrical system without opposing any difficulty to those who prefer the existing weights and measures.

But there are a considerable number of processes in the Pharmacopeia in which the quantities of ingredients do not bear any simple numerical relation to each other; and it would be necessary to make some alteration in these before they could be expressed in whole proportional numbers. This results from the grain having no relationship to the ounce, the minim, and the fluid drachm. Thus the present process for compound infusion of gentian, if described in parts, would require the use of fractions, unless the quantities of gentian and orange-peel were somewhat reduced. In short, almost all those preparations where the grain occurs are in the same position; the ingredients cannot be represented in any simple proportions without alteration. But if these preparations are altered so as to represent the relative proportions of the constituents by whole numbers, another difficulty arises, namely, that it is no longer so easy to apply the existing weights and measures to the resulting formulæ without somewhat intricate and troublesome calculations.

Now it would be unadvisable to throw upon the pharmaceutist the labour of making such calculations, with the attendant risk of error, whenever he requires to resort to these processes. In all those cases, therefore, where the use of the grain becomes necessary, I would suggest that the quantities of ingredients, in the terms of our weight and measure, should be given in the Pharmacopœia side by side with the proportional numbers. The adoption of this course would obviate the necessity for requiring pharmaceutists to provide themselves with large measure-glasses graduated to grains instead of ounces, as proposed in Dr. Redwood's paper. It would leave those who prefer it free to make all the preparations of the pharmacopœia with the same weights and measures which they have been hitherto using, while it would not interfere with any modification of the existing proportions which may be found necessary.

Wherever such an alteration of the present quantities must be effected, it would be very desirable, as far as possible, to make the change in the direction of decimal or centesimal proportions, in order to develope to the fullest practicable extent the simplicity of the metrical system. Dr. Redwood has already proposed to convert a number of the liquors, which at present have a strength of 4 grains per fluid ounce, into one per cent. solutions. Such an alteration of strength would be so slight as to cause no practical inconvenience in the use of these preparations, while it would greatly simplify the numerical relation of the ingredients.

Of these liquors, three of them are simply aqueous solutions of salts; namely, Liquor Atropiæ Sulphatis, Liquid Sodæ Arseniatis, and Liquor Potassæ Permanganatis. The two first would be written,

* Read at the Evening Meeting of the Pharmaceutical Society of Great Britain, April 3, 1872.

according to the method I have suggested, as follows:—

Salt, $8\frac{3}{4}$ grains	or	1 part.
Water, 2 ounces		100 fluid parts.

The third would be $87\frac{1}{2}$ grains to a pint, or 1 to 100. Liquor Arsenici Hydrochloricus, Liquor Morphiæ Acetatis, Liquor Morphiæ Hydrochloratis, and Liquor Strychniæ contain a certain amount of acid, and three of these are partly spirituous. Liquor Morphiæ Acetatis may be taken as an example:—

Acetate morphia, $8\frac{3}{4}$ grs.		1 part.
Dil. acetic acid, 19 mins.		2 fl. parts.
Rectified spirit, $\frac{1}{2}$ fl. oz.	or	25 fl. parts.
Water, a sufficiency to make 2 fl. oz.		A sufficiency to make 100 fl. pts.

Liquor Arsenicalis would be written:—

Arsenious acid, $87\frac{1}{2}$ grs.		5 parts.
Carb. of potash, $87\frac{1}{2}$ grs.		5 parts.
Comp. tinct. of lavender, 5fl. drs. $6\frac{1}{2}$ mins.	or	16 fluid parts.
Water, a sufficiency to make 1 pint.		A sufficiency to make 500 fl. pts.

Liquor Hydrargyri Perchloridi and Liquor Lithiæ Effervescens, also Peppermint and Spearmint waters, might, in the same way, be made to contain 1 part in 1000 fluid parts. The ointments of the three alkaloids, aconitia, atropia, and veratria, which at present are in the proportion of 8 grains to the ounce, might be made 1 part to 50, or $8\frac{3}{4}$ grains to the ounce.

In like manner most of the wines might be made to have decimal or centesimal proportions without departing, to any material degree, from the present strengths. Thus, Vinum Ferri Citratis would be 2 parts in 100 fluid parts, or 175 grains to the pint; Vinum Antimoniale 1 part in 200, or $43\frac{3}{4}$ grains to the pint; Vinum Opii would be written:—

Extract of opium, 1 oz.		5 parts.
Cinnamon,	or	
Cloves, of each, $87\frac{1}{2}$ grs.		1 part.
Sherry, 1 pint		100 fl. parts.

Compound Decoction of Aloes would become centesimal by very slightly augmenting the proportion of extract:—

Extract of aloes, 175 grs.		2 parts.
Myrrh and Saffron, each $131\frac{1}{4}$ grs.		$1\frac{1}{2}$ part.
Carb. potash, $87\frac{1}{2}$ grs.		1 part.
Ext. liquor., 1 oz. 175 grs.	or	7 parts.
Comp. tinct. of cardamoms, 10 oz.		50 fluid parts.
Water, a sufficiency to make 40 fl. oz.		A sufficiency to make 200 fl. pts.

Among the infusions, tinctures and ointments, however, there are a number of cases where the grain occurs in conjunction with the ounce, in which it would be unsafe at present to do more than obtain a simple relation of parts.

An examination of these processes as they at present stand will show that, in the majority of instances, the number of grains mentioned is 60 or 30. In order to convert these into proportional formulæ, it is necessary either to augment the 60 grains to $62\frac{1}{2}$, which is the seventh part of an ounce, or reduce them to $54\frac{2}{3}$ grains, which is the eighth part of an ounce. In like manner, where 30 grains are now indicated, the number must be increased to $31\frac{1}{4}$ grains, the fourteenth, or diminished, to $27\frac{1}{3}$ grains, the sixteenth part of an ounce. When the fluid drachm occurs in the same formula, it is generally necessary to employ the eighth and the sixteenth; but in other cases it is more convenient to take the seventh and the fourteenth parts. The latter method adapts itself to the compound infusions of orange-peel and of gentian, the infusions of catechu, linseed, quassia, and senna, to the compound iron mixture, and 12 of the ointments, as the following examples will illustrate:—

Infusion of Quassia.

Quassia chips, $62\frac{1}{2}$ grs.	or	1 part.
Water, 10 oz.		70 parts.

Compound Infusion of Orange.

Orange-peel, $\frac{1}{4}$ oz.		7 parts.
Lemon-peel, $62\frac{1}{2}$ grs.	or	4 parts.
Cloves, $31\frac{1}{4}$ grs.		2 parts.
Water, 10 oz.		280 parts.

Infusion of Catechu.

Catechu, $156\frac{1}{4}$ grs.		10 parts.
Cinnamon, $31\frac{1}{4}$ grs.	or	2 parts.
Water, 10 oz.		280 parts.

Compound Iron Mixture.

Sulphate of iron, 26 grs.		$2\frac{1}{2}$ parts.
Carbonate potash, $31\frac{1}{4}$ grs.		3 parts.
Myrrh Sugar, of each, $62\frac{1}{2}$ grs.	or	6 parts.
Spirit of nutmeg, 4 fl. drs.		21 fl. parts.
Rose water, a sufficiency to make 10 fl. oz.		A sufficiency to make 420 fl. pts.

Among the ointments, there are at present four which are 62 grains, one which is 64 grains, one which is 62 grains, and two which are 60 grains to the ounce. These might be all made $62\frac{1}{2}$ grains to the ounce, or 1 part to 7 parts. In like manner, there are two which are 32 grains and two which are 30 grains to the ounce; these would become $31\frac{1}{2}$ grains to the ounce, or 1 to 14. There are also four ointments of 80 grains to the ounce; these might be made $87\frac{1}{2}$ grains to the ounce, or 1 part to 5 parts.

The formulæ in which the 60 grains will be best reduced to the eighth part of an ounce include Linimentum Sinapis Co., Mist. Gentianæ, Tr. Benzoini Co., Tr. Camphoræ Co., Tr. Cardamomi Co., Tr. Cinchonæ Co., Tr. Lavandulæ Co., and Vapor Coniæ. The following will serve to indicate the manner in which I would propose to represent these:—

Tinctura Cinchonæ Co.

Pale bark, 2 oz.		32 parts.
Orange-peel, 1 oz.		16 parts.
Serpentary, $\frac{1}{4}$ oz.	or	8 parts.
Saffron, $54\frac{3}{4}$ grs.		4 parts.
Cochineal, $27\frac{1}{3}$ grs.		2 parts.
Proof spirit, 1 pint		320 fl. parts.

Tinctura Camphoræ Co.

Opium, 41 grs.		$1\frac{1}{2}$ part.
Benzoic acid, 41 grs.		$1\frac{1}{2}$ part.
Camphor, $27\frac{1}{3}$ grs.	or	1 part.
Oil of anise, $\frac{1}{2}$ fl. dr.		1 fluid part.
Proof spirit, 1 pint.		320 fluid parts.

Lin. Sinapis Co.

Oil of mustard, $1\frac{1}{2}$ fl. drs.	or	$1\frac{1}{2}$ fl. parts.
Ether. ext. mezereon, $54\frac{2}{3}$ grs.		1 part.
Camphor, 164 grs.		3 parts.
Castor oil, $7\frac{1}{2}$ fl. drs.		$7\frac{1}{2}$ fl. parts.
Rectified spirit, 6 fl. oz.		48 fluid parts.

Dr. Redwood has recommended in the case of Confection of Opium that the syrup should be taken by weight instead of measure. It might, however, as it appears to me, be equally well represented as follows:—

Comp. powd. of opium 194 grs.	or	4 parts.
Syrup, 1 fl. oz.		9 fl. parts.

These quantities are exactly in the proportion of 1 part to 3 parts by weight.

The course adopted by Professor Redwood in the treatment of the enemas is, I venture to think, open to some objection, inasmuch as it makes the metrical system appear unnecessarily complicated.

If the formula for an enema is to be regarded as a prescription for one dose of medicine, it should be made to illustrate the method of prescribing in the new system as compared with the old, and should be equally simple in both cases.

I would write the Enema of Aloes as follows:—

Aloes, 45 grs.	or	3 grammes.
Carbonate of potash, 15 grs.		1 gramme.
Mucilage of starch, $10\frac{1}{4}$ fl. oz.		300 fl. grms.

In this case 3 grammes is not given as the *exact equivalent* for 45 grains, but it represents the *corresponding dose.* The strength of the liquid produced by either formula is identical, but the quantity of product is only approximate.

The approximation, however, is sufficiently near for all purposes of prescribing. 300 fluid grammes are equal to 10·58 fluid ounces, or $\frac{1}{3}$ of an ounce more than $10\frac{1}{4}$.

Enema of Assafœtida, on this plan, would be written.

Assafœtida, 31 grains	or	2 grammes.
Water, $4\frac{1}{4}$ oz.		120 fluid grammes.

120 fluid grammes are equal to 4·233 fluid ounces, or 0·017 less than $4\frac{1}{4}$.

It will, I think, be seen that if the proportional numbers only were given in the Pharmacopœia for all the processes to which I have now referred, it would not be easy to render them into the English weights and measures; at any rate, if small quantities of the products were required. The relationship is not easy to perceive, and until a little practice had been attained, somewhat irksome calculation would, as it appears to me, be necessary. The exclusive use of grain weights, and large glasses graduated to grain-measures, in all such cases would certainly remove this difficulty; but it must be remembered that comparatively few pharmacies possess such sets of weights or measure-glasses. Moreover, many practical pharmaceutists are but little accustomed to the employment of the grain-measure. If new weights and measures must be provided, it would be just as easy to obtain those of the metrical system at once; and it would probably require no greater effort to attain familiarity with grammes and cubic centimetres, than to become habituated to grain-measures.

Whether this be so or not, placing the quantities in the ordinary terms of our weights and measures, side by side with the proportional numbers in all cases where the relationship is obscure, would, as I consider, remove any risk of inconvenience or error. It is true that to do this requires in many instances the use of fractions of grains; but it is only the $\frac{1}{2}$, the $\frac{1}{4}$, and the $\frac{1}{3}$ of a grain which are necessary. These, however, could be readily cut from a grain weight, or could be purchased for a mere trifle. There can be no more difficulty in weighing an odd number of grains and a fraction, than in weighing an even number. Moreover, where these fractions occur it is generally in expressing the eighth, the sixteenth, the seventh, or the fourteenth part of an ounce; and as our sets of weights are always provided with the $\frac{1}{2}$ and the $\frac{1}{4}$ of an ounce, there would be no difficulty in adding the $\frac{1}{8}$ and the $\frac{1}{16}$. These would stand for the exact amount which in the formula is expressed in grains. Indeed, if the appearance of such an awkward fraction as a third be objectionable in the Pharmacopœia, I would suggest, as an alternative, writing $\frac{1}{8}$th or $\frac{1}{16}$th of an ounce, in place of the grains, which are equivalent to that quantity. No one, I apprehend, would object to add these weights to their sets.

Bearing in mind that the avowed object of employing proportional numbers in the pharmacopœia is to foster the introduction of the metrical system into English pharmacy, I think better service would be done to that cause by avoiding their use in the description of processes for volumetric testing. In such cases I would at once use grammes and cubic centimetres.

By the employment of the metrical system for the analytical methods, it would obtain a more prominent place in the pharmacopœia, which would be very serviceable to its future progress.

Those who dislike its use could equally well employ grains and grain-measures, for the numbers would in every case remain the same. This alternative might be indicated in the appendix in the same manner that is now done for the metrical system. No inconvenience, therefore, could result from the exercise of this amount of official preference.

I apprehend also that it would be of very little use to make such important modifications in the pharmacopœia as are now contemplated, for the sake of obtaining an improved system of weights and measures, unless the doses of the drugs and preparations are expressed in terms of the new system side by side with those of the old. The metrical system can obtain but very partial use in English pharmacy until it is introduced into the prescribing and dispensing, as well as the preparation of medicines.

It is by learning the doses in metrical weights and measures, that the best knowledge of the system can be obtained, because the concrete value of the terms is thereby acquired. It will doubtless take many years before grammes replace grains in our prescriptions, but this should not deter us from working assiduously towards the accomplishment of that object, with the confidence that time will inevitably prove the superior merits of the metrical system.

[*The discussion upon this paper is printed at p.* 813.]

THE OCCURRENCE OF COPPER IN CAJUPUT OIL.*

BY EDWARD HISTED,

Pharmaceutical Chemist, Brighton.

It was observed many years ago by Guibourt that cajuput oil frequently contains copper; but the fact has been much doubted, for neither Brande nor Pereira, both of whom directed attention to the subject, was ever able to detect a trace of that metal in any sample of the oil submitted to examination.

Some months ago my friend Mr. Hanbury informed me that the occurrence of copper in cajuput oil, at least occasionally, was indubitable, and invited me to re-examine the question, by testing several samples which he had collected, and which he placed at my disposal. I willingly accepted the task, the results of which I beg leave now to lay before the Pharmaceutical Society.

The method of testing for copper which I adopted was the following:—

A fluid dram of the oil is evaporated to dryness in a Berlin-ware capsule, and the resinous-looking film which remains coating the sides of the porcelain is then charred by heating the latter to dull redness over a Bunsen's burner. A drop of nitric acid added before the capsule is quite cold, readily dissolves any copper present, and affords a solution to which, when slightly diluted, the usual tests for that metal can be applied; of course, on a very small scale.

The samples sent to me by Mr. Hanbury, or obtained from other sources, were the following:—

No. 1. Cajuput oil, imported about 1830, colour very pale green, and the usual characteristic odour:—

No. 2. Cajuput oil, given by Admiral Laplace on his return from circumnavigating the globe in the 'Artémise,' 1839. From the collection of De Lens:—colour, fine deep green, odour very agreeable.

No. 3. Cajuput oil, London market, 1870.

No. 4. Cajuput oil, London market, 1871.

No. 5. Cajuput oil, a shade darker than the two former, and with an odour in which citronelle oil was, as I thought, recognizable.

No. 6. Cajuput oil, resembling samples Nos. 3 and 4, from my own stock.

Treated in the manner I have described, each of these samples gave indications of copper, the presence of which I proved by ammonia, ferrocyanide of potassium, solution of arsenic and reduction by metallic iron (deposited on a needle).

In some samples the copper may be separated by agitating the oil with solution of ammonia, the oil in such case losing its colour and the water becoming blue.

That copper is not of necessity present, because the oil has a green hue, was well proved by Guibourt, who distilled the leaves of several species of *Melaleuca*, *Metrosideros* and *Eucalyptus*, cultivated at the Jardin des Plantes in Paris, and obtained from them volatile oils of a fine green colour.

I have also tested the essential oils of bergamot, wormwood and cubebs, but without finding any trace of copper.

If ordinary cajuput oil is redistilled, I find the product to be *perfectly colourless*, a result analogous, as Mr. Hanbury has reminded me, to that obtained with oil of thyme, which, as drawn from the plant, is of a deep brown, but becomes colourless by redistillation. But cajuput oil acts readily on metallic copper, and my colourless oil, after a few days' contact with copper filings, became quite green, and afforded the same reactions as the crude oil of commerce.

With regard to the amount of cupreous contamination, the French writer already quoted states that he found cajuput oil of very green colour to contain of copper 0·137 grams in each 500 grams; but that usually it is in still lower proportion; too small, in fact, to render the oil unfit for medicinal use.

* Read at the Evening Meeting of the Pharmaceutical Society of Great Britain, April 3, 1872.

THE PHARMACY OF THE BIBLE.*

BY J. T. SLUGG, F.R.A.S.

I use the word pharmacy in its literal and broadest, not in its conventional and narrow sense. It cannot be otherwise than interesting to gather together, and pass in review, the teachings of the Bible, whose history goes back four thousand years into the past ages, as to matters connected with our own daily calling. After a careful investigation of the subject, I am bound to acknowledge at the outset, that whilst on the one hand there are references to many of the diseases which have afflicted mankind in ancient times, there is very little to be learnt in the Bible as to the nature of the remedies employed, or the healing art in general. We read of physicians and of apothecaries, and of the "many medicines of the Egyptians;" and Solomon who wrote, we are told, on natural history, seems to have included in his favourite study some knowledge of the medicinal use of various plants, etc., but the results of his study are lost to the world. The drug known as "balm of Gilead" was supposed to have a medicinal virtue. We meet with what is a very popular remedy in the present day, prescribed by the prophet for a boil of a very serious nature, from which King Hezekiah was suffering, viz. a plaster of *figs*, which was successful in its results. We learn something of what we may call a domestic remedy for a wound, in the time of the Saviour, in the parable of the good Samaritan, who, finding the wounded man, bound up his wounds, pouring in *oil* and *wine*. Though *poisons* are frequently mentioned in the Bible, there is no *direct* reference to vegetable or mineral poisons as a means of destroying life; those mentioned being the poisons of animals, as of serpents, asps and dragons. In the list of the evil practices of the day given by St. Paul in his Epistle to the Galatians, occurs the word "witchcraft." The Greek word for this is "*pharmakeia*," from which our word pharmacy is derived. It has been suggested that *poisoning* is meant. No doubt it does either mean that, or what is more probable, the preparation of magical potions, and what were then believed in, and greatly used, *philtres*. We read of *eye-salve* in Revelation, but have no means of ascertaining of what the eye-salve then in use was composed. It is worthy of note, that there is an occasional trace of chemical knowledge in the earliest times; for instance, the calcination of gold by Moses; the action of vinegar on natron, and of the cleansing properties of *soap*. We find also a direct reference to the business of a druggist, though not by name, in the Song of Solomon, where, in connection with perfumes, we read of "the powders of the merchant." In Exodus (c. xxx. v. 23) we have a regular Hebrew prescription,

* Read at a meeting of the Manchester Chemists and Druggists' Association, March 8, 1872.

commencing with the orthodox, "Take of so and so, so much."

In the Bible we have either direct or probable reference to forty-five drugs, viz.:—

Aloes.	Lime.
Aniseed.	Mallows.
Almonds.	Manna.
Antimon. sulph.	Millett.
Balm of Gilead.	Mint.
Brimstone.	Mustard seed.
Bdellium.	Myrrh.
Calamus.	Natron.
Camphire.	Olive oil.
Cassia.	Onycha.
Cummin.	Palm.
Coriander.	Pomegranate.
Colocynth.	Ricinus.
Cinnamon.	Saffron.
Frankincense.	Sponge.
Fig.	Stacte.
Garlick.	Spikenard.
Gall.	Soap.
Galbanum.	Vermilion.
Honey.	Vinegar.
Hyssop.	Wax.
Hemlock.	Wormwood.
Lign Aloe.	

Besides these, we read of anointing oil, ointment, perfumery, plaister, mortars and pestles, scales and weights.

Mortars and pestles we meet with as early as the time of Moses, for we learn that the Israelites in the wilderness used them for the purpose of grinding or beating the manna which they gathered. In Proverbs we find it suggested "Though thou bray the fool in the mortar with a pestle, yet will not his folly depart from him." Egyptian sculptures exist exhibiting the figures of men pounding in mortars with large pestles. On the wall is a sketch of one such Egyptian piece of sculpture. On the left you see two men standing opposite each other at one mortar, each with a large pestle, pounding alternately, as we often see blacksmiths striking their iron. On the right of the sketch is represented one man sifting the contents of the mortar, whilst the other is bringing a fresh supply. Next to this sketch you see one of another piece of sculpture, exhibiting the ancient form of scales used by that people. As scales of this form appear in the paintings and sculptures of the Egyptians as ancient as the time of Moses, we may conclude that the scales used by the Jews were of similar construction, and it is interesting to notice that they so greatly resemble the handscales in use among ourselves.

Ointments are frequently mentioned in the Bible, showing their use in very early times. There is a reference in the Book of Job, which is perhaps the most ancient book in the world, to the process of making ointment; where we read, "He maketh the sea to boil like a pot; he maketh the sea like a pot of ointment." There is also a remarkable reference to ointment in Ecclesiastes, indicating that the apothecary of that day was as troubled with flies in his business as the druggist of today, for they got into his ointments and spoiled them. "Dead flies cause the ointment of the apothecary to send forth a stinking savour." The ointments in use amongst the Jews were to a great extent vehicles for perfume; hence the words in the Song of Solomon, "Because of the savour of thy good ointment, thy name is as good ointment poured forth." Amongst the Jews the use of ointments was fourfold, viz. for cosmetic, funereal, medicinal and ritual or religious purposes. The practice of anointing the head and clothes on festive occasions prevailed among the Jews. There are several references to it in Scripture. Ointments were also used to anoint dead bodies, and the clothes in which they were wrapt. This explains our Saviour's saying, "Against the day of my burying hath she done this." In Exodus, Moses is commanded to make a holy ointment, to be used only for sacred purposes, compounded of myrrh, sweet cinnamon, sweet calamus, cassia and olive oil. Of the dry ingredients, 60 lb. were to be used to 12½ lb. of olive oil. It is difficult to understand how so little oil could form the other ingredients into an ointment. Maimonides says that the powdered ingredients were infused in water till all the virtue was extracted, and then the infusion poured into the oil and boiled till the water was evaporated. The ointment was to be "compounded after the art of the apothecary." In the margin we have the word "perfumer" for "apothecary," which is a better rendering of the word. The business of a perfumer was not distinguished from that of an apothecary in the time of the translators. Hence Shakspeare, who lived long before, says, "An ounce of civet, good apothecary, to sweeten my imagination." Whether the Jews in Bible times understood the nature and use of drugs as medicinal agents or not, they certainly understood the art of perfumery. We have ample evidence of their profuse employment of perfumes. They used them to their persons, their clothes and their beds. Even as early as the time of the patriarch Isaac, before the Israelites went into Egypt, we have an instance of perfumery applied to the clothes. We are told that the old man said to Jacob, "Come near now and kiss me, my son:" and he smelled the smell of his raiment, and said, "See, the smell of my son is as the smell of a field which the Lord hath blessed." The principal fragrant substances employed in perfumery by the Jews were cassia, cinnamon, calamus, camphire, frankincense, lign aloe, myrrh, saffron, spikenard. These articles were used either dry, or their perfume extracted and embodied in the form of an ointment.

(*To be continued.*)

A NEW SOLVENT OF IODIDE OF LEAD AND ITS APPLICATION TO PHARMACY.

BY DONATO TOMMASI, DOCTEUR ES SCIENCES.*

Some time since, while studying the action upon iodide of lead of nascent carbonic acid, resulting from the reaction of a solution of acetate of lead, acidulated by a few drops of acetic acid, upon a solution of iodide of potassium to which some carbonate of sodium had been added, the author was surprised to find that whilst the carbonic acid was freely given off, the yellow precipitate of iodide of lead disappeared as quickly as it was produced. This was found to be due not to the formation of a new compound, but to the fact that the plumbic iodide was held in solution. The solution of acetate of sodium in which it was contained being set aside, after a time beautiful golden yellow crystalline plates of iodide of lead were deposited.

As iodide of lead is insoluble in alcohol, ether, chloroform, acetic acid and glycerine, while it is only soluble in the proportion of 1 part to 1235 of cold and 1 part to 194 of boiling water, the author considered the subject worthy of further investigation. He found that iodide of lead was soluble in a concentrated solution of acetate of sodium in the following proportions:—

50 c.c. of a cold concentrated solution of acetate of sodium will dissolve 1 gram of the iodide; the same quantity, boiling, will dissolve 2 grams.

50 c.c. of the cold concentrated solution, with one-fifth c.c. of acetic acid added, and then heated to the boiling point, will dissolve 6 grams of the iodide. 20 c.c. of a boiling supersaturated solution, acidulated by a few drops of acetic acid, will dissolve 8 grams of the iodide, which is equal to 40 per cent. If too much acetic acid be added, the solubility of the iodide of lead will not be augmented.

* Abstracted from a Memoir presented to the Société Royale de Pharmacie at Brussels.

Crystallized Iodide of Lead.—The author proposes to take advantage of this fact for the preparation of crystallized iodide of lead. This compound is usually obtained by dissolving the iodide in an excess of water and evaporating; but the operation is a tedious one, at least ten litres of water being required to obtain thirty grams of crystals. The method he suggests is to boil together—

Distilled Water	100 grams.
Acetate of Sodium	160 ,,
Acetic Acid	A few drops.

To this solution a paste consisting of eight grams of iodide of lead mixed with a little water, is to be added in small quantities at a time, stirring continually. When all the iodide is dissolved, the solution is left to cool. After twelve hours a small quantity of cold water is added, and then larger quantities, until the whole of the acetate is separated from the iodide. The crystals of the iodide are then collected on a filter, washed, dried and preserved in bottles.

Detection of Impurities.—The author also points out that this property allows of the recognition and quantitative estimation of the chromate of lead frequently present as an impurity in the iodide. For this purpose 0·5 grams of the suspected iodide may be heated for a quarter of an hour in a saturated solution of sodic acetate, acidulated by a few drops of acetic acid. At the end of that time, the whole of the iodide will be dissolved and the chromate of lead, if present, will be deposited on cooling. This may be separated by a tarred filter, washed, dried and then weighed. M. Tommasi states that he has thus been enabled to detect with great facility ·002 gram of the chromate, which he had previously mixed with 0·5 gram of the iodide.

Glycerole of Iodide of Lead.—Glycerine, which only dissolves traces of iodide of lead, will dissolve a considerable quantity when mixed with acetate of sodium. The author therefore suggests that a glycerole might be prepared containing the iodide in solution, not in suspension, that would be more active than the ointment, and he expresses an opinion that the acetate of sodium present would not interfere with its use for the purposes to which the ointment is usually applied. It may be made from—

Saturated solution of acetate of sodium	15 c. c.
Glycerine	25 c. c.
Iodide of lead	0·4 gram.
Rose water	A few drps.

These ingredients should be rubbed in a porcelain mortar until the iodide of lead has entirely disappeared. Should the glycerole be too thick, it may be diluted with a little water.

It should be borne in mind that though iodide of lead dissolves freely in hydriodic acid, the alkaline iodides and chloride of ammonium, in those cases well-defined double combinations are formed; for instance—

$$Pb''I_2 + IH = Pb''\left\{\begin{matrix}I\\I\end{matrix}\right.IH$$

TINCTURE OF PERCHLORIDE OF IRON.

BY JOHN H. WILSON.

The above tincture, prepared according to the directions in the present Pharmacopœia, cannot be kept for even a short space of time without the formation of a considerable precipitate of oxychloride of iron, which, besides the loss of strength that it causes, presents a most unsightly appearance in the bottles in which the tincture is preserved. Many chemists therefore retain the use of the old London Pharmacopœia formula, which, if not equal in other respects, has a transparent appearance with slight, if any, sediment.

Professor Attfield, in his 'Chemistry,' remarks that "the spirit" in the B. P. tincture "is unnecessary, useless and deleterious, for it acts neither as a special solvent nor as a preservative, the offices usually performed by alcohol; but, unless the liquid contain excess of acid, decomposes the ferric chloride, and causes the formation of an insoluble oxychloride of iron," closing his remarks by saying that "the liquor, which is similar in strength, is doubtless destined to displace the tincture altogether."

Seeing that physicians and medical men generally, still continue to prescribe the *tincture* of iron, and are likely to do so, regardless of its instability, it would be more satisfactory to have a formula from which a tincture can be produced, which will remain clear and free from deposit for a considerable length of time. I would therefore suggest an addition to the B. P. formula of 10 per cent. of pure glycerine, which I find to answer all the purposes of preservation.

The following would then be the recipe:—

℞ Liq. Ferri Perch. Ft. ʒv.
Sp. Vini Rectif. ℥xiij.
Glycerin. Pur. ℥ij.

Mix the glycerine with the spirit, then add the liquor, shake and preserve in a stoppered bottle.

Thus made, with Price's glycerine, the sp. gr. is 1·026.

I have kept a sample thus prepared for upwards of a month, and find but a most minute precipitate in the vessel, whilst from B. P. tincture kept under similar circumstances a large amount has been thrown down. The amount of glycerine is not sufficient to make any material difference in the taste, and under the circumstances it may be considered a justifiable addition.

THE PUBLIC HEALTH BILL.

In the course of a speech delivered at Halifax, on Wednesday last, Mr. Stansfeld referred to the Public Health Bill. He said that it had been prepared with considerable care, but with this consciousness, that no measure upon such a subject could pass through Parliament without being made better for the criticisms which its publication would bring upon it in Parliament, and from the public at large. He had said in the House of Commons that he had no jealousy of amendments; that he had even requested suggestions; and that every suggestion should have the most careful consideration which he could give it. Let him say a word upon one clause, —the river pollution clause—with regard to which a deputation from Leeds had waited upon him that day. For several years a Royal Commission had been sitting upon the question of the pollution of rivers, and that Commission had presented reports, in which it was suggested that the waters in rivers issuing from manufactories should be subjected to certain chemical tests, and should not be allowed to be discharged into the stream without being subjected to such chemical standard. He did not profess to be a chemist; and in considering this question, with very great care and thought, he found it impossible to see his way to satisfactorily constructing a clause that would be able to meet the ever varying conditions of the manufactures in various parts of the country. He, therefore, gave up the attempt to construct a clause of which he could say to himself, is it one by which I can abide? and he said to himself it was only fair and courteous to the Royal Commission that he should present to Parliament its proposals; and in the clause to which he referred, subject to certain limitations, he had produced the conclusions and proposals of the River Pollution Commissioners. But he invited suggestions on that and on other clauses. He had had deputations and suggestions; and he was now in a position to say, though not pretending to be a chemist himself, that he knew enough to be satisfied that that clause would require amendment; and, therefore, he should be justified in asking the House of Commons to allow him to amend it.

The Pharmaceutical Journal.

SATURDAY, APRIL 6, 1872.

Communications for this Journal, and books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

EARLY CLOSING IN THE METROPOLIS.

In their praiseworthy efforts to shorten the hours of business, and thus allow Assistants and Apprentices greater opportunities for study and recreation, the Provinces are known to be far in advance of London. We understand, however, that a movement is on foot among metropolitan pharmacists for carrying out this desirable object, and that already nearly twenty well-known houses have begun to put up their shutters an hour earlier than formerly. We would fain see the chemists of the whole postal district following the example, and would also venture to suggest a more rigid observance of the bank holidays. Though we were gratified to see many pharmacies *entirely* closed on Easter Monday, the attempt at a suspension of business was by no means universal, and we anticipate a more successful result on future occasions. In the interests of the public as well as the trade, we regard this movement as a step in the right direction, and one which reflects great credit on all concerned.

In referring to this subject, we are glad to state that the movement for shortening the hours of business among the pharmaceutists at the East-end of London, which we mentioned some time since* as having been initiated at Bow, appears to be progressing. We have received a copy of an announcement issued by Mr. Fox, Pharmaceutical Chemist, Bethnal Green Road, to the effect that his establishment will be closed at eleven o'clock on Saturdays, and nine on other evenings of the week. On Sunday business is to be confined between nine and eleven in the morning, but proper arrangements are to be made for the supply of medicines urgently required during the day.

PHARMACY IN THE VESTRY.

The attention of pharmacists is ever and anon imperatively drawn to the responsibility they incur in pursuing their calling. The ignorance, actual carelessness, or "want of thought" of a dispenser of medicines may place him in a felon's dock; and, if he be a servant, the reflex action of the English law may prove the employer's ruin also. But errors are not always confined to the ignorant or careless; the most experienced dispenser will occasionally check himself in the act of committing an egregious blunder. It may be he has got the wrong bottle or the wrong weight, and the mistake is only made evident by the physical characters, or the large bulk of the substance; still, *humanum est errare*, and if the mistake be *not* made evident, a fatality perhaps occurs. The hurry of business is sometimes pleaded as the excuse, or the attention being distracted by a loquacious patient, or, it may be, the overwork to which the poor remuneration proverbial to the pharmacist's calling compels him to submit. For the public seem ever to expect pharmacists to be their patient drudges; just as when ROMEO wanted the poison on the holiday, and although "the beggar's shop" was shut, the apothecary was inside.

What may be required from a pharmacist, as well as the truth with which this plea of overwork might sometimes be urged, has been pointedly brought under our notice by an advertisement which appeared in the *Lancet* a few weeks back. The guardians of the Holborn Union advertised for a dispenser, and intending candidates were supplied, on application, with particulars as to the duties, etc., pertaining to the office. We are enabled to furnish our readers with the following summary:—

"To attend daily from 9 o'clock A.M. to 11 o'clock "A.M., at the Farringdon Road workhouse, to dis- "pense all medicines required by the medical officer; "to attend daily from 1 o'clock P.M. to 4 o'clock P.M., "at the City Road workhouse, for the like purpose; "to attend daily from 5 o'clock P.M. to 9 o'clock P.M., "at the Gray's Inn Road workhouse, for the like "purpose. On Sundays to attend at the different "workhouses to dispense medicine as per arrange- "ment with the medical officers."

The daily service required (omitting Sundays) is nine hours, besides the time occupied in running from pillar to post, which perhaps would take two hours more. These duties are supposed to be sufficiently remunerated at 35*s*. per week. We might have doubted from what class the official was to be selected were we not told that applicants are to be either registered under the Pharmacy Act, 1868, or licentiates of the Apothecaries' Company. Probably the successful candidate will have to dispense for two hundred patients daily; but then they are only paupers. It is true that inquests are held upon workhouse inmates at times; nevertheless, the vestrymen having secured a qualified dispenser, will feel comfortable, although their *employé* works many more hours a week than an ordinary carpenter that receives a greater remuneration.

The recent proposition by Mr. STANSFELD to grant similar powers with regard to the establishment of workhouse dispensaries throughout the country, to those possessed by the metropolitan authorities, might

* See *ante*, p. 370.

have caused a slight flutter of expectation to some who thought they saw in it some prospects of good both for dispensers and patients. But if the boon is to come in so questionable a shape as that adopted by the Holborn Union, perhaps it would not do much more injury to the country districts to leave them as they are.

THE RECOVERY OF SMALL DEBTS.

A Bill having for its professed object the limitation of credit for goods sold, has been introduced into the House of Commons by Mr. Bass and Mr. Fowler, which, in consequence of a special exemption from its operation contained in it, is of some interest to the pharmaceutical body. The Bill proposes to discourage the giving of credit in small sums, and thus decrease the number of petty suits in the County Courts, by enacting that "no action, "plaint, or suit shall henceforth be maintainable in "any court to recover any debt or sum of money "under forty shillings, alleged to be due in respect "of any goods sold after the passing of this Act "(*other than medicines or medical or surgical "appliances*), unless such small debt or sum of "money shall be the balance still owing on any "account which exceeded forty shillings (or shall "have been *bonâ fide* contracted at one time to the "amount of twenty shillings or upwards)."

Although the principle of the Bill—to discourage credit by making the recovery of the debt doubtful—is not a new one, and these columns are not suitable to the discussion of the general subject, we may venture to remark that as the Bill stands, considerable hardship and difficulty would frequently arise in discriminating between "goods sold" and other service rendered. The saving clause, too, which might be looked upon by the pharmacentist as securing his interest, would, perhaps, prove a broken reed to lean upon, as it would be rather too much to say, in the present order of things in this country, that "medicines or medical or surgical appliances" would cover all the items that might figure in his bill.

The Bill, which does not extend to Scotland or Ireland, is set down for second reading on Wednesday, May 8th; we do not, however, anticipate its passing in anything like its present crude form.

Last week, in announcing the Evening Meeting of Wednesday, and guided by an official list of meetings from July, 1871, to June 1872, we inadvertently stated that it was the last during the present session, as has hitherto been the case. This, however, turns out to be incorrect, inasmuch as it has this year been decided that two further Evening Meetings shall be held in the months of May and June.

On Wednesday last Messrs, Dows, Clark and Co. placed one of their newly-devised Cabinet Soda-water and Syrup Machines in the Museum, for the inspection of gentlemen attending the Evening Meeting. They also exhibited specimens of a new clasp for securing the corks of soda-water bottles, in the place of the ordinary wire. This ingenious arrangement may be appplied or removed instantaneously, and with very little effort or trouble. We purpose soon referring again to this subject.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

April 3rd, 1872.

MR. A. F. HASELDEN, F.L.S., PRESIDENT, IN THE CHAIR.

Present—Messrs. Atherton, Betty, Bottle, Brown, Carr, Frazer, Greenish, Groves, Hills, Sandford, Savage, Shaw, Smith, Sutton, and Williams.

The minutes of the last meeting were read and confirmed.

PRELIMINARY EXAMINATION.

The Secretary reported that the time fixed by the Council at their last meeting for superintending the Preliminary examination in the provinces was found to be generally inconvenient to the Local Secretaries, and that the majority of them had since expressed their opinion that the hours from 10 to 1 o'clock would be the most suitable time.

The following is a summary of the opinions of the Local Secretaries as to the time most convenient to them to superintend the Examination:—

Commencing at	No.	Commencing at	No.
8	2	2	49
8·30	1	3	8
9	19	4	4
9·30	3	5	2
10	75	6	8
11	13	7	1
12	18	8	8
1	10	9·30	3
Any time the Council may appoint			16.
Total			240.

Mr. Sandford thought it was not sufficiently known throughout the country why the alteration was made. It had been stated at the Council table that the questions were telegraphed from one place where the examination had been held to another where it had not commenced, and it was very important that there should be no possibility of such a thing taking place. He was informed that one of the Local Secretaries stated that he never held his examination on the day appointed by the Council, and, therefore, he (Mr. Sandford) thought the request should be made imperative — that the examination should be held on the day and at the hour prescribed.

Mr. Shaw asked if any positive complaints had been made of Twelve o'clock as the hour.

The President said that very strong objections had been made by many persons.

Mr. Brown said he was quite satisfied by his own inquiries that the telegraphing referred to did really take place.

The President said another Local Secretary had written to say that he had known of such an occurrence taking place.

It was then—

Resolved—That the resolution of the Council on the 6th March, appointing Twelve o'clock as the time for holding the Preliminary Examination, be rescinded.

It was further—

Resolved—That the Preliminary Examination be held in London and the Provinces on the same day and hour simultaneously, and that *Ten o'clock* (A.M.) be the time fixed.

The Secretary was requested to issue notice to the Local Secretaries accordingly.

NOMINATIONS FOR COUNCIL.

The Secretary reported that he had received forty-five nominations for the ensuing election of Council, and that the following twenty-three, of whom ten are Members of the present Council, had signified their willingness to accept office if elected:—

BAYNES, JAMES, 24, Waterworks Street, Hull.
BETTY, SAMUEL CHAPMAN, 6, *Park Street, Camden Town, N.W.*
BOTTLE, ALEXANDER, 37, Townwall Street, Dover.
BURDEN, EDWARD, 38, *Duke Street, Grosvenor Square, W.*
CARR, JOHN, 171, *High Holborn, W.C.*
CHURCHILL, JOHN, 46, New Street, Birmingham.
FRAZER, DANIEL, 113, Buchanan Street, Glasgow.
HAMPSON, ROBERT, 205, *St. John Street Road, E.C.*
HILLS, THOMAS HYDE, 338, *Oxford Street, W.*
MALDEN, WILLIAM WALTER, 195, *Brompton Road, S.W.*
OWEN, JOHN, 234, *Upper Street, Islington, N.*
RADLEY, WILLIAM VALENTINE, 74, Market Place, Sheffield.
SAVAGE, WILLIAM DAWSON, 30, Upper Bedford Street, Brighton.
SAVORY, CHARLES HARLEY, 143, *New Bond Street, W.*
SCHACHT, GEORGE FREDERICK, 7, Regent's Place, Clifton.
SHAW, JOHN, 24, Great George Place, Liverpool.
SMITH, EDWARD, 8, The Strand, Torquay.
STACEY, SAMUEL LLOYD, 300, *High Holborn, W.C.*
STARKIE, RICHARD STRINGER 4, *Strand, W.C.*
STODDART, WILLIAM WALTER, 9, North Street, Bristol.
SUTTON, FRANCIS, Bank Plain, Norwich.
URWICK, WILLIAM WALKER, 60, *St. George's Road, Pimlico, S.W.*
WADE, JOHN, 174, *Warwick Street, Pimlico, S.W.*

NOMINATIONS FOR AUDITORS.

The Secretary also reported that Mr. FREDERICK ANDREWS, of 23, Leinster Terrace, Hyde Park, had been nominated for election as an Auditor.

The Council thereupon nominated the following, in order to complete the list of five auditors:—

BARRON, FREDERICK, 2, Bush Lane, E.C.
HODGKINSON, WILLIAM, 127, Aldersgate Street, E.C.
HORNER, EDWARD, 20, Bucklersbury, E.C.
SQUIRE, WILLIAM, 5, Coleman Street, E.C.

CONVERSAZIONE.

A letter was read from the authorities of South Kensington Museum granting the use of the Museum for the Conversazione on May 15th; and the President, Mr. Hills, Mr. Sandford, and Mr. Williams were appointed a committee to make and carry out the necessary arrangements.

The Report of the Finance Committee was received and adopted and sundry payments ordered.

The Report of the Benevolent Committee was received and adopted and a grant of £10 made to the orphan of a late member of the Society.

The Secretary reported the death of Mr. Charles Thomas Anderson, of Jersey, one of the annuitants on the Benevolent Fund, who died on the first day of the quarter; and the Council ordered that the sum of £7. 10*s.* should be paid to his widow.

The Report of the House Committee was received and adopted.

The Committee having reported that several coats had been lost from the hall, the Council requested the President, Mr. Williams, and the Secretary to carry out the necessary arrangements for preventing the recurrence of such losses.

The Report of the Library, Museum and Laboratory Committee was received and adopted, and the following books recommended for the Library were ordered to be purchased:—

Deschanel's Natural Philosophy, by Professor Everett.
Orme's Introduction to the Science of Heat.
Johnston's Agricultural Chemistry and Geology, by G. T. Atkinson, B.A.
Harcourt and Madan's Exercises in Practical Chemistry.
Scoresby-Jackson's Materia Medica.
Brande and Cox's Dictionary of Science, Literature and Art.
Sundry numbers and volumes of *Annales de Chimie* and *Journal de Pharmacie*, to complete sets.

The Report and recommendations of the Parliamentary Committee were received and adopted.

Resolved—That the Registrar be instructed and is hereby authorized to erase from the Register the name of John Hall, of Liverpool.

It was brought to the notice of the Council that misinterpretations of the Pharmacy Act by coroners had seriously affected the reputation of Chemists and Druggists. A discussion ensued in which the President, Messrs. Atherton, Groves, Savage, Shaw, Sutton, Sandford, and Smith took part, and eventually it was resolved, on the motion of Mr. Sutton, seconded by Mr. Williams, that a circular should be sent to the Coroners throughout the kingdom, giving them an outline of the Act for their guidance.

The Report of the Provincial Education Committee was received. It contained an application from the Northampton Chemists' Assistants and Apprentices' Association, asking for a grant of £10 for books, apparatus, and chemicals, which the Committee recommended should be complied with.

It was thereupon

Resolved—That a grant of Ten Pounds be made to the Northampton Chemists' Assistants and Apprentices' Association, and paid to the guarantors.

As applications from other places had, on previous occasions, been made, in so informal and incomplete a manner that the Council had difficulty in dealing with them, and as in this from Northampton the purposes for which aid was required were so fully set forth, and gave such evidence of local efforts being made to advance education, the Council desired that it should be published *in extenso* for the guidance of others.

Note.—In the following form of application all the replies of the Association are in Italics.

TO THE COUNCIL OF THE PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.

Form of application for Grants in aid of Provincial Schools of Pharmacy.

Name of Association applying for Grant.	*The Northampton Chemists' Assistants and Apprentices' Association.*

(In the following divisions state the object or objects for which the grant is required, and the amount it is desired to appropriate to any or each of the following purposes:—

A For providing apparatus, specimens, diagrams, etc. Specify the articles required, and the amount of grant requested. . .	*Four sets of apparatus as per list. Value of the four sets packed complete in four boxes, £5.*

List referred to above.

A set of Evaporating Basins :—
One 6½ inch.
One 8½ inch. One 4-inch.
One 7¼ inch. Two 3-inch.
One Retort Stand and three Rings.
Two Test Glasses.
One Half-pint Flask.
One half-quire Filter Paper.
Two Porcelain Crucibles.
One Measure Glass, 5 oz.
One pair 8-inch Brass Crucible Tongs.
Two Glass Funnels.
One dozen Test Tubes (German glass).
One Black's Blowpipe.
One Test-tube Brush.
Two Soup Plates.
One Flat Plate.
Two Spatula Knives.
One Pair of Scissors.
One Round File.
One Triangular File.
One half-pound Glass Rod.
One half-pound Glass Tubing.
One foot Small India-rubber Tubing.
Three dozen Corks of various sizes.
Platinum Wire and Foil.
Test Papers.
A Nest of three Beakers.

(*This Set, packed in a case, can be obtained of any chemical apparatus maker for about 25s.*)

B For providing books, etc. for library. State the particulars of the number of books already in the library of the Association, the titles and prices of the books it is now desired to purchase, and the amount of grant requested.	*We have 29 volumes of books in library, including Pharmacopœia, Attfield's Chemistry, Bentley's Botany, Christison on Poisons, etc. We wish to purchase Pereira's Materia Medica, 25s. Fownes' Chemistry, 14s., Bentham's Flora, 10s. 6d. Asa Gray's Botany, 4s. 6d., total, £2. 14s.*
C For any other object. State the purpose for which the grant is required, and the amount requested.	*Four dozen 5-oz. W. M. German glass stoppered bottles, for solid chemicals, used in qualitative analysis, £1 10s., Chemicals for ditto, 16s.*
As the relative claim of any town to receive aid from the Society must be indicated by the EARNESTNESS AND EFFICIENCY OF LOCAL EFFORT state here any consideration which, in the opinion of the applicants, entitles them to a grant from the Society's funds.	*We have our room fitted with shelves, on which are 95 20-oz. W. M. stoppered bottles, 31 8-oz. ditto, 21 6-oz. ditto, containing standard specimens of materia medica of B. P., 1867. Also tables, chairs, bench, etc., and a number of apparatus (including a microscope lent by one of the members). There are 24 assistants and apprentices in the town, 22 have joined the Association. There are 17 chemists and druggists in Northampton, and of these 16 have given donations, and nine gifts of apparatus, or in other ways rendered substantial support. Each member pays 5s. per annum. The members conduct their own classes, advanced learners assisting beginners. Some Pharmaceutical Chemists also assist and advise if necessary. The classes instituted at present, are chemistry, botany, materia medica, and pharmacy, and we now desire, by the aid of the Parent Society, to add one on practical chemistry.*

G. C. Druce,
6, Drapery,
Northampton. } *Secretary of the above Association.*

Three Resident members of the Pharmaceutical Society.
James Barry, Northampton.
Wm. Richard Clarke, Northampton.
Edward Pullen, 43, Gold St., Northampton.

Dated—*March 5th*, 1872.

The PRESIDENT then drew the attention of the Council to a paragraph which had appeared in the *Chemist and Druggist*, reflecting on the character of Mr. Carr as a member of the Council, and said he felt it his duty to move a resolution on the subject.

It was moved by the PRESIDENT, seconded by the TREASURER, and resolved :—

That this Council have seen with regret a most unjust attack on their colleague, Mr. John Carr, in his capacity as Councillor, and desire to express their opinion that no member of the Council has been more faithful in his devotion to the interests of the Society, or more constant in his attendance at the various meetings during his tenure of office.

PROVINCIAL EDUCATION.

Mr. FRAZER then brought forward the following motion, of which he had given notice :—

"With a view to making a more systematic as well as a more liberal use of the funds of the Society in aiding Pharmaceutical Education throughout the country, I would propose that in future all applications for money votes for this purpose for the year be lodged with the Secretary of the Society not later than the 1st August annually, and that the Council decide at its usual monthly meeting in October. In the interval between the date of application and that at which the Council give their decision upon them, the Local Secretaries shall examine into the respective merits of each case, and report the same to the Council for its guidance in proportioning the sums to be voted to each applicant."

He commenced by stating that when he gave the notice, he was not aware that the question was causing any feeling in the country, nor had he been spoken to by any one, but it had been present to his mind ever since the meeting in July last, when he consulted Mr. Sandford about it. The balance-sheet for the last year showed that the money expended on provincial education was £48, which seemed a ridiculously small sum, and he believed the reason was the want of a better system for dealing with the question. He did not wish at the present time to go into the question of how much or how little should be voted for provincial education, but rather to enforce the necessity of introducing some systematic plan by which the wants of the country should be met. He thought if, after the balance-sheet were presented, a certain sum were set aside, whatever it might be, for provincial education, and then applications from various associations were entertained, they would be in a better position to deal fairly with all parties, and to accomplish the objects which they had in view.

Mr. SMITH said he was not quite sure whether or not there would be any advantage in combining Mr. Frazer's motion with the one of which he had given notice, namely—

"That the attention of the Provincial Education Committee be drawn to the inadequacy of the assistance rendered by the present system of 'grants in aid of Provincial Schools of Pharmacy;' that the Committee be requested to reconsider the matter, with a view to a more liberal and systematic application of the funds of the Society in aid of Provincial Education, and report thereon to a future meeting of Council."

Both their objects seemed pretty nearly identical. He had not intended to say more than half-a-dozen words in support of his motion, thinking any discussion upon it had better come in committee, if it were referred as he suggested. He agreed with Mr. Frazer that £48 was a miserable pittance to dole out for provincial education during the year, but he did not think the Council were altogether to blame, because they had consistently followed the recommendations of the Committee; and with regard to the Committee, there was this to be said, they were appointed to strike out a new path, a novel task was imposed upon them, and no doubt they did the best they could. Nevertheless the result showed that something more was needed, and he thought some steps should be taken to see if this state of affairs could not be altered. He did not say that the present system was not the best, but he should like it to be carefully considered.

Mr. Sutton said he remembered being on the Committee, and the discussions which took place, when it was the general opinion they were doing enough for the local associations in making the grants which they did, for if they gave the associations all they asked, he was quite sure they would do them more harm than good. On the other hand, there were, undoubtedly, cases in which students did not get the advantages they ought to have, and therefore it was the general opinion that an extension of these grants ought to be made. The question was, however, whether any such motion were required, for he thought the Committee were quite in a position to deal with applications as they came before them, and would, probably, in future do so more liberally than they had heretofore.

Mr. Smith said it was evident the present system wanted amendment by the result produced. One difficulty was in getting gentlemen to be sponsors for the materials sent to the associations. There were certain formalities to be gone through, which threw a difficulty in the way of making an application.

Mr. Greenish said many applications were made which had to be refused through not being in the proper form.

Mr. Williams said the question was whether the prescribed form was the best that could be adopted. He thought Mr. Smith's motion would meet the whole of the case, and it was a very fair question whether the present regulations were as perfect as they might be. A great many of their members, both in the country and at the Council, were of opinion that they were not. If that were so, an alteration should be made, but it must be done with caution.

Mr. Bottle said the subject-matter of the motion had his hearty sympathy, for he believed they were not rendering that assistance to the provinces which it was their duty to do. But he did not think this was a proper time to bring it forward,—just before the new Council were elected, when there might be a great change in the constitution of the Committee. He would suggest that it should stand over until after the General Meeting.

Mr. Smith said he thought there was nothing to be gained by delay; if they waited for a new Council, and then for that new Council to get regularly into work, half a year would be lost. At present there was really no system at all.

Mr. Atherton said the Society, some time ago, affirmed the principle of granting aid to provincial associations, and a system introduced by Mr. Reynolds was approved by the Council; that was subsequently changed again, and all within eighteen months. And the proof of the great advantage of the aid given by the Council, and the liberality with which it was given, was, that no applications, or comparatively few, had been made for it. He did not find fault with the Council, however, but with the system which wanted amending, but, at the same time, he agreed there would be no time to do so before the new Council came into office.

Mr. Hills suggested that the Annual Meeting would be the time to bring it forward.

Mr. Atherton said the subject was discussed at the Annual Meeting two years ago, when it was decided that this aid should be given liberally. They could not say that had yet been done.

Mr. Groves said he would second Mr. Frazer's motion, as he thought it was a thoroughly business-like way of dealing with the matter. If all the applications were received at the time when they knew how much money could be applied to the purpose, they could be dealt with methodically, whereas when they came at different times, the same members of Council were not always present; sometimes the vote went one way and sometimes another. He was, however, entirely opposed to any great alteration in the method of making these grants, and could not approve the idea of squandering money on little associations throughout the country, which could only give very imperfect assistance to students. He thought the great aim should be to establish in some three or four centres, an efficient system of education.

Mr. Williams thought the idea of making grants once a year a very good one, but the details ought to be considered in Committee.

Mr. Sandford thought that the Council did not stand on very good ground with its constituents with regard to this matter. It was understood two years ago that aid should be given to provincial education; since that time rules had been made and altered, but they had never had a clear understanding of what was to be done. Something more than what was being done was required, and he considered that more aid should be given to associations in the provinces, to promote education where local efforts have been shown and are insufficient. He held that there should be a decided evidence of inclination in the districts to help themselves, for if people would not help themselves, they could not expect help from the Society. The report of the Sheffield Pharmaceutical Chemists' Association referred with regret to the falling off in the classes, and "to the marked lukewarmness on the part of the apprentices to avail themselves of its advantages." The Council ought not to encourage that lukewarmness or assist people who did not endeavour to assist themselves. He would propose that the Provincial Education Committee be requested to consider the present regulations for granting assistance; and to assist them in their investigations, they should have before them the propositions of Mr. Smith and Mr. Frazer. He thought it had better be done at once before the Annual Meeting, so that they might be prepared with some explanation, when the question was raised, as it would inevitably be, upon that occasion.

Mr. Shaw said Mr. Sandford's proposition was practically the same as that of Mr. Smith. He referred to the manner in which various applications had been received, as showing that the system was very indefinite and undecided. He therefore agreed with the spirit of Mr. Frazer's proposition, although he preferred Mr. Smith's, because it necessarily embraced that of Mr. Frazer. The difficulty of getting gentlemen to become guarantors of books or apparatus had been referred to, but all these matters might be discussed better in Committee.

Mr. Hills thought the great part of the blame, if blame there were, rested with the members in the various towns. It must be remembered that the Provincial Education Committee had been trying an experiment, and past experience would no doubt enable them to act more efficiently in future. If these two motions were referred to the Committee for consideration, they might bring forward a system which would be more liberal and extensive; and the sooner they did so, the better it would be for the credit of the Council and the benefit of the country members.

After some further discussion, Mr. Smith's resolution was put and carried.

Mr. Frazer then withdrew his motion on the understanding that the subject matter would be considered by the Committee.

Exemptions from Jury Service.

Mr. Bottle then brought forward the following motion, of which he had given notice:—

"That a representation of the claims of registered Chemists and Druggists to exemption from service on juries be made by this Council to her Majesty's Attorney-General, urging the insertion of a clause to such effect in the proposed Juries Bill."

He said it was his privilege and pleasure many years ago to render some assistance in obtaining this exemption for Pharmaceutical Chemists. At that time the exemption was limited to Pharmaceutical Chemists, because they were a registered body, and it was said with regard to Chemists and Druggists, so called, that they could not be included, because there were no means of identifying them, and thus a large proportion of the trade did not receive the privilege which Pharmaceutical Chemists did. He considered it the duty of the Council to do what they could to assist chemists and druggists who were not pharmaceutical chemists, and he would therefore suggest that a representation be made to the Attorney-General on the subject. Chemists and druggists were not only fairly entitled to such an exemption, but they required it as much as pharmaceutical chemists, for many men of both classes in the provinces had not sufficient business to enable them to keep competent assistants to represent them in their absence, and thus when they were called upon to serve on juries, their business had to be neglected and the public inconvenienced.

Mr. Williams seconded the resolution, which he considered a very important one. It should be understood that they, as pharmaceutical chemists, had no wish to enjoy any privilege or monopoly which was not shared by other chemists and druggists. If it were right for a pharmaceutical chemist to be exempt from serving on juries, it was equally right that the chemist and druggist should have the same privilege.

Mr. Sandford said he should not be doing his duty if he did not say all he could in favour of the proposition. He had always held that chemists and druggists should be just as much exempted from serving on juries as pharmaceutical chemists. It was not any reward or privilege, but simply a provision for the benefit of the public, it being considered that when chemists were taken away from their businesses, the public safety was imperilled. It was on that ground alone that exemption could be asked for. The same principle ran through all exemptions of this kind. Certain men were exempt because they were servants of the Crown and might be influenced, others were exempt because they were servants of the public, and were more useful to the public in their private vocation than in the jury box.

Mr. Betty said he was not at all surprised at the view now taken by Mr. Sandford, because he knew it was that which he had always held. At the time of the passing of the Pharmacy Act, 1868, the difficulty about the general body of chemists not being exempt was got over, because a Committee was then sitting on general exemptions from serving on juries, under Sir William Erle. Had that Committee not been sitting at the time, the question would have been brought forward then, and the Act must either have been sacrificed, or the exemption of the whole body have been insisted upon. It was then said, however, that the matter was not ripe for decision, owing to the Government having a Committee sitting upon that very subject, but it would now be breaking faith with those with whom a sort of contract was entered into if the first opportunity were not taken of carrying out the wishes of the whole body, and obtaining for them the exemption from jury service.

The resolution was then carried unanimously, with the addition of the words "*That the Parliamentary Committee be requested to take action thereon.*"

REPORTS OF THE BOARDS OF EXAMINERS.

March, 1872.

England and Wales.

Examination.	Candidates examined.	Candidates passed.	Candidates failed.
Major........	7	5	2
Minor........	21	10	11
	28	15	13

Two certificates were received in lieu of the Preliminary examination, namely—University of Durham, 1; University of Oxford, 1.

Scotland.

Examination.	Candidates examined.	Candidates passed.	Candidates failed.
Major........	1	1	0
Minor........	3	1	2
Modified......	3	1	2
	7	3	4

The following letter was read and ordered to be entered on the minutes:—

Local Government Board,
(*Medical Department*),
Whitehall, S.W.,
28*th March*, 1872.

Sir,—I am directed by the Lords of Her Majesty's Council to inform you that Sir Robert Christison has ceased to act for their Lordships as visitor of the examinations held by the Pharmaceutical Society in Edinburgh, and that Dr. Douglas Maclagan, of 28, Heriot Row, Edinburgh, will now act in his stead; and I am to request that you will be good enough to see that notice is duly sent to Dr. Maclagan of the examinations which the society is about to hold.

I am, Sir,
Your obedient Servant,
John Simon.

Elias Bremridge, Esq.,
17, *Bloomsbury Square, W.C.*

Resolved—That the following, being duly registered as Pharmaceutical Chemists, be respectively granted Diplomas, stamped with the seal of the Society:—

Jones, Moses ....Swansea.
Kemp, John ....Inverness.
Maitland, John Edward ......London.
Morgan, Richard ....London.
Smith, John Francis ....Scarborough.
Webb, Herbert Charles ......London.

Resolved—That the following Associate of the Society before 1842, be elected a Member of the Society:—

Foulkes, William James ......Birkenhead.

Resolved—That the following Pharmaceutical Chemist be elected a Life Member:—

Benger, Frederick Baden ......Manchester.

Resolved—That the following Pharmaceutical Chemists be and are hereby elected Members:—

Bannard, Henry ....Epsom.
Bishop, William Middlebrook ..Lincoln.
Hughes, James ....Swansea.
Lake, Richard ....Brixton.
Morgan, Richard ....25, Brecknock Road, London.

Resolved—That the following Registered Chemists and Druggists be elected "Members":—

Alewood, Edwin	Swansea.
Black, John	Rutherglen.
Caswell, Edmund	Leamington.
Cattle, Henry Steed	East Retford.
Crampton, John	Sawston.
Cross, Charles	Winterton.
Field, Ebenezer	Cambridge.
Fletcher, Thomas	Smallthorne.
Gibson, John Brewster	Grantham.
Hollier, Edward Robinson	Shrewsbury.
Langford, William Henry	Wisbeach.
Marshall, Gervas	Accrington.
Morgan, Thomas Lloyd	Llandovery.
Oldfield, Henry	Hyde.
Ridley, Charles Henry	Reading.
Roberts, Meshach	Bangor.
Rutherford, Edward	Tow Law.
Ryder, John Lewis	Preston.
Smith, William	Nottingham.
Walford, Ryland James	Weymouth.
Whyte, William	Glasgow.

Resolved—That the following, having passed their respective Examinations, be elected "Associates in Business":—

MINOR.

Bolton, Charles Alfred	Nottingham.
Cockburn, George	Sunderland.
Elliott, Thomas	Boston.
Kirkman, Charles John	Stratford.
Wade, Walter	New Cross.
Wilkins, George	Tenterden.

MODIFIED.

Busby, James	Harpenden.
Evans, John	Devizes.
Gibson, William Humphrey	Brighton.
Hind, Thomas Wm. Linton	Kendal.
Kerruish, Edward John	Barrow-in-Furness.
Morford, Thomas	Stoke Newington.
Stanway, Edward Thomas	Wolverhampton.
Stenson, Joseph	Camden Town.

Resolved—That the following, having passed their respective examinations, be elected "Associates":—

MINOR.

Chambers, Pearson	Cockermouth.
Cottman, Henry	Poole.
Davies, Peter Hughes	Peterborough.
Henry, James Hay	Macduff.
Jones, Moses	Swansea.
Macfarlane, Patrick, jun.	Alexandria, N.B.
Modlen, Robert	Edinburgh.
Moss, Albert	Ilkeston.
Plowman, Sydney	Boston.
Stanford, Joseph Henry	Yarmouth.

MODIFIED.

Clifton, John Moore	Lincoln.
Kimber, James	Stamford-in-the-Vale.
Pierce, John James	London.
Plaister, William James	Kensington.
Plumb, James Edwin	Surbiton.
Purnell, Henry Albert	Hereford.
Snow, George Foster	Reading.
Stevenson, Richard Walter	Derby.
Taylor, Charles William	Brighton.
Thomas, David John	Bridgend.
Thomson, William	London.
Whittaker, John William	Stockport.
Wright, Arthur	Nottingham.
Wright, William John	Tunbridge Wells.

PHARMACEUTICAL MEETING.

Wednesday, April 3rd, 1872.

MR. A. F. HASELDEN, F.L.S., PRESIDENT, IN THE CHAIR.

The donation of a specimen of crystals of bisulphite of magnesia, by Dr. Archbold, to the Museum was announced by the CHAIRMAN.

Mr. INCE drew attention to some dried specimens of British algæ, which had been mounted in a very beautiful manner by simply immersing them in sea-water, and when the parts of the plants were disposed in a natural position, floating them over and lifting them out upon ordinary albumen paper, after which they were pressed.

Mr. CARTEIGHE said that, with regard to the bisulphite, he happened to see Mr. Archbold that morning, and as he was a gentleman who was occupied the greater part of the working hours of the day behind a druggist's counter, doing very ordinary and heavy work, and as he appeared to take an immense interest in chemistry, the Society felt indebted to him for any specimens of this kind. At the same time the mere statement put on the label, "Bisulphite of Magnesia," was hardly satisfactory without some evidence that the salt was constituted in the manner indicated by such a name. Bisulphites were popularly spoken of, but not many of them had been carefully analysed in a pure state; indeed, none of them had, practically, been so determined. He was sure they would all look forward to the time when Mr. Archbold would give them some experimental evidence as to why he gave the name of bisulphite to this compound.

The PRESIDENT said that Mr. Archbold had promised to send an account of the process to the Journal.

Mr. C. H. WOOD then read a paper on—

THE INTRODUCTION OF THE METRICAL SYSTEM OF WEIGHTS AND MEASURES INTO THE PHARMACOPŒIA.

[This paper is printed at page 801, and gave rise to the following discussion]:—

The PRESIDENT thought this was likely to prove a useful paper if it should induce most of them to adopt the metrical system where they could at once, for it would then be facilitating the process and preparing the way for the introduction of it into the British Pharmacopœia, and perhaps its use in England generally. He could scarcely see the advantage of introducing proportional weights and measures in a portion only of the Pharmacopœia, unless they could do it definitely through the whole of the book. It seemed to him that they could as easily learn the metrical system at once as they could by any intermediate system; although he did not set his opinion forth as of much weight, because he was not an analytical chemist, and he thought probably its use at the present time was more for analysis and research than anything else. Perhaps some other gentleman more conversant with the subject than himself might make some remarks as to whether it was desirable to adopt the metrical system at once, or to have an intermediate system between that and the present one.

Mr. M. CARTEIGHE expressed concurrence in what the President had said, remarking that if they were to have any more changes in their weights and measures, they should have one complete, final change, and there let the matter rest. A conservative tendency to change, if he might use the expression, was altogether a mistake; and he confessed that Professor Redwood astonished him immensely when, some months ago, he heard him propose a change which tended towards the metrical system, but which did not come up to it. The time had not arrived for a complete change. It seemed to him that they were beginning altogether at the wrong end. What they had to do was to put pressure upon the examining bodies of those who wrote prescriptions, and had to do with the doses of medicines, to insist that they should have some knowledge of the system which they were anxious to introduce. If this Society went on discussing the merits of the metrical system, it would have no effect elsewhere. If anything about the metrical system were mentioned to a medical man, he at once raised the difficulty that he did not know it, and had no notion of what was a gramme, or of the difference between a gramme and a grain. He did not know the volume of a centimetre, or the difference between a litre and a cubic centimetre. The members of this Society know how simple it is to learn and work with the metrical system; and if they were to use their influence with the Medical Examining Boards, they would better attain the object they had in view than by discussing processes which were in themselves important changes. He agreed with the President that any system which adapted itself only to one part of the Pharmacopœia was undesirable. He had formerly expressed the opinion, that if such gentlemen as Mr. Wood, for instance, would take the pains to issue a supplement to any existing Pharmacopœia at any given time, and adapt it to the metrical weights and measures, he would do more service to the system which he advocated, than by proposing any gradual change based on existing systems.

Mr. Martindale said that he had had some correspondence with Professor Redwood on this subject, but he (Mr. Martindale) was hardly prepared to introduce a plan at present. He wished to see the metrical system fully introduced, with the exception of one part, and that was the weighing of liquids. He could not think that English pharmacists would submit to weighing liquids in their continual dispensing, especially where there was much of it to do. If they could adapt a system of liquid measures corresponding to certain definite weights of some well-known substance, they might be able to have measures in place of those having such uncouth names as cubic centimetre, centilitre, or millilitre. The Paris Codex recognized the measures of tea-spoon and table-spoon, which he thought might be brought into service in the new system. A tea-spoon contained five cubic centimetres of distilled water, which would be about 84 minims. They knew that the tea-spoons and table-spoons of ordinary use were much greater than what the words were understood to imply medicinally. He thought those terms should be taken as a kind of unit of measure for preparing medicines as well as for administering them, and he should drop the term "ful" at the end of each, and merely say tea-spoon or table-spoon. He believed that this system would meet with the approbation of the medical profession much more than any vague system that might be adopted. Mr. Carteighe had said that the medical profession were entirely ignorant of the metrical system; but that was hardly correct at the present time, as the rising generation of medical students were made tolerably well acquainted with it especially as regarded the teaching of chemistry. Most of those that he met with were fairly acquainted with the metrical weights. They had an idea of what a gramme was, and what a cubic centimetre was; and he did not think there need be so much difficulty in this direction as Mr. Carteighe seemed to suppose. The great difficulty would be in reconciling the metrical measures with any system at present in use in England. He should object very strongly to Mr. Wood's plan, for the reason that he introduced such a quantity of fractions, which would be sure to be neglected where there was a great deal of dispensing. He could not conceive that these fractions could be practically carried out.

Mr. Frazer suggested that active agents for internal use should be made of equal strength. If the Pharmacopœia could enforce this in some way, so that they could always be certain of the average strength, it would lessen the danger of poisoning. He certainly agreed with Mr. Carteighe that if they were to have a change, it should be a radical change.

Professor Redwood said that, with reference to the general object of the proposition which he had made for the introduction into the Pharmacopœia of proportional numbers in the place of specified weights and measures, it had been assumed by Mr. Carteighe that evening, and by others who had either spoken or written on the subject, that it was to introduce something as a sort of transitional measure—something that was to be only temporary, and that was at some subsequent period to give way to a new method of expressing quantities to be used in the Pharmacopœia. Now, he did not admit that that was his object, or that it could be fairly inferred that it was intended as a mere temporary measure; and in confirmation of that he might refer to the fact that, in nearly all Continental Pharmacopœias, and certainly in the most modern of them, the practice of expressing quantities by specified weights and measures was entirely omitted, and the proportional numbers were used exclusively. He saw no reason why that should not be a permanent method of constructing formulæ; and the method which had been proposed was not, therefore, to be looked upon as merely provisional. With reference to the paper before them, he observed that Mr. Wood used a term for expressing quantities by measure, which certainly appeared to be very unobjectionable, and which he (Professor Redwood) should prefer to the one he had himself used in his paper. Mr. Wood had used the term "fluid part" where he (Professor Redwood) had used the term "measure;" and so far as he could see at present, he quite approved of the use of that term. He was not, however, prepared to go with Mr. Wood in the proposition he made for using specified weights and measures, as well as of the terms "part" and "fluid part." He thought that Mr. Wood had rather unnecessarily magnified the difficulty by assuming that which he (Professor Redwood) commenced by repudiating,—the retention in all cases of the proportions in the Pharmacopœia that were at present used there. He had looked to the simplification of the formulæ in the Pharmacopœia as one of the main objects to be contemplated by this change. Such simplification would be necessitated by the adoption of proportional numbers, and they would in that way get rid of a great deal of intricacy, which appeared to attach to the method which Mr. Wood had suggested. There should be no occasion for the use of fractional parts of grains, for instance, and there was no reason why proportions should be retained precisely as they now stood, necessitating in that way those minute fractions; and, therefore, if they were contemplating a simplification in the formulæ of the proportions of the ingredient, they should then adjust them to such a point as would admit of proportional numbers being used. He thought that the preparation of the medicines which were ordered in the Pharmacopœia, by the use of proportional numbers, might be greatly facilitated and simplified by the increase, to a small extent, of a certain class of preparations in the Pharmacopœia, which would be intermediate preparations to be used in the production of other preparations; as, for instance, where a minute quantity of essential oil is ordered in a preparation which contains spirit, if there were a spirituous solution of that essential oil of a certain definite strength, a quantity of that would be sometimes more conveniently used than the smaller portion of the essential oil in its concentrated state. Many of the cases which had been referred to by Mr. Wood would be met by the use of preparations of that description. In common with one or two of the gentlemen who had spoken, he (Professor Redwood) should say most decidedly that the introduction of proportional numbers, if it took place at all in the Pharmacopœia, should be made to apply to all the preparations alike and equally; that the formulæ should all be constructed in a similar manner, and that they should be so devised and arranged as to admit of the quantities being expressed in that way. If any great difficulty should be experienced in bringing about the changes of simplification, such as he had referred to—if opposition should be raised to such alterations as might for that purpose be required—he confessed he did not see any great practical difficulty or objection which would attach to the use of weights where measures were now ordered in the Pharmacopœia. He was quite aware that there would be great opposition to the introduction of weighing in the place of measuring in dispensing, but he did not think the same objection attached to the preparation of substances ordered in the Pharmacopœia. He had hoped that this subject would have been more freely discussed either at their meetings or in the Journal, for it was really very important. It was, moreover, a subject which the Pharmacopœia Committee of the Medical Council felt a great amount of interest in. He had been urged by that committee to endeavour to have it brought forward from time to time in this Society, and discussed. It was not felt by the Medical Council that they were at all taking measures which were otherwise than calculated to further the objects which the advocates for the adoption of the metrical system had in view, and which would certainly conduce to the general advancement of pharmacy. One great point that they had to bear in mind in the construction of the Pharmacopœia, was that they should assimilate it as far as possible with Continental Pharmacopœias. Whilst the Pharmacopœia remained as it was—whilst the formulæ were constructed as they were at present, the greatest possible difficulty would still be experienced on the Continent in translating them into formulæ that could be readily dispensed. So far as he had been able to ascertain, he believed the Pharmacopœia Committee were not unfavourable to the adoption of the plan he had suggested, with such modifications as might be urged by practical men, and that they considered it was the most efficient means of enabling medical men to introduce the metrical system of weights and measures. He quite agreed that such a change could not be suddenly made—that it could only be made by those men who first took it up, bringing it gradually into practice, and enabling others to become more familiar with the system, and more ready to adopt it.

Mr. Williams said it seemed to him that this was a part of a great fight going on between the odd-number men and the even-number men, and between the whole number men and the fraction men. He had a strong opinion that the whole number men who did without fractions were to be preferred to those who indulged in more scientific-looking formulæ. The great thing to aim at was simplicity, and he thought that theoretical perfection might be sometimes sacrificed for the sake of simplicity. There was one instance of that in the case of phosphoric acid; all the other acids were of such a strength that they neutralized an equal quantity of the alkali, but to do that they had to use an uneven number of grains of phosphorus to produce a solution of phosphoric acid. Many medical men had complained that they could not tell the strength of this acid. With regard to phosphoric acid, he suggested that there was no real necessity for making it of such strength as to neutralize a given weight of alkali, because it was always used as a free acid in dispensing, and was never neutralized. With regard to fractional numbers, he could not agree with Mr. Wood's theory at all. He thought Professor Redwood's idea was far preferable, and he should be glad to see the suggestion adopted of weighing all ingredients in making up preparations for the pharmacopœia. That was the way in which improvements might be effected and good practical results arrived at.

Mr. Wood in reply said he was afraid that he had not succeeded in making his meaning quite clear, for it was evident that several of the gentlemen who had spoken had not understood what he meant to convey. Professor Redwood had proposed that all processes in the pharmacopœia should be described in proportional numbers, a proposition which seemed to recommend itself for several reasons, namely, for its simplicity, and, secondly, because it afforded to those who were advocates of the metrical system an easy method of using a system to which they were attached. He (Mr. Wood) did not wish in his paper to convey the meaning that proportional numbers would be omitted in certain cases; on the contrary, he fully contemplated that they would be inserted in the Pharmacopœia to every preparation; and he also assumed it probable that, in many cases, the processes would undergo considerable simplification, so that they should have, not only proportional numbers, but proportional numbers of a very simple character; and anybody who wished to ascertain the strength of a preparation would see by the proportional numbers better than by any other system what its relative strength was. But, assuming that the Pharmacopœia was written in proportional numbers, and looking at it from the light of one who had to make preparations, or who had to use these proportional numbers, but who was not quite prepared to employ exclusively grammes and cubic centimetres; who liked to see proportional numbers in the Pharmacopœia because they simply expressed in the most perfect manner the primary relations of the ingredients to each other, but, liking that, nevertheless did not wish to buy new weights and measures, and to do everything in grain measures or cubic centimetres,—how was such a person going to translate these proportional numbers into the weights and measures he had got about him, and had hitherto used? It was rather difficult to judge of the position he should be in in this respect, because Professor Redwood had only given them examples of the liquors in those preparations where grains were employed. If they took the pharmacopœia, they might divide the preparations into two classes,—into one they might put all those preparations in which at present the ounce or quarter of an ounce was the lowest term of weight or measure used, which class would comprise most of the preparations of the Pharmacopœia. For that class of preparations the proportional numbers, simply and exclusively, would perfectly answer the purpose. But then there was the other class of preparations to which he was referring, where the grain was one of the terms of weight, and it was how to treat these preparations in which the difficulty consisted. It would necessitate their having a new set of measuring-glasses, and putting on one side the measuring-glasses graduated into drachms, ounces and minims which they were now accustomed to use. It appeared to him that that would create a certain amount of prejudice, and give rise to objection. It was possible to use the measures they had about them, but they must make a calculation to do it. They must calculate, say, what was the quantity in grains of strychnia that they were to take, which would be the 100th part of two fluid ounces, and in doing this, they might make a mistake. What he therefore proposed was, that in this class of preparations they should insert in the Pharmacopœia a column standing by the side of the proportional numbers, which would show he might take so many grains of strychnia and so much spirit to make up the strength of the solution. He wished to keep the proportional numbers, but if possible, to remove all obstacles from the path of those who might be prejudiced against any change, and who would cry out if they were put to the inconvenience of obtaining new sets of measuring-glasses, and had to learn the use of new terms of measuring. But there were other things besides liquors. There were infusions, tinctures, ointments and things of that sort; and he could hardly fancy they would like, in making infusions, for instance, to employ new measuring-glasses, graduated to grain measures, and yet he apprehended that would be necessary. Professor Redwood had not given them any example of the kind of simplification he would effect in these cases. Compound decoction of aloes, for instance, was to be simplified. If they could see the formula as it stood in proportional numbers, they would then judge how far it would be possible to make it with the weights and measures to which they had been accustomed. He (Mr. Wood) took the formula as it at present stood in the Pharmacopœia, and made out such proportional parts as appeared to him would effect a sufficient simplification of the preparation, short of making a radical alteration in it strength altogether; and he apprehended that in things which were of daily use—as many of these preparations were—it would be hardly safe to effect a radical alteration in the strength and proportion of all of them. He had given in his paper the formula for the compound decoction of aloes, which was tolerably simple as expressed in parts, but if he wanted to make a quart of it, what quantities ought he to take? He must either obtain a set of grain weights up to a considerable quantity, or a set of grain measuring-glasses to carry it out, or he must enter into a somewhat elaborate calculation by which he could ascertain what number of grains, drachms, or ounces would exactly fit this very simple relation of parts. And all he asked was that they should not throw the labour of doing this upon each individual pharmacist, but put it in the Pharmacopœia side by side with the parts, so as not to interfere with them. Several gentlemen had expressed considerable objection to seeing fractions or grains used, but if they were going to simplify these proportions, and were going to apply to them an utterly complicated and awkward set of things, such as their present weights and measures were, they must have fractions. There was no simplicity about their weights and measures, and they would not fit simple relations. One effect of the new system would probably be to disgust them with the defects of the present system of weights and measures; and, if so, it would tend to promote the adoption of the metric system. It was true that several Continental pharmacopœias had adopted, in all its simplicity, the course which Professor Redwood had proposed, namely, to use parts, and nothing but parts; but there were two things which made a difference between the Continent and this country in this matter, for there they weighed liquids as well as solids, which greatly simplified the matter; and he believed that on the Continent their weights and measures had never been in such a state of confusion as they were in this country. We had got an ounce which contained 437½ grains, so that there was a fraction to begin with, and unless they could make the ounce of some even number of grains they could not get rid of the fractions. Mr. Martindale had taken exception to the use of the term cubic centimetre, and thought it exceedingly awkward. He (Mr. Wood) quite agreed with that, but had used it in his paper for want of a better term. It appeared to him that the term fluid gramme would be simpler. Mr. Carteighe had suggested that before they could do much in the way of extending the use of the metrical system, they must begin with the members of the medical profession, and that appeared to him (Mr. Wood) to be an important point if they wished to make progress. Some time ago he prepared a table in which the doses in the metrical system were placed side by side with the ordinary doses, but he was stopped for want of a choice of terms; and he thought that if they could invent terms for the metrical weights and measures which would be unobjectionable for use amongst them, they would remove one great difficulty.

A paper by Mr. Histed, of Brighton, was then read on the "Occurrence of Copper in Cajuput Oil." The paper is printed at p. 804.

The President announced that the next evening meeting would be held on Wednesday, May 1st, on which occasion Mr. Greenish's paper, on "Pharmacy in Austria," will be the first paper read.

Provincial Transactions.

MANCHESTER CHEMISTS' ASSISTANTS' ASSOCIATION.

The last Ordinary Meeting of the session was held at the Mitre Chambers on March 26th; the President, Mr. Lane, in the chair.

A highly interesting paper was read by the Vice-President, Mr. Fewster, on the medicinal plants of the Nat. Order Papaveraceæ. The reader briefly described the botanical characteristics of the Order and the properties of the various substances contained in it, mentioning *Chelidonium majus*, *Sanguinaria canadensis* and the several varieties of the poppy. After giving the descriptive characters of the several opiums, the reader recommended the use of extract. papaveris in making syrup. papaveris, thereby ensuring a definite quantity of extractive. He also advised the use of equal parts of spirit, water, and glycerine for making up the pil. saponis, B.P., which thereby keeps pliant and may be rolled easily.

A most elegant preparation of syrup. croci was shown, made by cold infusion with glycerine added. This has been kept three months without growing turbid, and on dilution gives an amount of colour equal to freshly prepared syrup. The meeting concluded by a cordial vote of thanks to the Vice-President for the able manner in which he dealt with the subject. A general meeting is arranged for Thursday, April 9th.

Parliamentary and Law Proceedings.

Suicide by a Vermin Killer.

An inquest was held at Oldham on Friday, March 22nd, touching the death of a woman which was supposed to have occurred from the effects of poison. From the evidence it appeared that the deceased, in consequence of her pilfering habits, had been threatened by her son, with whom she lived, that he would send her to the workhouse. She was found in a convulsed state, and, after suffering considerably, died before the arrival of a medical man. Amongst some papers that were found in her pocket was one labelled "Battle's Lincoln Vermin-Killer—Poison."

The coroner asked whether any one had been to Messrs. Braddock and Bagshaw, who had sold the vermin-killer, to ascertain whether they had made a proper entry of the sale, and was informed that a constable had done so, but no such entry could be found, and it was suggested she had given a wrong name, whereupon he remarked that she ought to have been introduced by some one who knew her.

At the close of the evidence the coroner said there seemed to be a strong presumption that the deceased had died from the effects of poison. There was also every appearance that that poison was strychnine. He thought Battle's vermin-killer contained strychnine. If so, there came the question whether Messrs. Braddock and Bagshaw had sold it to her, and, if so, whether they had taken the precautions required by the Pharmacy Act.

The jury returned a verdict that the deceased had died from the effects of poison taken whilst in an unsound state of mind.

The Alleged Attempt to Poison by Tartar Emetic.

On Wednesday, March 27, the boy charged with having attempted to poison the Rev. Chichester Reade, by mixing tartar emetic with his wine (see *ante*, p. 778), was again brought up at the Clerkenwell Police-Court; but, in consequence of the unexplained absence of one of the prosecutor's maid-servants, who had given evidence against the prisoner at the previous hearing, the case could not be proceeded with, and the boy was released upon recognizances.

Conviction of an Assistant for Culpable Homicide.

At the Ayr Spring Circuit Court, on Tuesday, April 2, George Deans, a druggist's assistant, was charged with causing the death of Margaret Conner. The evidence given was to the effect that on the 16th February the deceased had sent her daughter to the shop of Mrs. King, Irvine, Ayrshire, for a pennyworth of Rochelle salt, and that the prisoner had supplied her with a packet containing salt of sorrel instead. Mrs. Conner, having received the packet, dissolved the contents in water, drank the greater portion, and died the same day in consequence. The jury, by a majority of nine to six, found the prisoner guilty, but unanimously recommended him to mercy. The Lord Justice Clerk sentenced him to two months' imprisonment.

Poisoning by Paregoric Elixir.

An inquest was held by Mr. Bedford on Tuesday, April 2, at St. Martin's Vestry Hall, on the body of Mary Dunn, aged 50. Mr. P. Dunn, bootmaker, 65, Drury-lane, stated that deceased was his wife, and that they had been married thirty-two years. Soon after marriage she became addicted to intemperate habits. About six weeks ago she left her home without assigning any reason, and had since been in an almost continual state of intoxication, and sleeping in a common lodging-house.

Mr. Thomas, chemist, 44, Drury-lane, said that during the last twelve years deceased had been constantly in the habit of purchasing paregoric at his shop. She took about six ounces every day, and sometimes twelve ounces, which would contain twenty-four grains of opium. On Good Friday she was supplied with about an ounce to to act as a sedative, as she had drunk ten quarterns of rum over night.

Police-constable Parker proved finding deceased in an insensible state on Good Friday, and taking her off to the Bow-street station, where she was at once seen by the divisional surgeon, who ordered her removal to the hospital. The house surgeon of the hospital stated that on admission, deceased was suffering from opium poisoning, and, notwithstanding the application of the stomach pump, she died in the evening.

The coroner remarked that the police had in this case exercised a proper discretion in consulting a medical man without delay, and that the comments in the public press on this subject had probably done some good. The jury found that the deceased had died from opium poisoning, but that the opium had not been taken for the purpose of causing death.—*Echo*.

The Betts Suits.

We extract from 'The Weekly Notes' a report of a test case on questions as to the costs argued before the Vice-Chancellor Bacon on the 16th March.

Betts *v.* Cleaver.

Adjourned summons, on the application of defendant, for the purpose of reviewing the certificate of the taxing master, disallowing the charge for attending and perusing plaintiff's affidavit of documents; and (2) the fees of employing a leader (Mr. Kay, Q.C.) in addition to two other counsel.

The plaintiff had filed fifteen bills against infringers of his patent, and by decree dated the 29th June, 1870, these bills were dismissed with costs. With respect to the first item of disallowance, it appeared that the defendant's solicitor attended at the Record Office, and perused the affidavit in Betts *v.* Cleaver, and finding that it corresponded, word for word, with a similar affidavit filed in Betts *v.* Willmott (of which he had taken an office copy), did not take an office copy of it.

The question on this item was, whether defendant's solicitor was entitled to a fee for perusal, although he did not take an office copy at the time.

With respect to the second item, it appeared that as soon as the bills were filed, Mr. Rolt, Q.C., was retained in one of the suits by a common retainer on behalf of the defendant, and shortly afterwards the papers were laid before him and Mr. Eddis to advise on behalf of the defendants, and they appeared upon a motion for leave to file a concise statement and interrogatories to be used in all the causes.

Mr. Rolt was shortly afterwards elevated to the bench, and Mr. Eddis continued to act as counsel for the defendants. Upon a motion by defendants, in May, 1869, to remove the causes from the paper until the cross-examination of the plaintiff should be completed, Mr. Kay, Q.C., was employed as leader to Mr. Eddis. An order was obtained upon this motion, and arrangements were made regulating the hearing of the causes. Before the hearing, Mr. Eddis took silk, and at the hearing, briefs on behalf of defendant were delivered to Mr. Kay, Q.C., Mr. Eddis, Q.C., and Mr. Langley. The taxing-master had disallowed the fee on Mr. Kay, Q.C.'s brief on the hearing, and the charge for a third set of papers, stating as his reasons that there was nothing in the nature, importance, or difficulty of the case to take it out of the general rule of the Court as to the allowance of more than two counsel, except the position of Mr. Eddis; that Mr. Kay, Q.C., had never been retained in the ordinary way for defendants, and his employment as leader to Mr. Eddis upon the interlocutory application on behalf of the defendant in May, 1869, did not amount to a retainer.

Kay, Q.C., and Eddis, Q.C., in support of the application to review the certificate of the taxing-master, contended, (1) that defendant's solicitor was not to be deprived of his fee for perusing because he did not take the unnecessary steps of taking an office copy; (2) that Mr. Kay, Q.C., having been already retained as a leader when Mr. Eddis took silk, the employment of three counsel ought to be allowed on taxation.

The Vice-Chancellor held the certificate wrong on both points, holding that defendant's solicitor was not to be deprived of his fee for perusing because he had not taken office-copies, and that there had been a retainer of Mr. Kay, by his having been engaged or employed in the course of the case. The case was an exception to the general rule that there must not be more than two counsel. The charge of 4*d*. per folio, and also the fees to Mr. Kay, would, therefore, be allowed.

Obituary.

We are sorry to record the death of Mr. Benjamin Peppercorn, of Lincoln, one of the founders of the Pharmaceutical Society, and for several years the Local Secretary. He died suddenly, whilst attending to his business, at the age of 47. He was much esteemed by the members of the profession in the city, where he had for years resided and conducted a lucrative business.

We regret also to announce the death of Mr. Charles Thomas Anderson, of Jersey, on the 25th of March, aged 66. Mr. Anderson was one of the annuitants from the Benevolent Fund, having been elected in 1870.

The following journals have been received:—The 'British Medical Journal,' Mar. 30; the 'Medical Times and Gazette,' Mar. 30; the 'Lancet,' Mar. 30; the 'Medical Press and Circular,' April 3; 'Nature,' Mar. 30; the 'Chemical News,' Mar. 30; 'English Mechanic,' Mar. 29; 'Gardeners' Chronicle,' Mar. 30; the 'Grocer,' Mar. 30; the 'Journal of the Society of Arts,' Mar. 30; the 'British Journal of Dental Science' for April; the 'Doctor' for April; the 'Oldham Chronicle,' Mar. 30; the 'Oldham Standard,' Mar. 30; the 'Medical Record,' Mar. 22; the 'Educational Times' for April; the 'Florist and Pomologist' for April; Evans, Lescher and Evans' 'Monthly Price Current' for April; 'Le Moniteur Scientifique-Quesneville' for April; the 'Journal of Applied Science' for April; the 'Grocery News,' Mar. 30.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily or publication, but as a guarantee of good faith.*

Election of Council.

Sir,—Having moved with some little prominence in the election of Members of Council last year, I am desirous of saying a word or two in reply to Mr. Giles' remarkable letter in the Journal of March the 30th.

In the first place, with an inconsistency almost sublime in quality, he deprecates all action likely to prejudice the "personal selection" of the members, yet the main object of his letter is to prejudice the minds of members against those who do not think with him, and to canvass through the columns of the Journal for a personal friend. So much for Mr. Giles' consistency.

I do not think there is a pressing need to defend the action of those who moved in opposition to further needless penal enactments for regulating the storage of poisons, and in opposition to a small party who would have accepted the new bonds with devout acquiescence.

The majority of the members in an effective manner, unmistakably expressed their will on this question, and the Bill was withdrawn. This majority was not a mere "faction," as Mr. Giles asserts, but the intelligent preponderance of the voice of the members themselves, which afforded "the best guarantee for the creditable direction of the Society."

What does Mr. Giles mean when he characterizes the members who thus moved in opposition last year "as the most tumultuous element"?

This species of misrepresentation will not mislead any one who understood the important issues of last year's contest, neither will it serve his self-evident purpose, but will rather recoil with advantage to those he would unfairly stigmatize.

I will not follow the example of Mr. Giles by offering an opinion upon any of the candidates for the forth-coming election. I have no doubt the constituency, alive to the exigencies of the hour, is quite able, and will also make a wise selection.

Robert Hampson,

Late Hon. Sec. to the Chemists' Defence Association.

London, April 2nd, 1872.

Sir,—I am surprised to find in your last number a letter from Mr. Giles commencing with a protest against the advocacy of any candidate for the office of councillor on party grounds, and concluding by advocating the election of one of his own party.

He professes to give us "general considerations affecting the choice of Council;" but the only consideration of any weight he offers, is that there ought to be "a sufficient proportion of London members."

I quite agree with him that it would much facilitate the management of the Society's affairs if the greater part of the Council could be elected from London pharmacists who would fairly represent the interests and feelings of the majority of their fellow-tradesmen. But it appears to me that a metropolitan residence is a consideration entirely subordinate to their qualifications as men of known ability in the administration of public affairs, and as men known to be in harmony with those for whom they are to act. So much importance do I attach to these latter circumstances that I would even elect all from the provinces, if that were necessary to avoid the anomalous position lately occupied by the Council who were acting in opposition to the majority of the constituents.

The little weight which I acknowledge attaches to Mr. Giles' first proposition is totally wanting in his second. He objects to provincial towns sending councillors for a number of years in succession.

Mr. Edwards of Dartford, Mr. Mackay of Edinburgh, Mr. Savage of Brighton, and various others have held seats in the Council for a number of years in succession, not that Dartford or Brighton had special claims, but that they were fortunate enough to have men of representative character and administrative ability who were able to devote time to the affairs of the Society. Nor can I see any reasonable ground for objecting to two members being sent from the same town; it is rather an advantage than otherwise that members be not entirely isolated, the opportunity for conversation upon topics of interest between Council meetings is not without value in clearing up difficulties, and so saving the time of the meeting. If Mr. Stoddart and Mr. Giles were both in office, that would not prevent me voting for Mr. Schacht; not that three councillors are required to give Clifton a fair representation, but that Mr. Schacht is well known for the qualifications which would justify his being elected to represent Clifton, Newcastle, or any other town.

Mr. Giles is very unhappy in his objection to Liverpool and Manchester between them sending three members. If what I have already said were not a sufficient reply to his objection, we might, on his own principle, justify the appointment. Lancashire, being one of the most populous counties in England, should naturally send more members to Council than others. But it is unnecessary to say even this in justification, for it is well known that Messrs. Brown and Woolley were not elected in consequence of Manchester requiring any special representation at Bloomsbury Square, but because the provincial members of the Society felt that the London members of Council were not in harmony with their constituents, and Messrs. Brown and Woolley were elected to represent the provinces.

Mr. Giles also attempts to draw a parallel between the Council and the Board of Examiners, but the difference is so palpable as scarcely to require a reply; any one can see that science is acknowledged the same by all classes of the community, but that politics and business interests vary according to the circumstances and neighbourhoods in which these classes are placed.

So much for the preliminary portion of Mr. Giles' letter, nor do I find the conclusion any more satisfactory.

When in the first paragraph he expresses a hope "that members may be permitted to exercise their own choice," the exercise of which has never been interfered with, we can only suppose he means—uninfluenced by the public advocacy of any individual, or it may be, he would only object to such influence being used in furthering the interests of a party, but in this respect he is most unfortunate. While he cannot but see that as regards the coming election, he is the first to break the rule he advocates as far as it relates to advocacy of individual claims, I can only suppose that he is not aware how much his letter appears to onlookers to be written for party purposes.

Mr. Giles was conspicuous in the attempt to force the compulsory observance of a code of regulations for the storage of poisons, which did not meet with general approval; this of itself should induce a careful inquiry into the merits of his nominee. The grounds upon which he recommends him appear to be, first, that he is a Londoner; second, that his father was a president of the Society; third, that he was a fellow-student of Mr. Giles; and fourth, that he is the fortunate successor to a lucrative business of high repute.

I would be sorry to think that these were the best recommendations that could be given to Mr. Savory, but they are such as Mr. Giles offers, and we have to consider if they are such as should induce us to elect him one of those who may have to pilot us through troublous times.

Looking back to last summer, and considering the statements of Mr. Sandford, who may be regarded as the spokesman of his party, we find him (August 5th) expecting—probably hoping—that Parliament will come upon us again shortly with something more stringent, and, to us, more objectionable, than the bill thrown out last session; and Mr. Sandford, no doubt, counting upon the assistance of the signers of the circular which he published in July 22nd, 1871, enabling him to carry the expected measure, as they hoped to have carried the late bill, in opposition to the wishes of the majority of the trade, it behoves us to elect such men as we have good reason to put confidence in. It will be remembered how much disappointment was felt by some provincial electors who voted for Mr. Carr and Mr. Smith in the expectation (was it a tacit understanding?) that they would vote against the adoption of any compulsory regulations for the storage of poisons, yet claiming the right to vote the contrary way as soon as elected. With this before us, we ought to have substantial grounds for believing that our candidates would vote in a satisfactory way should the great question of the past year again arise.

Mr. Savory's name not being known to us as a writer on pharmaceutical politics, we are obliged to draw such conclusions as we can from the position taken by his nominator at the meeting where the Council had so far yielded to external pressure as to propose recommendations for voluntary adoption instead of compulsory enactment; and from the signature of Savory and Moore being appended to the circular by which Mr. Sandford endeavoured to make the members of Parliament believe that the amendments to the proposed bill had completely removed the objections to it (see JOURNAL, July 22nd, 1871). Of course, all who signed that circular are responsible for the assertion that the proposed regulations were highly conducive to public safety, and were practised in the best-regulated establishments; yet, when respectfully invited (August 19th, 1871; p. 159) to show, in some few details, how they overcame some of the anomalies and difficulties which had frequently been pointed out, not one of the hundred and twenty was found willing to give the information which should have been valuable to the trade at large, and smoothed the way to an ultimate settlement of a long disputed point.

Until the appearance of Mr. Giles' letter, I intended simply to consider the bearing of these observations and vote accordingly, without saying anything to influence the votes of my neighbours; but since he has offered for the guidance of voters general considerations which do not satisfy my judgment, I am induced to make such additions as appear to me to have more weight.

I have endeavoured to avoid saying anything likely to be offensive to Mr. Savory, with whom my transactions have always been most agreeable; but it is one of the difficulties of provincial voters that, in the event of a candidate not being a writer to the Journal, his views are necessarily almost unknown.

BARNARD PROCTOR.

Newcastle-on-Tyne, April 1*st*, 1872.

Sir,—I have no desire to reopen the discussion on the Poison Regulations, but as Mr. Giles has thought proper to impugn the action taken by the Defence Associations in reference to the election of Council last year, I wish to remark that since that question was the point on which the election turned, and the great majority of the trade was opposed to the enforcement of those restrictions, it was a matter of importance that the opinions of the candidates should be known, and the practice he complains of was of necessity adopted, seeing that the electors could not become acquainted with "qualifications" by any other means.

I would also remind the members that although the question of compulsory regulations has been in abeyance since the withdrawal of the Pharmacy Act last year, it has promoters out of the Society, and supporters in; and if brought forward again, our only hope of successfully resisting its enforcement is to be careful in sending men to the Council who will meet any attempt at such vexatious and unjust legislation with the most determined resistance.

Mr. Giles speaks of a "faction list," but I would be glad to know whether he considers it a more factious proceeding for a committee to put out a list of candidates acceptable to the majority, or for an individual member to attempt to enforce compulsory regulations on the trade at the annual meeting when they had been withdrawn by the Council, and when many persons who would have opposed them stayed away, believing the question settled; or for another member to obtain the signatures of a few London and provincial firms to a document "presuming to point out that all objections had been removed," and sending it privately to members of Parliament, asking them to support a Bill which the majority of the Council, and all the provincial associations, were endeavouring to the utmost of their power to prevail on Parliament to reject.

As to the proportion of London representatives, I do not think any of us would object to their number being increased if they were men who understood and would care for provincial interests; but, unfortunately, with but few exceptions, their thoughts have not been our thoughts, and their wishes not our wishes, consequently, we have been obliged to send those who do know our wants and will uphold our interests; whilst the question of a man's locality seems to me of little importance if he be a suitable and able representative, neither do I see any very great objection to the "election of two members of Council from the same provincial city," if their qualifications be otherwise good.

I do not care to urge the special claims of Lancashire to send three members to the Council, more especially now that by the retirement of Mr. Woolley the number is reduced to two; but I think it will be allowed that, if wealth, population, industry, and influence are taken into account, Lancashire is quite as much entitled to send three representatives as that corner of the kingdom in which Torquay, Weymouth, and Bristol are situated, is to send a similar number, or the South Coast, including those three towns, to send five. With regard to the double representation of Manchester, which has been a grievous thorn in the side of so many, and of which Mr. Giles says, "we all know the means by which it was accomplished," I venture to tell him that there are not six people out of Manchester who are acquainted with all the circumstances by which it was brought about, and he certainly is not one of the number; and I say further, that it was neither sought for by the Manchester chemists, nor by the candidates themselves.

As regards Mr. Savory's candidature, I have only to say that as far as I am concerned, individually, I should be glad to see him elected; but I cannot help thinking that his success would have been more promoted had his nominator refrained from advocating his cause, for if there is one man less likely than another to influence the constituency in favour of any candidate, it is Mr. Giles.

W. WILKINSON.

Cheetham Hill, Manchester.

Sir,—May I be allowed to ask in what school Mr. Giles studied logic, or by what mode of reasoning he comes to the conclusion that whilst it is highly irregular and undesirable for a body of gentlemen to unite in seeking to promote the election of certain others, whose views on pharmaceutical politics they publicly make known to the constituency, it is yet perfectly justifiable for one solitary individual, whilst deprecating the proceeding in others, himself to have recourse to strikingly similar means in order to secure the election of a personal friend?

Mr. Giles evidently approves of the system which he denounced in spite of himself, the last clause of the first paragraph of his letter embodying the very idea to the fullest extent; for, apart from advertising the views of candidates, it is self-evident that an overwhelming majority of the constituency must be totally ignorant even of the names of many of the gentlemen, until they annually receive the list from which they are called upon to select their representatives, how then can they choose men of "known qualifications" without being previously informed?

If Mr. Giles will forgive the liberty, I would venture to paraphrase the clause, to which I refer thus—"Let us hope that these efforts to secure a true representative Council may not long need repeating, but that for the future our members may be permitted to exercise their own choice of men, by having the qualifications and views of candidates upon the leading questions of pharmaceutical politics clearly made known beforehand by the gentlemen themselves, which alone will afford the best guarantee for the proper election of Council."

EDWIN B. VIZER.

63, *Lupus Street, Belgravia South.*
April 3*rd*, 1872.

EARLY CLOSING.

Sir,—I have read with much pleasure the letters on the above subject which have appeared recently in the columns of the Journal. Seeing, however, that you deem it unadvisable to publish the opinions of all your correspondents, I should not have troubled you but for the reason that, having had my own period of daily labour shortened during the past four months by an hour and a half per day, I thought it might interest some of your justly dissatisfied correspondents to know how I attained that desirable end. Early in the spring of 1871, a petition was presented from the assistants and apprentices to all the chemists and druggists in this neighbourhood, requesting their signatures to an agreement to close their respective places of business not later than 8 o'clock P.M.

Only five, however, of the six chemists could be induced to concede to this request, the sixth not being able to see how any possible good could accrue from the adoption of the plan; and hence, for the time, our object was frustrated. In the winter, however, prompted by our all-but success in the spring, and by the simultaneous adoption of the nine hours' system in the iron and other trades, we made another attempt. The result this time was very different: the gentleman who previously thought that 9.30 P.M. was early enough to close, seeing that he was contending not only against the spirit of the age, but, also (what to him was of far greater consequence), his own constitution, not only signed our petition, but—all thanks to him—brought such influence and zeal to bear as to make our effort a perfect success. He has lately communicated to me the fact that the three months immediately following the concession have, in a pecuniary point of view, been the most successful he has had since his commencement in business.

Surely this one fact is worth more than all the unsupported assertions to the contrary by the opponents of early closing.

GEORGE SAMUEL HIGHMOOR.

Hunslet, March 30th, 1872.

PHARMACY IN THE LABORATORY.

Sir,—Allow me to string together a few thoughts on this subject, which occurred to me on reading Mr. Ellwood's letter in our Journal of 23rd ult. The first thing which struck me was the very limited capabilities which that gentleman seems to credit us with when he in effect asks how many pharmacists there are who have the necessary skill and experience to manufacture their own sp. ether. nit., sp. ammon. arom., etc. Surely, Mr. Ellwood does not point out these preparations as presenting peculiar difficulties, and requiring such consummate skill in their production, as only wholesale druggists and those having expensively fitted laboratories can successfully combat with; for allow me to inform him that, when I commenced business and had no laboratory at all, but merely a back counter, combined with enthusiasm and a gas furnace, these are two preparations which I always made, if not with positive profit commercially, certainly with much gratification to myself, and, in the case of the first mentioned especially, of a much superior quality to that usually sent out by the wholesale druggist, for it seems to me that this is one of the most unsatisfactory preparations as regards strength and uniformity that the pharmacist can buy. Let me ask Mr. Ellwood how often he has met with the bought product answering the tests of the pharmacopœia, or that will show any separation of ether at all when treated with $CaCl_2$, as there directed? With regard to the remaining preparations he mentions, viz. lin. aconit. bellad., liquid extracts, confections, expressed juices, etc., let me assure him they can all be prepared with positive profit, as well as of superior quality to those purchased. This is particularly the case with conf. sennæ, ext. coloc. co., ext. cinchon. flav. liquid., ext. ergotæ liquid., resin. podophyl., and a number of others; and I maintain that every pharmacist with a fair dispensing business, employing one or two assistants, and perhaps an apprentice, is able, or should be, to prepare all the galenical preparations of the pharmacopœia; and I can assure them, from a personal experience of six years, it would be much to their advantage to do so, for who is likely to bestow most care and attention on their preparations,—the man who is anxious to make himself a reputation with the physician and his customers, or the man who merely strives to produce at the lowest possible cost and sell cheaper than his neighbour?

The fitting up of a laboratory need not be a very expensive affair, nor need it take up a very large space; in my case a back kitchen does duty, fitted with one of Coffey's "still and condensing apparatus," with which, although by no means the best adapted for the purpose, I find little difficulty in preparing all the galenical preparations of the pharmacopœia. Add to this an iron mortar and pestle of good size, press, mill, and a large stone mortar with wooden pestle for bruising fresh herbs, roots, etc., and little else will be required to successfully carry on the manufacture of preparations for home consumption; and to my mind it is scarcely possible to conceive any more delightful recreation from the drudgery of shop, than superintending and carrying on the manipulations required for the production of the various preparations used in medicine.

I was exceedingly pleased to read the expressions of our worthy brother Mr. Groves upon this subject, and most heartily endorse the majority of them, but regret that I feel bound to differ from him in thinking "the distilling of aromatic waters mere waste of time and trouble." With the majority of them, the superiority of the distilled over the undistilled admits of no doubt; especially is this the case with aq. cinnam., anisi, and fœniculi, and the patient who at one time has his medicine prepared with the distilled product, and at another with the undistilled, will not fail to notice a very decided difference. With regard to chemicals, the case stands differently. There is no need for the pharmacist to prepare these, as they are all easily tested as to purity and correctness, and should be before being taken into stock.

I will conclude by earnestly recommending all pharmacists to make, as far as possible, their own preparations, and they will soon find out, like myself, that "it pays."

ALFRED E. TANNER.

128, *Prescot Road, Fairfield, Liverpool.*

Sir,—I feel myself quite unable to agree with Mr. Ellwood's letter in your issue of the 23rd ult. The hours during which a chemist is engaged in business are so long that with a little judicious management, it would be odd indeed if he could not find time for some practical work, my own experience tells me that such might always be the case. Moreover, practical laboratory work would be to a man having adequate knowledge a very pleasant relief to the dreary monotony of the shop. What too, would I ask, is the use of the laboratory at the Bloomsbury institution if the students never follow up in after life the knowledge they there acquire? Every one knows how soon facts are forgotten, unless there is something to keep them impressed on the mind, hence I fear that if our journeymen leave the School of Pharmacy, go into business, and follow Mr. Ellwood's advice, they would soon find that the time and money they had expended in qualifying for the examinations would be utterly wasted.

Mr. Ellwood assumes that with a large business, practical working may be carried out with commercial advantage, but my experience in this direction, extending over some thirteen years, has indicated to me that most of the pharmacopœia preparations can be made, and not only made, but often at a less price, never higher, than that for which they are to be obtained from the wholesale house.

There is moreover this advantage, that the supply can be accurately adjusted to the demand, just so much can be made as experience has pointed out will be consumed before deterioration of the product takes place. Nor is the use of expensive apparatus at all either necessary or desirable. I always make (to take those preparations singled out by Mr. Ellwood) my own sp. æth. nit., ap. am. ar., linim. belladon., succus. tarax., ext. cinchon. liq., etc., and I have no hesitation in saying that, though the means adopted are the simplest, yet the preparations themselves are in every respect equal to those made elsewhere.

Nor is this all that is to be said in favour of the argument, for, uniformity in product is more likely to be secured by this means than by any other, and (without wishing for one moment to disparage the preparations made by the wholesale houses) the chemist is assured beyond the shadow of a doubt that his preparations are what they are intended to be. Neither should the fact be lost sight of that all the different pharmaceutical operations of distillation, percolation, filtration, expression, etc., together with an acquaintance with many drugs and chemicals which would hardly ever come under notice in the ordinary way of dispensing and retail, are kept before the mind, and conduce equally to the benefit of master, assistants, and apprentices.

I therefore for my part hope that chemists, especially the rising generation, will not be led away by erroneous arguments, but at least give the matter a fair practical trial, and so discover whether "making" or "buying" best suits their individual case.

J. H. BALDOCK.

South Norwood. April 2nd, 1872.

J. Finch.—In answer to your communication, stating that the monthly part of the Journal had not reached you on the 4th, we beg to say, for the information of yourself and others, that, in consequence of the intervention of the Easter holidays, some little delay occurred in the binding.

"*Pharmaceutical Chemist.*"—The formula forwarded by you can hardly be looked upon as a "prescription" in the ordinary sense of the term. See an answer to a similar question, *ante*, p. 660.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. J. E. Bradshaw, Mr. R. W. Giles, Mr. Rimmington, Mr. Hustwick, Mr. Baildon, Mr. Brown, Mr. J. Babtie, Mr. Bennett, Mr. Pocklington, Mr. J. Finch, Mr. Staples, X., "Edward," "Henbane Dwining."

THE MICROSCOPE IN PHARMACY.

BY HENRY POCKLINGTON.

(*Continued from page* 783.)

Adulterations of, or with, products of Underground Stems.

The readiest thing of the sort for the beginner in microscopical analysis to try his 'prentice hand upon is chicory. He may, in the first instance, restrict himself to attempting to detect its presence in coffee. The difference between the tissues of the coffee berry and those of chicory are well marked. First, as to the salient features of the tissues of chicory. The cells of the parenchyma are somewhat varied; in the looser portions of the root they are rounded, almost spherical; in the neighbourhood of the vascular system they are much elongated, but nowhere much modified by secondary deposits. Treated with iodine solution, these cells are rapidly stained yellow (I speak of the unroasted root), and their contents (protoplasmic) intensely brown, and the subsequent addition of sulphuric acid* produces the characteristic reaction of cellulose.

The "porous" or "dotted ducts" (Henfrey, I think justly, prefers the term "pitted") are particularly abundant, and, being large, easily discernible by the unassisted eye. Their arrangement is eminently radial. The pits are boldly marked, and oblique with reference to the long axis of the cell. The size of the pits varies much with the age of the stem or portion thereof, but they are never absent. The laticiferous vessels are of the chief diagnostic value, and should be carefully examined. They are, of course, in appearance tubes, small in diameter and frequently anastomosed. Their contents are not met with in the roasted article, and have not been, so far as I know, satisfactorily determined. The points to be borne in mind are their size, distribution and number. Sections made in each of three directions from the fresh root should be mounted in glycerine, but powder from roasted specimens, *prepared by the analyst himself*, should be mounted in "dammar" and also in glycerine. The structure of the coffee berry should be noticed here, before we discuss further its adulterations and those of its chief adulterants. The structure of the coffee berry consists of somewhat angular cells, whose walls are much thickened by sclerous deposits, the primal wall having apparently been absorbed, so that it is difficult to isolate the several cells of which the berry is composed. In these cells there may be found, in its "raw" state, numerous globules of essential oil. The quality of the coffee may be estimated from the quantity of these oil globules present. The *testa* of the berry is very different in structure from this, and can hardly be confounded with any other substance likely to be used as an adulterant; and is composed of somewhat irregularly shaped cells, in at most two layers, having indistinct traces of secondary deposits (in an interrupted spiral) upon their walls. Between the testa and the berry is a very fine membrane, of somewhat undecided structure. A very slight familiarity with the structure of the coffee berry is sufficient to enable one to detect the presence of all ordinary adulterants, and a more careful observation will enable the detection of any attempted substitution of an inferior berry for the high-class so-called "Mocha" or "Plantation." It is hardly necessary to say that specimens should be "put up" of various sections of the berry in its raw state, and also of different varieties in a roasted and powdered condition. Glycerine and dammar are the best media.

The analyst must familiarize himself with the microscopic character of the most common adulterants of coffee and chicory. These are, in addition to chicory, roasted cereals (wheat, beans, etc.), roasted sawdust, acorns, caramel, mineral matter to give colour, roots, as mangold wurzel, etc. (Hassall). As to the frequency of the adulteration of coffee, there can be little doubt. But that either coffee or chicory are largely adulterated with roasted cereals or the like at the present time, I am not able to say of my own personal knowledge. Of the great number of specimens of coffee that I have examined during the past few years, but *one* has contained anything besides chicory. The one referred to contained nothing worse than roasted beans. Chicory is largely used, and often in such a way as hardly to constitute an adulteration; but more often, in low-class shops, in so large a proportion as quite to justify the appellation chicory and (a little) coffee. My friend Mr. C. P. Gibson has turned his attention to this subject somewhat closely of late, and informs me that his experience accords with mine, that whilst in "cheap" coffee a large quantity of chicory is always present, there is seldom anything beyond.

We will now attack the "roots" of the Pharmacopœia.

Glycyrrhizæ Radix.—A microscopic examination of the root of the liquorice plant will follow the same general course as that of chicory. My description applies to a medium-sized stem of good quality.

Medulla.—Present and occupies from $\frac{1}{5}$th to $\frac{1}{3}$rd of the diameter. Cells of medulla moderately large, thickened by increments of cellulose, not lignine. Shape globose modified and irregularly compressed; outline in transverse section sinuous; inner cellular spaces small and irregular. Contents: starch, crystals, and a viscid fluid, probably uncrystallizable sugar; starch-granules oblate, nearly egg-shaped; hilum distinct, often seen as an elongated cavity, gives no cross with polarized light, and is but very doubtfully doubly refractive; crystals probably of oxalate of lime, and give very beautiful and characteristic rings with polarized light.

Medullary sheath.—Absent. Vascular wedges of woody zone takes its place.

Wood zone.—Extends $\frac{1}{3}$rd of diameter of root, consists of nearly equal radial vascular wedges and interposed medullary rays.

Vascular system.—Dotted vessels of very varying size, completely perforate in some of the older roots; more or less perfectly septate (divided by complete or incomplete septa); larger vessels thickened by sclerogenous deposits, which are deeply stained by magenta, and are situate in elliptical bundles of woody fibre (which take the magenta stain less deeply); the dotted vessels and woody fibres appear to serve as the receptacula of the yellow colouring matter of the root; the woody fibres have relatively

* The use of strong acids is attended with some risk of injury to the front lens of the objective, and also to the brass-work of the stand or stage. To obviate these risks, Mr. J. E. Winspear, of Derringham Street, Hull, has devised, at my suggestion, a "medical" microscope, in which the "limb" carrying the "body" is made to fall back, and the lenses thus removed from the fumes of the acids until they are actually required for observing the effect produced. The stage plate in this instrument is of glass.

large central cavities, and their walls appear little consolidated by secondary deposits.

Parenchymatous cells of wood zone are smaller, somewhat similar in shape to the cells of the medulla, and have similar contents.

Medullary rays.—Elongated prismatic cells.

Outer zone.—Consists of cellular tissue, with regularly distributed ligneous bundles, with an investing membrane of flattened bark-cells; the ligneous (liber) cells little consolidated with secondary deposits; tissue of this zone loose, and corresponds to bark layers of above-ground stems.

The student will find the use of magenta-staining fluid of great service in making out these details of structure. I generally use Judson's magenta, one or two drops to an ounce of alcohol. The section should be immersed in the fluid for a few minutes (the more dilute the fluid the longer the time required and the better the results), then well washed in alcohol before mounting in glycerine or glycerine jelly. In a successfully stained specimen the whole of the wood-cells, vascular vessels, and other sclerogenous structures will be intensely stained, whilst the other tissues will be unaffected by the dye.

The characteristics to be borne in mind in examining the powder of the root are chiefly the size, shape, and optical characters of the starch granules, the shape, size, and nature of the "raphides," and the relative proportions of woody fibre, medulla-cells, vessels, and cellular tissue of the outer zone.

The principal adulterants of powdered liquorice are wheat and other flours, foreign woody-fibre (Hassall), turmeric, various starches with turmeric for colour, mineral matter and cane sugar, and starch sugar. The whole of these, with the exception of the mineral matter and starch sugar, are easily to be detected, even if only present in small quantities. The adulterants of liquorice in the form of pipes, lozenges, paste, confections, and extracts are not so easy of detection, when they go beyond the common-place addition of starches, turmeric, etc. to the paste form. Of the extracts, I may have occasion to say something, with certain tinctures, in connection with other apparatus than the microscope *pur et simple*, by-and-by.

VESICATING INSECTS.

BY M. C. COOKE, M.A.

(*Continued from page* 744.)

VIOLET OIL BEETLE, *Meloe violaceus*, Leach; violet; head and thorax finely punctured, the latter with a notch behind; elytra rough; abdomen dark, with a rough violet spot on each segment. —Leach, Linn. Trans. xi. t. vii. f. 3, 4, 5; Brandt and Ratzb. ii. t. xvi. f. 7. *Proscarabæus violaceus*, Steph. Man. n. 2625.

Fig. 17.—*Meloe violaceus.*

Included by Brandt and Ratzeburg with the medicinal species.

VARIEGATED OIL BEETLE, *Meloe variegatus*, Don; somewhat brassy, tinted with purple-violet; head and thorax punctate; elytra with raised shining confluent points, interstices darker; abdomen with the dorsal segments anteriorly golden-green, and posteriorly violet-red copper, beneath variegated with purple and gold.—British Insects, ii. t. 67; Leach, Linn. Trans. xi. t. vi. f. 1, 2; Mart. Eng. Ent. t. 39. f. 1; Brandt and Ratzb. ii. t. xvi. f. 6. *Meloe maialis*, Schæff. Ic. t. 3. f. 6; Panz. t. 350. 2.

Fig. 18.—*Meloe variegatus.*

Length of male, 8 lines to $1\frac{1}{2}$ in.; female, 1 in. to 1 in. 9 lines.

Meadows. Europe; Great Britain.

One of the four species which Moquin-Tandon says are "more particularly made use of." It is the most showy of all of them.

This oil-beetle is found very frequently in spring, in our meadows and pastures, creeping slowly, and feeding on the leaves of the violet, anemone, hound's-tongue, and on the different species of *Ranunculus*. The insect, when touched, exudes an acrid fluid, of an oily consistence and of an orange colour, from each joint of its legs, which is a powerful rubefacient, and was formerly celebrated for its supposed efficacy in chronic rheumatism, applied to the parts in the form of an embrocation. It has been likewise recommended as a diuretic in dropsies, and on the Continent, particularly in Germany, as a remedy in hydrophobia. Frederick the Great, king of Prussia, purchased the nostrum from the discoverer for a valuable consideration, as a specific against this terrible malady. According to the Disp. Boruss. Brand., "Twenty-five beetles that have been preserved in honey are, with two drachms of powdered black ebony, one drachm of Virginia snake-root, one drachm of lead-filings and twenty grains of fungus sorbi, to be reduced to a very fine powder; the whole, with two drachms of theriaca of Venice (and, if necessary, with a little elder-root), are to be formed into an electuary."

Dr. Leach writes, "I am informed by Mr. Hunneman that this species is highly prized in Germany as a medicine, being considered a specific in hydrophobia. For this purpose, it is taken by slipping a hair round its neck, and suspending it until it be dry; by which means the oily secretion they throw out when first taken is preserved, in which its chief virtue is supposed to exist."

MAY OIL-BEETLE, *Meloe majalis*, Linn.; black, smooth, margin of the dorsal segments tawny; thorax quadrate, rectangular behind.—Linn. Sp. ed. 2, p. 679; Leach, Linn. Trans. xi. t. 6. f. 3, 4; Brandt and Ratzb. ii. t. 16. f. 11; Brandt and Erichs. Mon. t. 8. f. 8.

Fig. 19.—*Meloe majalis.*

Length of male 1 in. $3\frac{1}{2}$ lines; female, 1 in. $7\frac{1}{2}$ lines.

Inhabits France, Spain, Portugal and N. Africa.

This species does not shrink so much after death as the majority of its congeners, a peculiarity long since observed by Dr.

Leach. It is the fourth species included by Moquin-Tandon in his 'Medical Zoology.'

AUTUMNAL OIL-BEETLE, *Meloe autumnalis*, Oliv.; purplish or violet-black, sometimes brassy; head, thorax and elytra glabrous, with faint punctures, crowded on the elytra; abdomen smooth above, very much punctured beneath; antennæ dusky, tip pitchy.—Oliv. Ins. vi. 45. t. 1. f. 2. *Meloe glabratus*, Leach, Linn. Trans. xi. t. vii. f. 1, 2. *Proscarabæus autumnalis*, Steph. Man. 2629.

Fig. 20.—*Meloe autumnalis.*

Length of female from 5 to 7½ lines. Heaths. Europe; Great Britain.

This is one of the species which have been recommended for medicinal uses (Moq.-Tand. p. 137), although it is one of the smallest.

ROSSI'S OIL-BEETLE, *Meloe Tuccius*, Rossi; black; head and thorax deeply impresso-punctate; elytra variously punctate.—Rossi, Fauna Etrusc. i. p. 238. t. 4. f. 5; Brandt and Ratzb. ii. t. 16. f. 3. *Meloe punctatus*, Leach, Linn. Trans. xi. t. 18. f. 1.

Inhabits France, Portugal, Italy, etc.

This and *M. coriarius*, Hoffm., have been much confounded together under the name of *M. punctatus*. They are now generally regarded as distinct. This is included by Brandt and Ratzeburg amongst medicinal species.

ROUGH-BELLIED OIL-BEETLE, *Meloe coriarius*, Hoffm.; deep black; segments of the abdomen of a rusty reddish-brown beneath; thorax transverse, the foremost angles obtuse.—Brandt and Erichs. Mon. p. 131; Mulsant, Vesic. p. 62. *M. reticulatus*, Brandt and Ratzb. t. 16. f. 1, 2.

Inhabits Germany, Hungary, etc.

Body black, shining. Head black, rather shining, strongly and roughly punctate, the frontal channel more or less distinct; labrum finely punctate. Antennæ black, the basal joint with a violaceous, and the rest with a purplish tint. Thorax transverse, subtruncate in front, with the angles obtuse; base distinctly emarginate; margin elevated, plane above, deeply punctato-rugose, strongly channelled. Elytra rugoso-punctate, somewhat rounded, black. Abdomen rather shining above, very rugulose, beneath sparingly piloso-punctate, the second to the fifth segment with a large transverse rusty red patch in the middle. Feet black, sometimes with a violet tint.

This has been confounded with *M. Tuccius*, under the name of *M. punctatus*.

PANZER'S OIL-BEETLE, *Meloe brevicollis*, Panz., antennæ rather short; blue-black, somewhat shining; head and thorax sparsely but deeply punctate. Length of male, 7 lines, of female, 8½ lines.—Panz. Ent. i. p. 351, n. 6; Fauna Germ. x. f. 15; Leach, Linn. Trans. xi. t. 6. f. 9; Brandt and Ratzb. ii. t. 16. f. 8.

Inhabits Britain, Sweden, Germany, Portugal, etc. Brandt and Ratzeburg are our authorities also for the admission of this species into our list.

PORTUGUESE OIL-BEETLE, *Meloe corallifer*, Germ.; antennæ filiform, black, rugulose; thorax transversely quadrate, papillose angles blood-red.—Germ. Mag. iii. p. 259; Brandt and Ratzb. ii. t. 16. f. 9.

Inhabits Germany, Portugal, etc.

Head black, subopaque, deeply and closely but unequally punctate. Antennæ filiform, slender, twice the length of the head, the first two joints hairy, the others nearly smooth. Elytra black, subopaque, coriaceous, longitudinally rugulose. Abdomen smooth and opaque above, somewhat shining, and slightly hairy beneath. It has been sometimes employed in Portugal.

HUNGARIAN OIL-BEETLE, *Meloe limbatus*, Fabr.; black; thorax plane; elytra with the margin ferruginous.—Fabr. Eleuth. ii. p. 588; Germ. Ins. x. t. 8; Brandt and Ratzb. t. 16. f. 10. *Meloe hungarus*, Schr. Ins. Austr. 226, 425.

Inhabits Hungary.

ZIEGLER'S OIL-BEETLE, *Meloe cicatricosus*, Leach; black; elytra bluish; head and thorax punctate; elytra scabrous; length of male, 1 in., female, 1 in. 7 lines.—Linn. Trans. xi. t. vi. f. 5, 6; Newport, Linn. Trans. xx. xxi. t. 20. *Meloe reticulatus*, Ziegler.

Inhabits Germany, France, England and Spain.

This species has been recommended on the Continent.

(*To be continued.*)

Chapters for Students.

CHEMICAL NOTES TO THE PHARMACOPŒIA.

BY WILLIAM A. TILDEN, D.SC. LOND.
DEMONSTRATOR OF PRACTICAL CHEMISTRY TO THE PHARMACEUTICAL SOCIETY.

SAPO MOLLIS.—[§ Soap made with olive oil and potash.]

When potash is employed to saponify oil or fat, the resulting soap cannot be separated from solution by the addition of common salt, for decomposition ensues, and a hard soda-soap is precipitated. Ordinary soft soap therefore contains all the glycerine and excess of alkali which is necessarily employed.

SODA CAUSTICA.—Solid caustic soda is obtained, according to official directions, by evaporating down the liquor. Its solution in water should give the same reactions as good liquor sodæ. Most of the common caustic soda of commerce is obtained as a secondary product in the manufacture of soda crystals. [See SODÆ CARBONAS.] It contains considerable quantities of carbonate of sodium, and is contaminated with much iron and alumina, as well as sulphates, chlorides and other impurities. Very pure sodic hydrate, prepared by decomposing water by the metal, is now to be obtained at a very moderate price. The sodium, in acting upon water, of course displaces half its hydrogen, which escapes.

$$Na_2 + 2H_2O = H_2 + 2NaHO.$$

If care is taken to keep the water cold, the hydrogen does not inflame, and explosions may be avoided.

Caustic soda obtained by evaporating down the resulting solution is free from alumina, ammonia and nitrates, but traces of lead are to be found in some samples.

SODA TARTARATA, $NaKC_4H_4O_6 4H_2O$.—Rochelle salt is easily prepared by adding cream of tartar to a hot solution of carbonate of sodium till the liquid is neutral, and crystallizing.

It forms right rhombic prisms, which are almost always halved. [See fig. in Phillip's Transl. of the Pharm. Lond.] Tests for identifying the salt are given in the Pharmacopœia. It should be entirely soluble in cold water, showing freedom from calcium salts.

[§ 14·1 grams heated to redness till gases cease to be evolved, leave an alkaline residue, which requires for neutralization 100 cubic centimetres of the volumetric solution of oxalic acid.]

$KNaC_4H_4O_64H_2O$ represents a molecule of the salt weighing 282; on ignition it gives a molecule of sodic potassic carbonate, $KNaCO_3$, weighing 122. A twentieth of that quantity, 14·1, taken in grams, would therefore leave 6·1 grams of the alkaline carbonate, a quantity which exactly neutralizes 100 cubic centimetres of the standard solution of oxalic acid.

SODÆ ACETAS, $NaCH_3O_2 3H_2O$.—A salt prepared by neutralizing pyroligneous acid with carbonate of sodium, and purified by heating the dry salt and subsequently recrystallizing.

SODÆ ARSENIAS, Na_2HAsO_4, $7H_2O$.— [See ACIDUM ARSENIOSUM.]

SODÆ BICARBONAS, $NaHCO_3$.—This compound is manufactured in large quantity by exposing soda crystals to the action of carbonic acid gas. As the bicarbonate is formed, the water of crystallization drains away, saturated with carbonate of sodium, and the white pulverulent substance which finally remains has only to be rinsed with a little pure water and dried. The Pharmacopœia employs a mixture of carbonate and dried carbonate of sodium, in order that the salt may not become too wet on exposure to the action of the gas.

$$Na_2CO_3 + H_2O + CO_2 = NaHCO_3 + NaHCO_3.$$

[§ A solution of the salt in cold water gives a white, and not a coloured precipitate, (mercuric oxichloride), with solution of perchloride of mercury.] This test is intended to show the absence of the disodic carbonate, but is somewhat uncertain in its action.

SODÆ CARBONAS, $Na_2CO_3 . 10H_2O$. — [§ Obtained from the ashes of marine plants, or produced by chemical decomposition from chloride of sodium.]

The whole of the "soda" used in this country is from the latter source. The salt is mixed in muffle-like furnaces, with an equivalent of sulphuric acid, and the hydrochloric acid, which is expelled by a gradually increased temperature, is condensed by passing it through water. The decomposition which occurs, may be represented as passing through two stages:—

$$\text{I. } NaCl + NaCl + H_2SO_4 = NaCl + HCl + NaHSO_4.$$
$$\text{II. } NaCl + NaHSO_4 = HCl + Na_2SO_4.$$

The sulphate of sodium which is thus obtained, and is called salt-cake, is next mixed with small coal and carbonate of calcium, and roasted till inflammable gases ceases to be evolved. By this operation the sulphate is deoxidized by the combustible matters of the coal, and the sulphide of sodium which is formed effects a double decomposition with the carbonate of calcium:—

$$Na_2SO_4 + C_4 + CaCO_3 = CaS + 4CO + Na_2CO_3.$$

A certain amount of the carbonate of calcium is simultaneously converted into oxide by loss of CO_2, so that, on lixiviating the "black ash" with tepid water, the resulting solution contains not only carbonate, but hydrate of sodium. The sulphide of calcium is left in the insoluble residue.

To obtain crystals the liquor is evaporated down, and the salt which separates, calcined and recrystallized. The caustic soda is recovered by evaporating the crude liquor from black ash till the crystallizable salts are all deposited, then continuing the evaporation with addition of a small quantity of nitrate of sodium, which destroys the cyanides and sulphides present. The concentrated liquor is then run into sheet-iron casks, where it solidifies. Carbonate of soda of commerce is generally called simply "soda;" it occurs in large efflorescent, strongly alkaline crystals. [§ By heat it undergoes aqueous fusion, and then dries up, losing sixty-three per cent. of its weight.] The residual dry salt constitutes SODÆ CARBONAS EXSICCATA, B. P. Dry carbonate of sodium for analytical purposes is obtained in a purer state by heating the bicarbonate.

SODÆ CITRO-TARTRAS EFFERVESCENS.—A mixture of bicarbonate of soda and tartaric and citric acids when subjected to a gentle heat readily aggregates from the liquefaction of the acids. A certain variable amount of CO_2 is then expelled, but the greater part of the carbonate remains undecomposed, the reaction being completed only when the preparation is dissolved in water.

(To be continued.)

THE SO-CALLED AFRICAN SAFFRON.

BY PROFESSOR JOHN M. MAISCH.

Nearly a year ago, my friend A. E. Ebert sent me a sample of what had been offered in Chicago under the name of African saffron, and was in the hands of an agent of a New York house. I also procured from Breithaupt and Wilson, New York, a sample under the same name, and found the Chicago and New York so-called African saffron alike, namely, to be the florets of *Carthamus tinctorius*, Cir., the well-known safflower or dyers' saffron, but more broken than what we usually see under this name and that of American saffron; it is likewise more discoloured. This plant is originally indigenous to the East Indies, but is very extensively cultivated in Western Asia, Southern Europe, and Northern Africa, particularly Egypt. Whether this so-called African saffron was really imported from Africa or not, I have no means to ascertain; but it is not improbable that, with the staple drugs regularly shipped from Alexandria, Egypt, this lot of *Carthamus* may have likewise been exported in consequence of the failing supply from Europe and other places.

Through the kindness of Messrs. M'Kesson and Robbins, New York, I obtained three samples of so-called African saffron, two of which likewise proved to be *Carthamus;* one of these samples was on hand in New York, and offered at $3.50 per pound; the other, the better quality as far as could be judged from the small samples, was, previous to its arrival, offered at 75 cents per pound.

The third of these samples, representing thirty pounds, held in London, England, and for which offers were solicited, was *not Carthamus;* it consists of the corollas of a plant probably belonging to the Natural Order *Scrophulariaceæ*, which in their dried condition are of a dirty greenish-brown colour; they are about one inch long, the tube being about one-tenth inch in diameter, and three-quarter inch in length, inflated in the throat and smooth, the limb somewhat bilabiate, one sterile stamen, with the filament nearly free, the fertile stamens didynamous. Infused in cold water, they impart an intense yellow colour to it. The total absence of calyx, ovary, and even style, renders it impossible to express an opinion as to the genus from which this so-called saffron may have been derived. It is unquestionably a new claimant for public favour as a dye-stuff, its unsightly appearance probably interfering with its successful introduction. It is too dark coloured and too coarse in its structure to be used as a sophistication of, or substitution for true saffron.

As far as my experience extends, the article which last winter (1870–71) was in the American market under the name of African saffron, was *Carthamus*, while about the same time a small lot of (probably) scrophulariaceous flowers were offered in the London market under the same name.—*American Journal of Pharmacy.*

THE CLARIFICATION OF SYRUPS BY PAPER PULP.*

BY M. MAGNES-LAHENS.

The method proposed by M. Desmarest, and mentioned in the French Codex, of using finely-divided unsized paper and a woollen strainer for the clarification of syrups, has not met with much acceptance among pharmaceutists. This result, the author thinks, arises partly from the absence of any detailed description of the process, and partly from the difficulties which, at first sight, appear to endanger its successful accomplishment. With the object of completing the description already given, by indicating the points of detail to be attended to in order to attain a satisfactory result, the author has made many experiments, leading him to the opinion that when the numerous advantages of this process are better known, it will be recognized to be one of great value to the pharmaceutist. The object to be attained in effecting clarification by this method is the uniform deposition of the paper pulp, previously diffused through the syrup, upon the sides of the filter, forming a kind of felting through which the syrup is passed. The conditions under which this is best accomplished, the author considers to be as follows:—

First, as to the paper. This should be unsized, white, and of good quality. It should be reduced to a paste by shaking it vigorously in a bottle with a part of the vehicle which forms the base of the syrup.

The filter is best made of the material called swansdown, and in shape like an inverted sugar-loaf. Its capacity should be about one-third of the syrup intended to be strained; for instance, a filter of one litre is suitable for three litres of syrup. The quantity of paper required for the felting of a filter of this size is three grams; it will be seen, therefore, that a litre of syrup requires a gram of paper for its clarification.

The temperature at which the syrup is best suited for clarification the author considers to be from 35° C. to 40° C. (95° F. to 104° F.) When cold the syrup runs too slowly; besides the difficulty met with in dissolving the quantity of sugar in the proportion of vehicle sometimes ordered. When raised to a higher temperature, especially if it approach 100° C., the syrup passes through too rapidly, and the felting does not act uniformly and well.

These conditions being complied with, the operation may be commenced by pouring the syrup, through which the paper pulp has been previously well diffused, rapidly into the filter, in such a manner as to fill it as soon as possible, and then to keep it constantly full until there is no more syrup to pour in. When the greater part of the syrup has passed through, and but little remains in the filter, the felting caused by the deposition of the small particles of paper on the inside of the filter from the syrup in passing through will have been effected. The syrup is then passed through a second time, still keeping the filter full as before, and if the operation be carefully carried out, the result will leave nothing to be desired. In pouring the syrup into the filter, the stream should be directed towards the centre, and not on the sides, to avoid disturbing the felting.

The author next discusses the advantages of this method compared with clarification by albumen or by filtering through paper. He states that where simple syrup is clarified by white of egg, a part of the albumen and the whole of the soda is retained in the syrup, and he is of opinion that the albumen, being very unstable in its nature, may sometimes be prejudicial to the preservation of the syrup, while the soda, although present in a very minute proportion, can exercise an injurious influence on some of the chemical compounds contained in medicines where the simple syrup is used. This result is avoided in the paper-paste process, and the product is found to have a clearer and more agreeable flavour. With the same quality of sugar the syrup clarified by albumen is more coloured than that for which paper paste is used; the process too requires more time and care, is more expensive, and in consequence of the abundant scum, the waste is greater. Another point claimed is that, as it is not necessary by the paper-pulp process to raise the temperature beyond 40° C., there is no difficulty in maintaining the proper consistence of the syrup.

So satisfactory has the author found this method that he has adopted it for some time in his pharmacy to the exclusion of the others; preparing by it a syrup which he uses for sweetening medicines, and as a basis for the medicated syrups. His formula is as follows:—

Powdered loaf sugar	20,000 grams.
Water	10,500 „
White filter-paper	24 „

The sugar on being placed in a deep, wide pan, the water, in which the paper has previously been divided, is added. The pan is then placed on a stove and heated, stirring all the while, until the syrup has attained a temperature of from 35° C. to 40° C. (95° F. to 104° F.) and the sugar is thoroughly dissolved. It is then poured into a filter of eight or nine litres capacity, and the operation carried out as before described. The product obtained is of great clearness, the density being 35 Beaumé (sp. gr. 1·321). After the syrup ceases to run, the filter will still retain about 500 grams. By washing it with a little lukewarm water, pressing it strongly, bringing the liquor to a syrupy consistence, then adding a little paper and again filtering through a small filter, the greater part of this may be recovered.

Among the numerous syrups of the French Codex, there are a few which are ordered to be filtered through paper filters. The author states that an equally satisfactory product may be obtained by Desmarest's process, while the time occupied is considerably less. One litre of syrup, sp. gr. 1·321, filtered through a large paper filter under the most favourable conditions would require at least sixteen hours, while the same quantity might be clarified in two hours with a swansdown filter and a proper proportion of paper pulp. Finally, with regard to medicated syrups, M. Magnes-Lahens refers to the objection he has before indicated to the use of albumen for clarification, and points out the danger of the principles to which such syrups owe their medicinal properties undergoing change at the temperature necessary for coagulation. Besides this, he states that he has found that a variable proportion (in syrup of lactucarium as much as one-seventh of the whole) of the active principle is taken up by the albumen in coagulation, and therefore entirely lost. He expresses a hope that no pharmaceutist will be led to neglect this process on account of the difficulties that, apparently, it offers, as he is sure that all these difficulties will vanish at the first attempt, if care be taken in following the directions given. The process may also be used in the filtration of oxymels, etc.

* Journal de Pharmacie et de Chimie [4], vol. xv. p. 140.

THE PHARMACY OF THE BIBLE

BY J. T. SLUGG, F.R.A.S.

(*Concluded from page 805.*)

Cassia and *Cinnamon* are no doubt the barks of the trees known by those names at the present day. Cinnamon is mentioned, as we have seen, by Moses, which is of importance as throwing considerable light on the fact that even in the earliest times the products of one country found their way by means of foreign trade into distant lands. Cinnamon was not grown nearer to Egypt than India and Ceylon, and the question arises how this product of the far East found its way thus early into the neighbourhood of the Mediterranean? Dr. Kitto thought that this was effected by the Arabians.

Calamus is generally supposed to be the *Calamus aromaticus*, or sweet flag; but this is denied by some scholars, who refer it to the lemon-grass of India and Arabia.

Camphire is an incorrect rendering of the word *côpher* In both the places of its mention, the marginal reading is "cypress." The substance really denoted is the *henna* plant, or *Lawsonia alba*. It was used as a dye for the nails, giving them a deep yellow or orange tinge, which was greatly admired.

Frankincense.—The epithet frank or free was applied incense because of the freeness with which it gives out its odours and burns. It is not the article known as gum *thus*, but that known as olibanum, a gum produced by a tree known as *Boswellia serrata*, or *B. thurifera*. It was imported, we learn from Jeremiah, from Arabia.

Lign Aloe is the eaglewood of India, and has no connection with the drug known as aloes, the name being a corruption of the Arabic *allowat*. Of all perfumes, this was most highly prized by Eastern nations; the Jews believed it grew in the garden of Eden.

Myrrh is mentioned in our English Bibles as a part of the present sent by Jacob to Joseph, and also as one of the spices which the Ishmaelite merchants were carrying into Egypt. The original word here is *Lôt;* whereas the word which is rendered "myrrh" in every other part of scripture is *môr*. The article called lôt was not myrrh, but most probably gum labdanum, inasmuch as myrrh was not produced in Palestine, as the passages in Genesis speak of it as being exported from Gilead into Egypt. It was among the gifts brought by the wise men to the infant Jesus, and was highly valued by the Jews and other ancient nations. We are told that before Esther was presented to the king, "she was purified six months with oil of myrrh, and six months with sweet odours."

According to St. Mark, just before our Saviour's crucifixion, the soldiers offered a draught of "wine mingled with myrrh." It is difficult to understand this passage. Commentators agree in assigning as the reason that it was intended as a "pain-killer, presented out of pity." But myrrh is not an anodyne. The other evangelists speak of the draught as "vinegar mingled with gall." As *gall* stands associated in other places with that which is poisonous, the probability is that the draught contained some bitter and anodyne herb; it may have been the poppy, intended to stupefy the sufferer.

Saffron, there is no doubt, is the correct rendering of the Hebrew word. From the earliest times it has been in high repute as a perfume. It was used, we are informed, for the same purpose as modern "pot pourri."

Spikenard.—We read that "Mary took a pound of ointment of spikenard, very costly, and anointed the feet of Jesus." One of the disciples was displeased with so lavish an expenditure, asking, "Why was not this ointment sold for 300 pence and given to the poor?" It appears from this that its value was £9. 7*s*. 6*d*. There is much difference of opinion as to what really the plant was which is rendered "spikenard." Sir William Jones, one of the most learned Oriental scholars, said of this famous perfume, "I am not of opinion that the nardum of the Romans was merely the essential oil of the plant, but am strongly inclined to believe that it was a generic word, meaning what we now call attar or otto of some plant; or the mixed perfume called "abir," of which the principal ingredients were yellow sandal, violets, orange flowers, wood of aloes, rose, musk, and true spikenard." The true spikenard, the "nardus indica" was highly esteemed as a perfume and as a stimulant medicine.

By *Aloes* we are, of course, not to understand the medical drug of that name, but either the Lign aloes or, what is quite probable, some kind of odoriferous cedar.

Aniseed is mentioned in connection with *mint* and *cummin*, which are represented as three of the smallest and most insignificant plants. No doubt mint and cummin are rightly translated, but the word translated *anise* Dr. Royle thinks should be called *dill*, as the anethum is more especially a genus of Eastern cultivation than the other plant. There is also an allusion to cummin in Isaiah, where the mode of separating the seeds from the plant is mentioned as being accomplished, not with a cart wheel turned on them, but by being beaten with a rod. Which of the *mints* is referred to I am unable to say. The ancient Greeks employed a herb which they called *menthos*, also termed "eduosmon," or the sweet-smelling herb. This is thought to be the "pipertia."

The *Almond*-tree, being a native of Asia, was well known to the Jews. "Lûz," translated *hazel* in Genesis, was another word for almond, and should have been so rendered.

Sulphuret of Antimony was known in most ancient times as a black pigment, and was used by both Greek and Asiatic ladies as a paint for their eyebrows. Mr. Rimmel, in his admirable 'Book of Perfumes,' says, "Jewish women were mostly adorned with great physical beauty. Not content, however, with their natural personal attractions, they tried to enhance them with various cosmetiques." They were addicted to the practice of "painting" quite as much as the ladies of our own day. We are told that when Jezebel expected Jehu "she painted her face." Mr. Rimmel and Pereira both think it was her eyes to which she gave that dark hue, which was thought so fascinating. Ezekiel refers more directly to this practice in the words, "Thou didst wash thyself, paintedst thine eyes, and deckedst thyself with ornaments." Pereira informs us it was the sulphuret of antimony which was thus used.

Balm of Gilead was supposed to have a medicinal virtue, to which there is direct reference in the question asked by the prophet Jeremiah, "Is there no balm in Gilead? Is there no physician there? Why, then, is not the health of the daughter of my people healed?" In another place it is said, "Take balm for her pain; if so be, she may be healed." And again, "Go into Gilead, and take balm; in vain shalt thou use many medicines, for thou shalt not be cured." It was an article of commerce at a very early period; for we read that the company of Ishmaelites to whom Joseph was sold by his brethren came from Gilead with their camels, bearing spicery and balm and myrrh, to carry it down to Egypt." We learn the value placed upon it from the fact that when Jacob sent his sons the second time to the ruler of Egypt, desiring to propitiate him, he bid them "take a present, a little balm, a little honey," etc. Pliny says, "To all other odours whatever, the balsam is preferred." It was esteemed so precious a rarity that both Pompey and Titus carried a specimen to Rome in triumph. "A small piece of the resin," says Theophrastus, "was so odoriferous, that it filled a large space with its perfume." He adds, that in his time only two enclosures of small extent were known to produce this tree. It was obtained from the *Balsamodendron Gileadense*, or *opobalsamum*. Pereira says it is a whitish, turbid, thick, very odorous liquid, which resinifies and becomes yellow by keeping. Its physiological effects are believed to be similar to balsam copaiba and the liquid turpentines. The most wonderful properties were formerly ascribed to it. It is rarely employed by Europeans, but it is adapted to the same cases as the terebinthinates.

By *Brimstone*, no doubt is intended the substance known to us under the same name.

Bdellium is named in the Bible as early as the second chapter of Genesis, where it is associated with gold and onyx stone as one of the productions of the land of Havilah. In Numbers, the colour of manna is likened to *bdellium*; but it is very doubtful if the word translated *bdellium* be a mineral or animal production, or a vegetable exudation. There is a kind of myrrh, the product of the *Amyris commifera*, known as Indian *bdellium*, which is very odoriferous, diffusing a grateful fragrance to a considerable distance. Whether this be the same article or not is uncertain.

Coriander seeds are, no doubt, the same as now pass under that name. They are only mentioned twice in the Bible.

The *Colocynth* plant is referred to, though not by its name, but is called the "wild vine." In the Book of Kings we are told that some of this plant was gathered and used by mistake as a potherb, being shred into a pot of pottage of which the sons of the prophets partook.

Figs.—The trees bearing this fruit are very common in Palestine. There are many interesting references to them in Scripture.

Garlick is mentioned once in Numbers, in connection with fish, cucumbers, leeks, melons and onions, as the food of the Israelites in Egypt, after which they longed when feeding on manna in the desert.

Gall, Hemlock and Wormwood.—There is occasional reference to wormwood in the Bible, which is always metaphorical as indicating that which is bitter, and, in this sense, it is sometimes associated with *gall*; as, for instance, "lest there should be among you a root that beareth wormwood and gall." *Hemlock* occurs twice in the Old Testament, but the Hebrew *rôsh*, which in these two places is rendered hemlock, is elsewhere translated "gall," denoting anything bitter. Whether hemlock is the best rendering of *rôsh* is doubtful. The Hebrew word means *head*; and it is more probable that, as Gesenius supposes, the capsules of the poppy are intended.

The *Galbannum* of the Bible, Bishop Patrick tells us, must not be confounded with the common galbanum used in medicine, but that it was a superior sort found on Mount Amonus, in Syria.

Honey is another article of pharmacy often mentioned in Scripture. It abounded in Palestine. The word translated *honey* also applies to a decoction of the juice of the grape, which forms an article of commerce in the East. It was this, and not bee-honey, that Jacob sent to Joseph. A third kind of honey has been described by some writers as vegetable-honey, by which is meant the exudations of certain trees. There is a fourth kind, mentioned by Josephus, produced from the juice of the date.

Hyssop.—Perhaps no plant mentioned in the Bible has given rise to greater difference of opinion than this. Bochart thinks that marjoram, or some plant like it, is indicated. Dr. Royle arrived at the conclusion that it is no other than the caper plant.

Lime and the mode of obtaining it by burning the carbonate were known in the most remote periods of antiquity. It was used by Hippocrates in medicine. It is mentioned only three times in the Bible, in one instance being translated plaister, showing it was used then as now, for cementing stones, etc. There is a still more curious reference to it in Amos, where we read, "Because he burned the bones of the Kings of Edom into lime." This expression indicates a knowledge of chemistry as to the constitution of bones 800 years B.C.

By *Mallow*, no doubt is meant "purslane," which was used as a potherb.

The *Manna* of the Bible is certainly not the same as the manna of our shops, and has no relation to it.

Millet is probably a correct translation; and by it is meant the *Sorghum vulgare*, used in the time of Ezekiel, and at the present day in many countries of Europe, for making an inferior bread.

Mustard Seed.—The tree named in the New Testament has been the subject of much dispute. Great difficulty has been experienced in fixing on a tree on whose "branches the birds can lodge." The *Salvadora persica*, however, answers this description.

Natron and *Soap.*—The word "*nether*" translated *nitre*, undoubtedly means *natron*. The substance denoted cannot be our *nitrate of potash*. In Proverbs the incongruity of singing songs to a heavy heart is compared with the reaction which takes place when vinegar is applied to natron. In Jeremiah we have the same word again wrongly translated, "Though thou wash thee with nitre and take thee much *sope*," etc.; evidently natron is intended. The word *bôrith*, translated "soap," is a general term for any substance of cleansing qualities. We may understand the natron to represent a mineral alkali, and soap a vegetable one, probably some kind of potash. Numerous plants, capable of yielding alkali, exist in Palestine and the surrounding district.

Olive Oil.—This is one of the oldest drugs known. Jacob consecrated the stone pillar which he set up by pouring oil on its top. It was produced in large quantities in Palestine, and was exported thence into Egypt and other countries,—King Solomon giving 170,000 gallons yearly to the Tyrian hewers of wood. It was used in religious services, in making perfumed ointments, as an article of food and medicinally. Celsus frequently speaks of the use of oil, especially old oil, applied externally, with friction, in fevers, and in other cases. Josephus tells us that amongst the remedies employed in the case of Herod, who "was eaten up of worms," he was put into a bath of olive oil.

Onycha has been supposed by some to have been the gum of a tree. It is now, however, generally believed that it was the shell of a species of mussel, found on the shores of the Red Sea, which, when burnt, emits a smell not unlike that of musk.

Palm.—Although this tree was so well known by the Jews, and its products are so numerous, excepting its syrup called honey, there is no clear allusion to any of them in the Bible.

The word *Pomegranate* is derived from "*pomum granatum*," "grained apple," The beauty of its flowers has furnished Solomon with several allusions. The estimation in which it was held by the Israelites may be inferred from its being specified as one of the luxuries they enjoyed in Egypt It was one of the three kinds of fruit brought by the spies from Eschol.

Ricinus, the castor oil plant, was known in very early times. Some of its seeds have been found in Egyptian sarcophagi supposed to have been 4000 years old. This is the plant which, in the book of Jonah, our translators have rendered *gourd*, and which we are told "was prepared by the Lord to come up over Jonah, that it might be a shadow over his head."

Sponge is only mentioned in the New Testament—in connection with the crucifixion. The commercial value of it was known, however, from the earliest times.

The word *Stacte* signifies an odorous distillation from some plant. It was most probably the gum of the storax-tree.

Vermilion is mentioned twice in the Old Testament. The original word means simply "redness," and may refer to any kind of red paint. Cinnabar, however, has been found in the colouring-matter of the old Egyptian tombs.

Vinegar is mentioned by Moses 1490 years B.C. By this term is sometimes meant the common sour wine of the country,—the ordinary beverage of the people; at others it indicates a liquid made from grapes, which had undergone the acetous fermentation.

Wax.—Honey having been so abundant in Judea, we naturally conclude wax also would be known. There are a few allusions to it in the Old Testament showing its properties to have been well understood. The psalmist speaks of his heart as being "melted like wax.

THE CHICAGO COLLEGE FUND.

The following is a list of the subscriptions promised up to April 12th, 1872.

Amount previously acknowledged, £442. 6s. 0d.

	£.	s.	d.
Robert Gatenby, student, 17, Bloomsbury Square, London	0	10	6
John Moss, 17, Bloomsbury Square, London	0	10	6
J. H. Soole, Grays, Essex	0	5	0

CHEMISTS AND DRUGGISTS OF GLASGOW.

By Mr. Thomas Davison.

Frazer and Green, 113, Buchanan Street	2	2	0
Glasgow Apothecaries' Co., Virginia Street	1	1	0
" " St. Vincent Street Branch	0	10	6
" " Sauchiehall Street Branch	0	10	6
Murdoch Brothers, Sauchiehall Street	0	10	6
J. M. Fairlie, South Portland Street	0	10	6
Alexander Kinninmont, Buchanan Street	0	10	6
John Jaap, Buchanan Street	0	10	6
J. A. C.	0	2	6

ERRATA.

In the list of January 25th, 1872, *for* "William Famworth," *read* "William Farnworth;" and in that of March 9th, 1872, *for* "George Deloes, Exeter," *read* "George Delves, Exeter."

March 9th, 1872. The numerous subscriptions from Manchester were collected under the superintendence of Mr. F. Baden Benger; those from Exeter by Mr. Ralph Walton.

The following is a list of the books, etc., promised up to March 6th, 1872, in addition to those previously acknowledged.

Longmans, Green and Co., Paternoster Row, London.

Watts's Dictionary of Chemistry, 5 vols. Dictionary of Science and Art, by Brande and Cox, 3 vols. Millar's Elements of Chemistry, 3 vols. Dr. Ure's Dictionary of Arts, Manufactures and Mines, edited by Robert Hunt, 3 vols. A Practical Treatise on Metallurgy, by Crookes and Röhrig, Vol. I. Lead, Silver, Zinc, etc.; Vol II. Copper, Iron; Vol. III. Steel, Fuel, Supplement. Crookes's Select Methods in Chemical Analysis, Chiefly Inorganic. Tyndall On Sound, a course of eight lectures delivered at the Royal Institution of Great Britain. Miller's Introduction to the Study of Inorganic Chemistry. Dr. Wood's Chemical Notes for the Lecture Room. Dr. Wood's Notes on Metals. Bloxam on the Properties and Treatment of Metals. Odling's Outlines of Chemistry, or Brief Notes of Chemical Facts. Odling's Manual of Chemistry, Part I. Odling's Animal Chemistry. Odling On Carbon. Odling's Practical Chemistry. Tyndall On Heat as a Mode of Motion. Ganot's Physics, translated by Dr. Atkinson.

Ferdinand Coles, F.C.S., 248, King's Road, Chelsea.

Parkes's Chemical Catechism. Lindley's British Flora. Harris's Rudimentary Electricity. Translation of the London Pharmacopœia. Buckmaster's Experimental Physics. Parkinson's Chemical Pocket Book.

G. J. Owles, Halesworth.

Solly's Chemistry. Fresenius's Analysis. Pritchard's Infusoria. Griffin On the Blowpipe. British Pharmacopœia. On Gold—for the Emigrant, by Lecturers at the Royal School of Mines. Napier's Dyeing. Patterson's Zoology. Taylor's Guide to Science.

George R. Durrant, Old Cross, Hertford.

Garrod's Essentials of Materia Medica and Therapeutics, 2nd edit. Day's Chemistry in Relation to Physiology and Medicine.

W. C. Hayland, 21, High Ousegate, York.

The Chemist and Druggist, 1862, 1863, 1864, 1865. Abel and Bloxam's Handbook of Chemistry. British Pharmacopœia. Darby's Wittstein's Chemistry. Year Book of Pharmacy, Wood and Sharp, 1866.

S. Atkinson, Biarritz.

The Dispenser's Vade Mecum, by J. Britten.

Dr. Wm. Frazer.

Elements of Materia Medica. Treatment of Skin Diseases.

C. R. C. Tichborne, Dublin.

Set of Tubes illustrating the Dissociation of Salts under Pressure. Set of Mounted Microscopic Objects, illustrating the Different Starches. Samples of Xylol.

Evans, Lescher and Evans, London.

A number of Specimens illustrative of the Materia Medica of the United States' Pharmacopœia.

F. Hall, M.R.C.S.E., 1, Jermyn Street, London.

Richardson's Geology. Matter and Motion, or the Origine and Qualities of Forms: date unknown. Brewster's Optics. Mantell's Invisible World. The Universall Medicine, or the Virtues of the Magneticall or Antimoniall Cup; by John Evans, Minister and Preacher of God's Word: printed by Richard Hodgkinsonne, in Thame Street, neer Addle-hill, where you may receive information how to come by the fore-mentioned cups, 1642, 1651. Turner's Chemistry, edited by Liebig, 6th edit. Pomet's History of Drugg's, illustrated with above four hundred copper cutts, and the way to know the true from the false: 1712.

Augustus Bird, Wood Lane, Shepherd's Bush, W.

The Life of the Hon. Henry Cavendish, Discoverer of the Composition of Water.

George Barber, 51, Great George Street, Liverpool.

The Pharmaceutical or Medico-Botanical Map of the World. Barber's Series of Pharmaceutical Labels for Bottles and Drawers. Wurtz's History of Chemical Theory, translated by Watts.

A Contribution from Paris.

By Dr. J. Léon Soubeiran.

Dalecampii,—Historia Generalis Plantarum, 2 vols. Pomet,—Histoire des Drogues, deux tomes. Nouveau Dictionnaire d'Histoire Naturelle, trente-six tomes. Formulaire Officinal et Magistral International. Science et Nature. Lettres sur la Physiologie. Notice sur l'Emulsion de Coaltar Saponiné. Remak,—Courant Constant au Traitement de Nervoses. Notes sur les Engrais Chimiques. Gariel,—De l'Audition. Deleschamp,—Sons de la Parole. Lefort,—Chimie Hydrologique; Chimie des Couleurs. Petrequin,—Lactates Alcalins. Du Saulle,—Les Eaux Minerales de Contrexeville. Essai sur les Falsifications du Sel de Cuisine. Riche,—Des Alcalis Organiques Volatils. Un Manuscrit de Guyton de Morreau,—Sur la Chimie Theoretique, 1780 (?). Henry,—Nickel dans Quelques Eaux Ferrugineuses. Barbier,—Distilleries Agricoles. Ebelmen,—Décomposition des Silicates. Corte,—De l'Expérience en Physiologie. Frignet,—Constitution Géologique de la Californie. Duges,—Sur la Faune de Guanajuato. Grassi,—De la Ventilation des Navires. Logerais,—Eaux Minérales de Pongues. L'Autier,—Sur les Fermentations. Thenot,—De la Cellule Végétale. Veines de Fer. Sur le Volume des Atoms. Sur les moyens de rendre l'Eau de Mer potable. Lithologia Meteorica. Damom,—Note sur un Hydrate d'Alumine Ferrugineuse. Figuier,—Sur le Chlorure d'Or et de Sodium. Sur la Decomposition des Roches. Gerdy,—Science. Van Peet,—Le Chloral. Bobœuf,—De l'Acide Phénique. Sur les Alliages de Cuivre et de Zinc. Jutier et Lefort,—Études sur les Eaux Minérales et Thermales de Plombières. La Production Animale et Végétale. Les Planted, Poëme par Castel. Collection de Mémoires sur la Pharmacie et Chimie de M. Jules Lefort. Twenty-four Théses on various subjects connected with Science, by gentlemen proceeding to graduate at the École de Pharmacie. A Collection of Memoirs (18) on Chemistry and on Pharmacy, by various authors. A Collection of Memoirs (60) on Botany, Natural History, Piscieulture, etc., by Dr. J. Léon Soubeiran. Les Travaux de Chimie de Milon. Otto sur la Recherche des Poisons. Collection of Memoirs (9) on Chemistry and Pharmacy, by Doctor C. Méhu.

H. B. Brady, F.L.S., Mosley Street, Newcastle-on-Tyne.

Seventeen numbers of the Pharmacist.

Professor Redwood, 17, Bloomsbury Square, London.

Pereira's Materia Medica, abridged. Edited by Bentley and Redwood.

NOTICE.

On behalf of the Committee Professor Attfield begs to announce that the list of contributors to the Chicago College Fund will be closed on the 30th of April. The cash already received is £450, and the value of the books and specimens presented at least £100; total £550. After all expenses of printing, postage and freightage are paid, the sum of Five Hundred Guineas will represent the response of British chemists and druggists to the appeal from their brethren of Chicago for aid in replacing the £2,000 worth of books, specimens, apparatus and furniture destroyed with the College by the great fire of October 8th and 9th, 1871. This is irrespective of subscriptions to the public fund for the general benefit of Chicago, a movement in which English pharmacists gladly and fully shared. A list of all the useful English books on pharmacy, chemistry, materia medica, and botany, has been compiled by help of the catalogues of large libraries and those issued by publishers; these and other volumes of the total value of about Two Hundred and Fifty Guineas will at once be transmitted to Chicago. The remaining Two Hundred and Fifty Guineas will probably for the most part be expended in apparatus and specimens for the illustration of lectures; but the wishes of the Council of the College, and the nature of the recent presents to, and purchases for, the Institution will necessarily guide the Committee of the Fund in completing their stewardship.

The Pharmaceutical Journal.

SATURDAY, APRIL 13, 1872.

Communications for this Journal, and books for review, etc., should be addressed to the Editor, 17, *Bloomsbury Square.*
Instructions from Members and Associates respecting the transmission of the Journal should be sent to Elias Bremridge, *Secretary,* 17, *Bloomsbury Square, W.C.*
Advertisements to Messrs. Churchill, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE SALE OF POISONS AND ITS DIFFICULTIES.

Among the difficulties that may be experienced by the duly qualified chemist and druggist in the ordinary exercise of his business, few are more perplexing than those arising from the popular use of certain preparations which, as regards adults, cannot reasonably be comprised under the legal definition of the term "poisons." Thus, for instance, even the supporters and advocates of compulsory regulations as to the sale of poisons do not hesitate to admit the propriety of selling such preparations as paregoric and some other of the mild opiates, without the poison label, which is, by law, necessarily used in the sale of a more powerful preparation of opium, such as laudanum.

However, the circumstance of these mild preparations of opium being commonly used for children is sometimes attended with fatal consequences, and if in such instances the case happens to come before a coroner who is not more than usually conversant with the provisions of the Pharmacy Act as to the sale of poisons, it is possible that the seller of the medicine may be exposed to considerable inconvenience and even injury, although he may be in no way to blame. Although the reply of the Privy Council to the case submitted by the Council of the Pharmaceutical Society declares that the regulations are to apply only to those preparations of "poisons" which are in themselves deadly or dangerous like the poison they contain,* it must be remembered that in the case now referred to the question of dose has a special importance, and that the administration of such medicines to children may be attended with danger. It seems, therefore, desirable, not only in the interest of the public but also for mere self-protection, that great care should be exercised in the sale of such medicines as are here referred to, and that the buyers should be warned as to their relatively different potency with adults and with children, and especially as to its uncertainty with infants. In this way something may be done towards obviating the possible consequences of ignorance and carelessness. In some houses it is the practice to attach to such medicines a label, stating that they are not to be given to children at all, or only under medical advice.

* Pharm. Journ. 2nd ser., vol. x. p. 568.

But there are other cases in which such a course may be difficult or even impossible, as for instance, in the sale of proprietary preparations, or what are called "patent medicines." A number of these are advertised and sold specially for children, and it is very often only possible to conjecture what they may consist of. From time to time deaths of infants are recorded as resulting from the use of such secret preparations, and at p. 837 will be found a report of such a case where it is supposed the medicine used contained opium, and that an overdose was given. According to the report of the Leeds papers a certain amount of censure was passed upon the seller of the medicine by the Coroner and jury who, assuming the presence of opium, held that the bottle should have been labelled "poison," and considered it was very dangerous to sell poison without a label.

Clearly, if it be necessary to affix a poison-label to any article sold as a proprietary medicine, the obligation to do this rests on the proprietor and not on the retailer, who never even sees the bottle containing the medicine; he sells a sealed packet, and could not sell the article at all if he attempted to break the wrapper for any purpose whatever.

But with proprietary *articles*, such as vermin-killers, the case, although similar in some respects, is in the main essentially different—vermin-killers not being medicines, have no right to any of the exemptions given in the Act. More than that, such of them as contain any poison named in the schedule have been specially added thereto.

In the case of patent medicines, properly so-called, the Chemist and Druggist need not be at any loss to determine whether compliance with the Regulations be necessary, inasmuch as he can learn from the specifications of the patents what the medicines in question may contain. Such cases, however, are very rare. But with proprietary articles, such as vermin killers for instance, how is the retailer to know whether they contain "poison" or not? Should it not be the duty of the manufacturers themselves to indicate in such cases, that the sale of their preparations will have to be conducted subject to the Regulations prescribed for poisons belonging, as it may be, to the first or second part of the schedule, that they may thus retain their right, keeping secret the composition their preparations? The question is one that in consequence of the great number of proprietary articles vended throughout the country, is of grea importance to the body of chemists and druggists, and deserves their serious consideration.

Independently of the particular case which has suggested the foregoing remarks, the present time seems to be appropriate for calling general attention to this subject, since there is some probability of steps being taken with the view of obviating repetitions of the mistakes that have lately been so frequent in the administration of the Pharmacy Act as regards the sale of poisons.

ICED SODA WATER.

New times, new manners; new manners, new tastes; new tastes, new inventions. Our forefathers of the time of Queen Anne declined to dine more than once, after the manner of the ancients, and our co-fathers of the time of Queen Victoria decline to drink after the manner of either. "Give us in our sultry summers," they say, "no fiery stimulants, but beverages as agreeable as champagne, and more innocuous." It is to the credit of our astute cousins, whose new home is popularly supposed to be in the setting sun, that they recognized and deftly ministered to this new want, stimulated thereto without doubt by the thirst natural to their solar domicile.

Messrs. Dows, Clark and Co. were not only early inventors and manufacturers, but we believe their senior partner, Mr. Dows, was the first individual who conceived the idea of a really efficient Iced Soda-water Apparatus. He laid the foundation-stone of what has grown to be a large superstructure; he created what so many ingenious men vainly strive for, a new demand and a new supply. The American public hailed with gratitude his happy combination of cold sparkling gaseous water, flavoured with natural fruits, cunningly modified with cream, sugar and ice. The popularity and consumption of these beverages became enormous; and a very considerable portion of the resulting pecuniary profit fell to the share of our own brethren throughout the United States, in whose pharmacies at the present time one-third of the gross annual returns is frequently yielded by the soda-water counter.

Year after year this firm continue to present to us new forms of their inventions, more desirable either for greater compactness, elegance, or cheapness. Those of our members who were present at the monthly meeting on Wednesday week had the opportunity of seeing the newest form of apparatus, modest alike in size and cost; one that may be displayed during the summer for decoration or profit, and for the rest of the year as a polished mahogany chest, closed and secured with a lock and key. Others of white marble with four silver syrup taps are well suited to beginners, who desire at a moderate cost to gain by every available means reputation and profit.

This firm are also the patentees of an ingenious American invention for securing the irrepressible corks of soda-water bottles, not by the tedious twisting of fine wire and the knotting of coarse string, as customary in England, but by means of a simple metal clasp. When this is gently pressed back, it releases both cork and soda water, but is itself unimpaired, and is immediately ready for use again, lasting as long as the bottle itself. This arrangement appears to us to have many advantages, and we have pleasure in inviting public attention to them.

As will be seen by the official notice on the first page of this Journal, the Annual Meeting of the North British Branch of the Pharmaceutical Society is to be held at noon, on Friday, the 19th inst., in Elliot's Rooms, Princes Street, Edinburgh. It should be understood that all members of the Society and Associates in business are entitled to attend and take part in the proceedings; and as the business comprises the reception of the Report, the election of officers for 1872–73, and the nomination of the Board of Examiners for Scotland, it is to be hoped that as many as can conveniently attend will do so.

On Monday an influential deputation, representing the British Medical Association, the Poor Law Medical Officers' Association, and the Social Science Association, had an interview with Mr. Stansfeld at Gwydyr House, to call his attention to various defects in the Public Health Bill, and to suggest amendments. Mr. Stansfeld promised to consider carefully the suggestions, but thought that an intervening central authority in each district, was unnecessary, and would entail great expense.

Transactions of the Pharmaceutical Society.

BENEVOLENT FUND.

Subscriptions and Donations Received during March, 1872.

SUBSCRIPTIONS.

London.

	£.	s.	d.
Allgood, E. J., 22, Belle Vue Terrace, N.	0	5	0
Allchin, Alfred, Richmond Road, Barnsbury	0	10	6
Anderson, Charles, 23, Lower Belgrave Street	1	1	0
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Attwood, Alfred, 147, Cannon Street	1	1	0
Bacon, J. T., per Mr. Mould, 21, Moorgate Street	1	1	0
Barron, Frederick, Bush Lane	2	2	0
Barnes, J. B., 1, Trevor Terrace, Knightsbridge	1	1	0
Bartlett, William, 1, Bretten Terrace, Chelsea	0	10	6
Beddard, J., 46, Churton Street, Belgrave Road	1	1	0
Beedzler, John, 30, Chesham Street, S.W.	0	5	0
Betty, C. S., Park Street, Camden Town	0	10	6
Binge, Thomas, 23, Stockbridge Terrace, S.W.	0	10	6
Bird, Robert, 74, High Street, Clapham	0	10	6
Bolton, Thomas, 98, Queen's Road, Dalston	0	5	0
Brooks, Charles, Southville, Wandsworth Road	0	10	6
Buck, Thomas, 552, Kingsland Road, E.	0	10	6
Burden, Thomas, 6, Store Street, Bedford Square	0	10	6
Chapman, S. J., 11, Grove Street Road, Broadway, Victoria Park, South Hackney	0	5	0
Chard, Frederick J., 39, Warwick Street, S.W.	0	10	6
Charity, W., 7, Fen Court, E.C.	0	10	6
Chubb, James C., 102, St. John Street, E.C.	1	1	0
Cocksedge, Henry B., 20, Bucklersbury	0	10	6
Covell, W. Mann, 302, Mare Street, Hackney	0	5	0
Coles, John W., 197, Camberwell New Road	0	10	6
Cooke, John, 126, Hoxton Street, N.	0	10	6
Cracknell, Charles, 217, Edgware Road, W.	2	2	0
Crosby, J., New Wandsworth	0	10	6
Cruse, James C., 27, Canonbury Place	0	5	0
Darby and Gosden, 140, Leadenhall St.	2	2	0
D'Aubney, Thomas, 82, Shepherdess Walk	1	1	0
Davies, William, 292, Gray's Inn Road, W.C.	0	10	6
Deane, Henry, 17, Pavement, Clapham	1	1	0
Dyson, W. Bedford, 4, Gloucester Road, S. Kensington.	0	10	6
Eade, George, 72, Goswell Road, E.C.	0	10	6

	£.	s.	d.
Eade, James, 72, Goswell Road, E.C.	0	10	6
Ellis, George Henry, 4, Finsbury Pavement, E.C.	0	10	6
Elvey, Thomas, 8, Halkin Street West	1	1	0
Evans, H. Sugden, 60, Bartholomew Close	1	1	0
Farmer, John, Putney	0	5	0
Fitch, Robert Owen, 200, Well Street, Hackney	0	10	6
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Francis, George Baggett, 5, Coleman Street, E.C.	1	1	0
Froom, W. Henry, 75, Aldersgate Street	1	1	0
Gabriel and Troke, 82, City Road	2	2	0
Gadd, Henry, High Street, Kingsland	1	1	0
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Gadd, Charles, 1, Harleyford Road, Vauxhall	0	10	6
Gale, Henry, 3, Millbrook Place, Camden Town	0	10	6
Gater, J., 251, Balls Pond Road	0	10	6
Gedge, W. Stedman, 90, St. John Street, E.C.	0	10	6
Goddard, G. Edward, 37, Chapel Streeet, S.W.	1	1	0
Granger, Edwin John, Upper Clapton, E.	1	1	0
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Hayles, Bros., Esplanade, Ealing	1	1	0
Hodgkinson and Co., 127, Aldersgate Street	2	2	0
Hodgkinson, Charles, 127, Aldersgate Street	0	10	6
Hooker, T. Ellis, Plough Court, Lombard Street	0	10	6
Hooper, Leonard, 43, King William Street	0	10	6
Hooper, Bartlett, 43, King William Street	1	1	0
Howden, Robert, 78, Gracechurch Street	1	1	0
Hugill, John, 147, Cannon Street	1	1	0
Humpage, Benjamin, Turnham Green	0	10	6
Hunt, Charles, 29, Chapel Street, S.W.	0	10	6
Hunter, John, 45, Kensington High Street	0	5	0
Jones, Fredk., 175, Kentish Town Road, N.W.	0	5	0
Jones, Thomas, Putney	0	5	0
Jones, Wm. John, 3, Newland Terrace, Kensington	0	10	6
Kemp, Robert, 205, Holloway Road, N.	0	10	6
Kent, Thomas, 226, Blackfriars Road	0	10	6
Kent, Thos. Ramsey, 226, Blackfriars Road	0	10	6
King, Thomas W., 108, Crawford Street, W.	0	5	0
Knight, James, New Park Rd., Brixton Hill	0	10	6
Lawrence, Fredk., 383, Kentish Town Road, N.W.	0	10	6
Leech, Elizabeth, Effra Hall, Brixton	0	10	6
Lescher, J. S., 60, Bartholomew Close	1	1	0
Lewington, Alexr. B., 14, Cleveland Street, Fitzroy Square	0	10	6
Malden, W. W., 195, Brompton Road	1	1	0
Masson, George, 43, King William Street	0	10	6
Maw, Son, and Thompson, 11, Aldersgate Street	2	2	0
Maw, Charles, 11, Aldersgate Street	1	1	0
Merrell, James, 1, Queens Terrace, Camden Villas, N.W.	1	1	0
Mitchell, John, 254, Upper Street, Islington	0	10	6
Mould, Samuel, 21, Moorgate Street, E.C.	0	10	6
New, Walter W., 238, Essex Road, N.	0	10	6
Newzam, Henry Saml., 40, Theberton Street, Islington	0	10	6
Nicholson, Fredk., 216, St. Paul's Road, Highbury	1	1	0
North, Geo. T., 81, Cornwall Rd., Westbourne Park, W.	0	10	6
Northway, John, 27, Gt. Tower Street	1	1	0
Penrose, Arthur W., 5, Amwell Street, E.C.	0	10	6
Pickering, Bernard, 23, Brompton Road, S.W.	0	10	6
Preston and Sons, 88, Leadenhall Street, E.C.	2	2	0
Quinlan, Joseph, 59, Barnsbury Road, N.	0	10	6
Ringrose, George, 123, St. George Street East	0	10	6
Rouse, Fredk. Joseph, 114, High Street, Clapham	0	10	6
Rowe, Robert, 40, Alfred Place West, S. Kensington	0	10	6
Rowntree, Thomas, 1, Westbourne Rd., Barnsbury	0	10	6
Schacht, W., 6, Finsbury Place South, E.C.	0	10	6
Selleck, Edward, Apothecaries' Hall	0	10	6
Sheppard, Alfred, 51, Holywood Road, W. Brompton	0	10	6
Sparrow, Wm. C. F., 2, Ranelagh Terr., Pimlico	1	1	0
Stathers, John, 43, Norland Road, Notting Hill	0	10	6
Stocken, James, 33, Euston Square	0	5	0
Strickland, W. Henry, 40, Alfred Place West, South Kensington	0	10	6
Taplin, Wm. Gilbert, 75, Hampstead Road	1	1	0
Thompson, John, 11, Aldersgate Street, E.C.	1	1	0
Thompson, Henry, 11, Little Britain	0	5	0
Thompson, H. A., 22, Worship Street, E.C.	1	1	0
Tibbs, Frederick, 81, Chalk Farm Road, N.W.	0	10	6
Vizer, Edwin B., 63, Lupus Street, Pimlico, S.W.	1	1	0
Warner and Co., Charterhouse Square	1	1	0
Wastie, Francis, 183, Lower Kennington Lane	0	10	6
Westrup, Joseph Boak, 76, Kensington Park Road, W.	0	10	6
Whincup, William, 404, Essex Road, N.	0	10	6
Wooldridge, John, 310, Euston Road	0	10	6

COUNTRY.

	£.	s.	d.
Abingdon, Preston, A. P.	0	10	6
Acton, Jackson, C.	0	10	6
Alford, Hay, William	0	5	0
,, Shaw, C. J.	0	10	6
Alfreston, Robinson, J. S.	0	10	6
Annan, McKinnell, R.	0	10	6
Ashford, Steadman, W.	0	10	0
Bacup, Mace, James	0	10	6
Banbury, Falkner, R.	0	10	6
,, Ball, G. V.	0	10	6
Barrow-in-Furness, Steel, Thos.	0	10	0
Bath, Ekin, Charles	0	10	6
Bedford, Anthony, J. L.	0	10	6
,, Corrie, Isabella A.	0	3	0
,, Ekins, John	0	5	0
,, Taylor and Cuthbert	0	10	6
,, White, J. L.	0	5	0
Belper, Burkinshaw, W. T.	0	5	0
Birmingham, Mantell, C.	0	10	6
,, Rowbotham, G. H.	0	10	6
Bingley, Gill, George	0	2	6
Blackburn, Hindle, James	0	2	6
Blandford, Groves, W. E.	1	1	0
Bodmin, Williams, J. D.	1	1	0
Boughton, Welborne, G.	0	10	0
Bournemouth, Mason, John	0	5	0
Bowling, Yorks., Sowden, S.	0	5	0
Bradford, Lambert, T.	0	5	0
Brampton, Younger, Thos.	1	1	0
Bridgnorth, Steward, W.	0	10	6
Brighton, Bradley, T. D.	0	5	0
,, Noakes, R.	0	10	6
,, Savage, W. D.	0	10	6
,, Savage, W. W.	0	10	6
Broseley, Stevens, J.	0	10	6
Buckingham, Sirett, George	0	10	6
,, Sirett, G. B.	0	10	6
Bury, Crossley, E.	0	5	0
Caistor, Levick, G. A.	0	3	0
Chelmsford, Baker, Garrad	0	10	6
,, Baker, C. P.	0	10	6
,, Seaton, Geo.	1	1	0
,, Tomlinson, Jas.	1	1	0
Chester-le-Street, Greenwell, R. H.	0	10	6
Chichester, Long, W. E.	0	10	6
,, Pratt, John	0	10	6
Chipping, nr. Preston, Watson, J. B.	0	5	0
Chulmleigh, Joint, R. J.	0	6	0
Cirencester, Smith, C. S.	1	1	0
Cockerton, Wilson, William	0	5	0
Conwill Elvet, Carmarthen, Rees, David	0	10	6
Coventry, Bird, Frederick	0	10	6
,, Hinds, James	0	10	6
Crewe, Bayley, W.	0	10	0
Croyland, Wilson, G.	0	5	0
Darlington, Swenden, James	0	10	0
Dartford, Sandy, F. W.	0	10	6
Dewsbury, Foster, Abraham	0	10	6
,, Fox, George	0	10	6
Doncaster, Atkinson and Stephen	0	1	0
,, Dunhill, Son, and Shaw	0	5	0
,, Howarth, J.	1	10	6
,, Slack, W.	0	5	0
Dorchester, How, W.	0	10	6
Douglas, Isle of Man, Brearey, W. A.	0	5	0
Durham, Willan, James	0	10	6
Ealing, Barry, Thomas	0	10	6
Emsworth, Waters, H. G.	0	10	6
Enfield, Radford, W. R.	0	5	0
Eton, Bingham, W. H.	0	10	6
,, Lewis and Son	1	1	0
Everton, Blundell, John	0	10	6
Eynsham, Carr, W. M.	0	10	6
Fareham, Batchelor, Charles	0	5	0
Farnham, Crook, Mrs. G.	0	10	6
Folkestone, Cadman, D. C.	0	10	6
Gamrie, Stephen, J.	0	3	0
Gateshead, Elliott, Robert	0	10	6
Gomersal, Parkin, W.	0	2	6
Goole, Chantry, Geo.	0	5	0
Gorleston, Suffolk, King, F. R. M.	1	1	0
Grantham, Gibson, J. B.	0	10	6
Greenheys, Manchester, Skellon, W.	0	5	0
Grays, Essex, Soole, J. H.	0	10	6
Gt. Bedwyn, Wilts, Gerard, G. R.	0	10	6
Gt. Berkhampstead, Rippon, R. O.	1	1	0
Gt. Missenden, Coles, G.	0	5	0
Guildford, Busby	0	5	0
Guisbro', Graham, T. R.	0	10	0
Harpenden, Busby, James	0	10	6
Harwich, Bevan, C. F.	1	1	0
Heage, Derbyshire, Bates, George	0	10	6
Hertford, Lines, George	0	10	6
Hinckley, Pridmore and Nephew	1	1	0
Hornsea, Heslop, John	0	10	6
Horsforth, Leeds, Wynn, Frederick	0	10	0
Howden-on-Tyne, Robson, M.	0	10	0
,, Saville, John	1	1	0
Hull, Kellington, M. L.	0	12	6
Hyde, Oldfield, H.	0	10	6
Ilkeston, Fletcher, W.	0	10	0
Ilminster, Thetford, Henry	0	10	6
Inverary, Rodger, J.	0	5	0
Kibworth, Leicester, Potter, Fanny E.	0	10	6
Kendal, Hind, T. W. L.	1	1	0
Leamington, Newby, C. A.	1	1	0
Leicester, Clark, W. B.	0	5	0

	£.	s.	d.
Leicester, Cooper, Thos.	0	10	6
,, Salisbury, W. B.	0	10	6
Lewes, Head, John	0	10	6
,, Martin, J.	0	10	6
Leyland, Hackforth, F.	0	10	6
Lincoln, Clark, F. J.	1	1	0
,, Peppercorn, B.	0	10	6
,, Tomlinson, C. K.	0	10	6
Lindley. Nicholson, E.	0	10	6
Llandovery, Morgan, T. L.	0	10	6
Llandyssil, Evans, Joshua	0	10	6
Llanelly, Hughes, E.	0	10	6
Liverpool, Baxter, Wm.	0	10	6
,, Lloyd, J. W.	0	10	6
,, Williams, W.	0	5	0
Lymington, Madge, J. C.	0	10	6
,, Peat, W.	0	10	6
Macduff, Henry, A.	0	5	0
Malpas, Roberts, James	0	2	6
Manchester, Arkle, Wm.	0	5	0
,, Casey, E. (*Ancoats*)	0	2	6
,, Wealthal, A.	0	10	6
,, Mitchell, John	0	10	6
Mansfield, Oldham, J. M.	0	10	6
Mattock, Tullidge, R.	0	5	0
Masborough, Soppett, R.	0	10	6
Minchinhampton, Simpkins, J.	0	10	6
Newcastle-under-Lyme, Cartwright, W.	0	10	6
Newcastle-on-Tyne, Potts, Thos.	0	10	6
,, Proctor, B. S.	1	1	0
,, Watson, T. E.	0	10	0
New Thornley, Smith, Isaac	0	10	6
Northampton, Barry, James	1	1	0
,, Mayger, W. D.	0	10	6
,, Shipman, J. J.	0	10	6
North Shields, Hunter, Thos.	0	10	0
North Walsham, Norfolk, Bailey, G. W.	0	5	0
Nottingham, Smith, William	0	5	0
Oakenshaw, Johnson, M.	0	10	0
Oxford, Hitchcock and Son	1	1	0
Peterborough, Bright, R.	0	10	6
,, Heanley, M.	0	10	6
Pill, Wilde, George	0	10	6
Plymouth, Hill, R. C.	0	10	6
Portsoy, Clark, James	0	10	6
Richmond, Surry, Hopwood and Son	1	1	0
Rochdale, Bamford, J. W.	0	2	6
Rock-ferry, Dutton, John	1	1	0
Romford, Lasham, J. W.	0	10	0
Rugby, Garratt, J. C.	0	5	0
,, Garratt, Samuel	0	5	0
,, Lewis, T. C.	0	10	0
Sale, Cheshire, Smith, Allen	0	5	0
Sedgley (near *Dudley*) Thompson, J. W.	0	10	6
Shanklin, Isle of Wight, Brown, A. H.	0	10	6
Southampton, Palk, E.	1	1	0
,, Randall, W. B.	1	1	0
Southwell, Notts., Stanley, R. S.	0	10	0
Spennymoor, Durham, Prudhoe, R.	0	10	0
St. Day, Corfield, T. J. F.	0	10	6
St. Helen's, Lancs., Sherlock, T.	0	10	6
Stacksteads, Turner, James	0	5	0
Stirling, Walker, Thomas	0	10	0
Stockport, Royse, R.	0	10	6
Stockton-on Tees, Bainbridge R. R.	0	2	6
,, Brayshay, T.	0	10	6
,, Brayshay, W. B.	1	1	0
,, Clark, W.	0	2	6
Sunderland, Nicholson, J. J.	0	10	6
Sydenham, Holloway, T. H.	0	10	6
,, Pocklington, J.	0	10	6
Taunton, Evans, J. J.	0	5	0
Thornton-in-Craven, Wilson, Thomas	1	1	0
Torquay, Bridgman, W. L.	0	5	0
Tow Law. Rutherford, E.	0	10	6
Trowbridge, Dyer, F. W.	0	10	6
,, Dyer, Henry	0	10	0
Tunbridge. Milledge, T. E.	0	10	6
Uppingham, Hope, William.	0	10	6
Upper Norwood, Birch, H. C.	1	1	0
Walton-on-Thames, Power, Edward	0	10	6
Watford, Chater and Son	1	11	6
Welwyn, Lawrence, E.	0	11	0
West Bromwich, Bullus, John	0	5	0
West Hartlepool, Emerson, Cuthbert	0	10	6
Whaleybridge, Ash, H. A.	0	10	6
Whitby, Stevenson, John	1	1	0
Wigan, Polding, P.	0	10	6
Windsor, Boyce, J. P.	0	10	6
,, Collins, H. G.	0	5	0
,, Crook, Edward	0	10	6
,, Grisbrook, E.	0	10	6
,, Griffiths, A. W.	0	10	6
,, Russell, C. J. L.	0	10	6
,, Squire, James	0	5	0
,, Weller, G.	0	10	6
Windsor, Weatherhead, E.	0	10	6
,, Leigh, J.	0	10	6
Withernsea, Ward, John	0	2	6
Wolverhampton, Perkins, J.	0	10	6
Yarm, Yorks., Reed, George	0	10	6
Yspytty, Llanrwst, Davies, Thomas	0	5	0
"Nemo"	0	5	0

DONATIONS.

	£.	s.	d.
Arkell, William C., Fairford, Gloucestershire	5	5	0
Dunhill, William, 33, Hall Gate, Doncaster	5	5	0
Gratton and Co.'s Assistants' Pharmaceutical Association, Belfast	1	5	0
Meatyard and Sapp, Basingstoke	1	1	0
"No Name"	0	10	6

NORTH BRITISH BRANCH PHARMACEUTICAL SOCIETY.

The Fourth Meeting of the Session was held in Craigie Hall, St. Andrew Square, on Tuesday evening, 26th March, at half-past eight o'clock.

Mr. Baildon, President, in the chair.

A very interesting paper on "Neurotics" was read by Dr. MacKendrick, Assistant-Professor of Physiology in the Edinburgh University.

The lecture was accompanied by interesting experiments. The first was on a frog, which was decapitated. Dr. MacKendrick then pinched one of its limbs and showed the reflex nervous action, causing the animal to draw itself up. This movement, he explained, was not accompanied by pain, but was merely mechanical. The next experiment was on a rabbit, under the skin of which the fractional part of a grain of strychnia was introduced, producing convulsions and finally death. The lecturer then explained that chloral was in a modified sense an antidote to strychnia, and introduced fifteen grains of it under the skin of another rabbit, producing in a short time complete prostration. Strychnia was then introduced, and the rabbit, though weak, began to recover, the recovery being accompanied by slight convulsive movements. At the conclusion, the limbs of the frog were acted on by electricity in various ways.

A vote of thanks to the lecturer terminated the proceedings.

Provincial Transactions.

HULL CHEMISTS' ASSOCIATION.

A Meeting of the above Society was held at the Cross Keys Hotel on Monday, 8th inst.; the President, Mr. Atkinson Pickering in the chair.

The President read a letter from the Secretary, Mr. C. B. Bell, asking to be relieved from his duties as secretary until 1st June, owing to severe illness; and the President moved that Mr. Bell's wish be acceded to.

Mr. Baynes seconded the motion, coupling with it a request that Mr. Anthony Smith would continue to fill the office until the time named.

Mr. Smith stated he had great pleasure in taking the duties.

Mr. Baynes moved that Mr. Niven, the Curator of the Botanic Gardens, be requested to give his usual course of lectures on Botany, and that the President and Vice-President wait upon Mr. Niven and arrange with him, and that circulars be issued calling the attention of the apprentices and assistants to the advantages offered by the lectures.

The President read the following paper on Provincial Pharmaceutical Education:—

"The establishment of provincial schools of pharmacy is a subject of the greatest importance to the rising generation of pharmacists in the country. There ought to be such a school in every large town, for the benefit of the apprentices of the chemists and druggists in them, and in the neighbourhood surrounding them. It is now a subject of paramount importance that apprentices, during their apprenticeship, shall receive such a scientific training as will enable them at least to pass the Minor examination when they are out of their apprenticeship. It is also equally as important for their masters that they should do this with credit to themselves, as well as that they should be instructed in the practical part, and be made men of business. The fact, however, should never be lost sight of that our calling, although a profession in principle, is a trade in practice. Adam Smith lays down the rule that whenever goods are given in exchange for money, that constitutes trading. Therefore it becomes most important that the instruction given in these schools shall be of such a character as will enable the students when they commence business for themselves to reduce it to practice and to turn it to profitable use. However scientific it may be to determine correctly the colouring matter of a butterfly's wing, such knowledge in a matter of fact world, such as this of ours is, would go a very short way towards providing a dinner for a man's table. Therefore I advocate that the instruction given shall be as much as possible of a practical character and have special reference to pharmacy and its collateral sciences.

"The establishment in Bloomsbury Square, with its able lecturers, its laboratory, its library, its museum of materia medica, and its lecture-hall containing everything necessary to illustrate the lectures delivered therein, enables the London apprentices and assistants to become thoroughly instructed in every branch of their profession. Now, whilst the country members do not begrudge their town brethren their noble institution and the advantages which they possess, they feel that the institution as a means of education to the country apprentices and assistants is comparatively valueless. It therefore becomes a serious question how this lack of service is to be supplied. I think in all large towns this difficulty may be got over by forming provincial schools of pharmacy affiliated with the parent Society in London. I do not see any difficulty in establishing these schools. Let a room be rented; if in a literary and scientific institution, church institute, or other public building, so much the better. The furniture and the fittings may be of a very inexpensive character. The cost of them and of the apparatus necessary to illustrate the lectures on chemistry, of specimens to illustrate those on materia medica, botany and pharmacy need not be large, and once obtained could be kept up at small cost. This would be all that is necessary to commence the school. A library in connection with it is most desirable, and that and other things would follow in due course. It may be asked how are the funds to be raised for these purposes? I answer that there should be no difficulty here, but that the local members of the trade ought to subscribe liberally for this purpose, and from what I know of the country members' pluck and determination, I feel persuaded that they would do so; and not only carry out what I have suggested, but supply the rooms with everything that is needful to found first-class schools.

"It now becomes necessary to consider how these schools are to be permanently supported. I answer by subscriptions from the local members, by fees from the students, and by very liberal grants of money from the funds of the Pharmaceutical Society. For this object the country members are entitled to their fair share of the income of the Society, to which they have so long and so largely contributed, and whose success is in a great measure due to them, and from which they have hitherto received little or nothing in return. According to the last annual report of the Society, it possesses a large surplus income. The Council ought to feel that it is not only a duty incumbent upon them, but a privilege to extend, to encourage, and to foster pharmaceutical education throughout the kingdom. May I ask for what their charter of incorporation was granted? What steps have they hitherto taken to extend pharmaceutical education in the Provinces? To make grants to libraries, to lend materials for class-teaching, or a few apparatus for a period of fourteen days, cannot be construed towards forwarding this object. The country chemists have taken this subject in hand, and will not let it rest until they have established on a sound and a firm basis these provincial schools. They are a majority of the Society, and it rests with themselves to vindicate their rights, and to maintain their proper position in it, and to demand their fair share of its income. For this purpose I hope there will be established in every large town, a Chemists' Association to form and to watch over these schools. I think the Council ought to grant at least thirty pounds a year to each of them, which will be some proof that they take an interest in the matter, and I think that the funds of the Society will allow this without at all injuring the institution in Bloomsbury Square.

"Having got the schools established, the next thing will be to find a lecturer who is competent to instruct in chemistry, materia medica, botany and pharmacy, and also the translating and dispensing of prescriptions. To prevent jealousy, as a rule, I would say that he ought not to be a man who is in business in the town in which he lectures. There are in most towns members of the medical profession who would be willing to undertake the duty. To enable the lecturer to do so with the greatest advantage to the students, I think that it is desirable that he should be furnished with copies of the questions used for three or four previous examinations for the Minor and the Major, and I have no doubt the Council will gladly furnish him with such. Here, in Hull, we have been fortunate in obtaining lecturers who are well up in the above subjects; those on chemistry, materia medica, and practical pharmacy are delivered by an able member of the medical profession. The lectures on botany are delivered by the curator of our Botanic Garden, where his lectures are illustrated by living specimens. Very fortunate have we been in securing the services of one so eminent in his profession. It was a source of much pleasure to me, at the last supper of our Chemists' Association, to hear the lecturers speak in such kindly terms of the attention of the students. I have no doubt but there will at all times be found members of the trade who will feel proud to present prizes for each subject of study, for students to contend for.

"It cannot be too forcibly impressed upon the minds of apprentices that there is no royal road to learning; that it is only by constant study and reflection that a man can become eminent in any profession. I do not see that there can be any objection, but I think it might be a great advantage to supply any student who may be preparing for either the Minor or the Major, with a printed copy of the questions asked in the previous examinations. This would prove specially valuable to those young men in small country towns who cannot have the advantage of attending a course of lectures.

"It will be two years, at the next Annual Meeting, in May, of the Pharmaceutical Society, since the subject of Provincial Pharmaceutical Education was brought prominently before and commended to the serious consideration of the Council. During the past year the sums voted by them for that purpose amounted to £48. With the exception of the Journal, this was all that the country members of the Society received for educational purposes out of income, for the same space of time, amounting to above £10,000.

"I beg to commend to the serious consideration of the members of the Society, but especially to the country members of it, the report contained in the Journal for

April 6th, of the last meeting of the Council held on April 3rd, where this subject was again brought under discussion. I presume not to make any remark on, but leave it to them to form their own opinion of the speeches then made. I do not wish to say one disrespectful word of any of the members of the Council, for many of them are eminent in their own profession. But I think at the next election that it is desirable that many of them should give place to others, holding broader views, better ideas of their duties and responsibilities, and deeper sympathies with the interests of the country members of the Society on this subject."

A long discussion ensued, and on the motion of Mr. Myers, seconded by Mr. Baynes, the best thanks of the meeting were accorded to Mr. Pickering for his paper.

LIVERPOOL CHEMISTS' ASSOCIATION.

The ninth General Meeting was held at the Royal Institution on Thursday evening, February 29th; Mr. Charles Jones (Vice-President) in the chair.

The Hon. Secretary exhibited a new spirit-lamp, of French invention, which was much admired.

Mr. J. T. Armstrong exhibited specimens of artificial butter and milk, the same as used by the inhabitants during the siege of Paris, and read a short paper on its composition. The following is an abstract:—

The saying that it is an "ill wind that blows no one any good" was fully shown in many ways during the siege of Paris. This can be fully seen on looking at the great success attained by the thoughtfulness and skill of some of our French chemists in producing articles of food from very unpromising sources. They went to work scientifically, not with the view of producing the materials themselves, but chemical imitations; starting in their researches by ascertaining the component parts of the material wanted, and mixing in the same proportion as in the natural article, and so producing the artificial, and this with very excellent results.

Among the articles produced by them, were what was called "siege butter and milk," and the following is the way in which they were made:—

For the milk take 47 grms. of finely-powdered sugar, 30 grms. of the white of an egg, or a sufficient proportion of gelatine, add one part of warm water, and about one grm. of carbonate of soda. These are to be mixed with 60 grms. of a pure and tasteless oil, or fat obtained by frying; well agitate the whole; a pasty liquid is obtained, which, when diluted with about an equal bulk of water, has the same nutritive value and chemical composition as milk.

The butter is obtained by what is called the frying process, which has been known to a few in England for some time. By it some of the most disagreeable smelling and tasting oil may be rendered quite pure and tasteless, and also of the same consistency as ordinary butter.

Mr. A. H. Saunders exhibited an improved tincture press, manufactured for Messrs. Austin and Co., by which an enormous pressure can easily be brought to bear upon the product to be extracted, the main advantages appearing to be its simplified action and cheapness.

Mr. A. H. Mason, F.C.S., exhibited a specimen of ferri citras et quiniæ (syrupy), a convenient form for dispensing: one fluid drachm equal to 60 grains by weight of ferri cit. et quiniæ, B. P. scales.

Mr. Mason read a paper upon Xylol ($C_8 H_{10}$), one of the hydro-carbons homologous with Benzol, said to have been employed successfully in Berlin as a remedy against smallpox.

On the motion of Mr. A. H. Saunders, seconded by the Chairman, a unanimous vote of thanks was awarded to the contributors of the miscellaneous communications, and the meeting adjourned.

The tenth General Meeting was held on Thursday evening, March 14th; the President in the chair.

Mr. H. Hiscock was unanimously elected an associate.

Mr. Shaw called attention to the repeated errors in the administration of the Pharmacy Act by coroners and magistrates, in different parts of the United Kingdom, and instanced the two cases recorded in the Pharmaceutical Journal of March 2nd.

He thought it very desirable that every chemist and druggist should make himself fully acquainted with the Pharmacy Act of 1868, more especially with respect to the schedule of poisons, and those portions having reference to the sale of poisons, so that he may be enabled not only to fulfil all the requirements of the law, but at the same time (the circumstances demanding it) defend himself against any erroneous interpretations, and consequent damage to his interests by those in authority. He thought there was no excuse for such errors being committed, considering that a copy of the Pharmacy Act was sent annually by the Government to every coroner and also to every County Court throughout the country.

BRISTOL PHARMACEUTICAL ASSOCIATION.

On Friday, April 6th, a lecture was delivered by W. A. Tilden, D.Sc. Lond., on "Water and Ice as Geological Agents."

The following memoranda indicate the order in which the subject was treated:—Circumstances influencing the character of scenery. Action of water upon the constituents of soils—mechanical—chemical. Evaporation from the ocean—watery vapour in the atmosphere—condensation of aqueous vapour—rain—hail—snow—accumulation of snow upon mountain peaks—avalanches—glaciers. Evidences of ancient glaciers in the British Isles.

The lecture was illustrated by experiments, photographs and diagrams, shown by a strong light upon a screen.

At its conclusion the lecturer received the compliment of a cordial vote of thanks.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

On Saturday, the 30th of March, the Anniversary Meeting of the Society was held, when the President delivered the customary address, congratulating the Fellows on the increase of their numbers, but pointing out at the same time the comparatively small number of papers communicated to the Society. The apathy and lethargy from which chemical science in this country is at present suffering he believed to be due to a great extent to our system of university education. After the officers and Council for the ensuing year had been elected, and the usual votes of thanks proposed, the meeting was adjourned.

The following is a list of the officers:—

President—E. Frankland, D.C.L., F.R.S.

Vice-Presidents who have filled the office of President—Sir B. C. Brodie, F.R.S.; Warren de la Rue, Ph.D., F.R.S.; A. W. Hofmann, D.C.L., F.R.S.; Lyon Playfair, Ph.D., C.B., F.R.S.; A. W. Williamson, Ph.D., F.R.S.; Col. P. Yorke, F.R.S.

Vice-Presidents—H. Debus, Ph.D., F.R.S.; H. M. Noad, Ph.D., F.R.S.; W. Odling, M.B., F.R.S.; J. Stenhouse, Ph.D., F.R.S.; and W. J. Russell, Ph.D., and Maxwell Simpson, Ph.D., F.R.S., in place of J. H.

Gilbert, Ph.D., F.R.S., and T. Redwood, Ph.D., who retire.

Secretaries—A. Vernon Harcourt, M.A., F.R.S., and W. H. Perkin, F.R.S.

Foreign Secretary—H. Müller, Ph.D., F.R.S.

Treasurer—F. A. Abel, F.R.S.

Other Members of Council—H. Bassett; A. Dupré, Ph.D.; F. Field, F.R.S.; H. M'Leod; H. E. Roscoe, Ph.D., F.R.S.; R. Angus Smith, Ph.D., F.R.S.; A. Voelcker, Ph.D., F.R.S.; and A. Crum Brown, D.Sc., Dugald Campbell, G. C. Foster, F.R.S., Hermann Sprengel, Ph.D., Thomas Stevenson, M.D.; the five last being instead of E. Atkinson, Ph.D., C. L. Bloxam, M. Holzmann, Ph.D., E. J. Mills, D.Sc., and W. J. Russell, Ph.D., who retire.

Thursday, April 4th. The President, Dr. Frankland, F.R.S., in the chair. After the usual business of the Society had been transacted, Dr. Schorlemmer, F.R.S., delivered a very interesting lecture "On the Chemistry of the Hydrocarbons," defining organic chemistry as the chemistry of hydrocarbons and their derivatives. The characteristic properties of the paraffin, olefine, and acetylene series, and their relations one to another were discussed, as also those of the great aromatic group, the speaker pointing out the great assistance derived from the atomic theory in determining both the constitution of isomeric compounds, and also the relations existing between the various members of the aromatic series. After a short discussion the meeting adjourned until Thursday, the 18th instant, when it is announced that eight papers are to be read.

Parliamentary and Law Proceedings.

HOUSE OF COMMONS.

Friday, April 5th, 1872.

The Public Health Bill.

Mr. Stansfeld having moved the second reading of the Bill,

Mr. J. Fielden said there were several points in the Bill to which he took exception. He did not approve of the system of controlling the local authorities provided by the Bill. Although local authorities were not always efficient, the continual interference of a strict central authority would create dissatisfaction and lessen their efficiency by driving the most influential and competent men from the local Boards. Neither could a uniform system be adopted for the whole country. The endeavour of the central authority should be to lay down sound general principles, and leave it to the local authorities to carry out the details. Some alteration, too, would be required in the definition of pollution. As the Bill at present stood, a whole army of inspectors would be required; and the present definition, if carried out, would result in the closing of all manufactures. The questions of water supply, drainage and river pollution were not yet sufficiently understood for legislation. There was no doubt that ashes thrown into a river exercised a deodorizing effect, though, perhaps, that benefit was more than counterbalanced by the filling up of the bed of the river. The plan proposed of letting sewage filter through the soil before running into a river was quite impracticable in some districts, such as the valleys of the West Riding of Yorkshire. He thought that if the clauses relating to the pollution of rivers were not removed, the Bill would run great risk of being rejected, or, if carried, would prove to be a dead letter in many districts.

Dr. Playfair twitted the Opposition with its want of interest, as evidenced by the state of the benches, in the cry of *sanitas sanitatum, omnia sanitas*, recently raised by their leader. He, however, agreed with the right honourable gentleman as to the importance of the subject. He approved of the provision of the Bill, that, while in the country districts the guardians of the poor became the sanitary authorities, in towns the ordinary civic authorities assumed the health functions. Large towns were the characteristics of the country, and formed the urgent motives for speedy sanitary legislation. These towns are much more numerous now than at the commencement of the present century, and were increasing rapidly, outgrowing management by the parochial authorities that were sufficient for the rural districts. The 22nd clause provided for the acquirement by rural districts of all the powers of urban districts when required by altered conditions. There was much to be said in favour of the proposition made by some influential sanitary associations, that there should be an intermediate county authority between the local Boards and the central administration, although there would be difficulties attending such an arrangement. The main advantage of such an enlarged intermediary authority would be the securing of a much higher class of medical officers of health and engineers than the smaller districts could do. The Bill provided that both urban and rural Boards were to appoint medical officers of health, and it suggested that these were to be the Poor Law medical officers. The urban Boards were to appoint, pay, and dismiss these officers at will; but the rural Boards were to pay only one half the salary, the other half being paid out of the Consolidated Fund, and the appointment and dismissal being made subject to the approval of the central Local Government Board. These medical officers had most important functions to perform, requiring much special knowledge, much firmness, and thorough independence. They had to inspect the sanitary conditions of streets and thoroughfares, of schools and factories, and of the dwellings and lodging-houses of the labouring classes. They had to keep a watchful eye on the working of the main and house sewerage. They had to look after nuisances likely to affect health. They must attack the wealthy manufacturer when he polluted the river with the refuse of his works; and they must equally remonstrate with their own masters, the civic authorities, when they poured the sewage of the town into the stream, regardless of those who live lower down in its course. They had also to search out nuisances in dwellings, from the defective drain in the palace, which breeds fever, to the accumulations in the dust-bin of the cottage, which poisoned the air around it. They had to watch the markets, from the shambles of the wealthy butcher to the stall of the humble costermonger. They had to track out disease, associate it with its causes, and watch the progress not only of death rates but of variations of sickness among the population. The medical officer was, in fact, a public inquisitor, requiring much knowledge and tact in the performance of his public duties. But who were the sinners to be delivered over to this public inquisitor? Chiefly the local authorities, in whose hands rested the appointment and dismissal of their inquisitor. The vestryman butcher who sold diseased meat in his shambles; the vestryman cottage owner who had houses; the town councillor who had his mills on the streams—these were the men who sinned against health, and who appointed, paid, and dismissed the inquisitor of their sins. And to what class of medical men did the Bill look for so much knowledge and independence? To the Poor Law medical officers. That was a meritorious, hard-worked, and poorly-paid class of medical men; but they were already borne down by the extent of their curative duties. If extensive preventive duties were added to those, and if even the new work were to be well paid for, though the Bill is by no means explicit as to the payment, what chance is there that both the curative and the preventive functions would be efficiently executed? It would have been possible, by uniting local districts into a county area, to have secured the services of a medical man who relinquished the cure of disease in order to have no conflict between the interests of his patients and those of the public. For a medical man must be well paid to secure independence of action, when he devoted his whole time to the health of communities instead of to the health of individuals. But the Bill made no provision for such officers. Still, he hoped that the President of the Local Government Board would admit that the reasons for wishing them were strong, and that in Committee he would introduce amendments in order to assure the House that the officers appointed would possess, or will soon acquire knowledge of the health of communities, because that was a very different thing from the health of individuals. He hoped that provision would be made for offering a better position and pay to such Poor Law medical officers as passed examinations in the subject of hygiene. As long as local medical officers did not possess a knowledge of public health, inspectors and other officers, appointed by the Central Board, were necessary, and the local officers would be used chiefly as collectors of information to be digested and made useful to the public through a central administration. This centralization of local duties, which he considered to be a misfortune, cropped up in various parts of the Bill. Thus, in the 64th clause, the Local Government Board offered, and sometimes enjoined itself to be analytical chemist for the whole of England. They invited "purchasers of any article of food or drink" in the provinces to send their articles for examination to London. They insisted that potable waters and the waters of polluted streams should be analysed as the Central Board directed. This was a serious matter, for it not only affected the responsibilities of local Boards, but also the interest of science. There were few towns in the kingdom in which well-qualified analysts did not exist. Take, for example, Manchester or Newcastle. Surely an analysis executed in the laboratory of Owens College, in Manchester, or in that of the Newcastle School of Science, would be as good as one made in a London laboratory. Why should Manchester men and Newcastle men be invited to distrust their local science when it was efficient? Let them take what securities they choose for analytical efficiency in localities, but let them encourage rather than discourage local laboratories for local purposes. Our centralization was always injurious, for it weakened local administration; and centralization of science was pernicious, because it prevented the diffusion and stunted the development of science in the provinces. He was glad to find that the Bill dealt with the pollution of rivers, for the subject was ripe for legislation. As to the impossibility of dealing with the subject asserted by Mr. Fielden, the objection was of the character always urged when nuisances were made the subject of legislation. When the late Lord Derby introduced a measure for preventing the pollution of air by the acid gas thrown out by soda works, he did him the honour to consult him on the subject, and asked him if those were processes sufficiently matured to be enforced by law. He told him that they were not; but asserted that if the measure passed the manufacturers would soon mature them. And now 97 per cent. of these gases was prevented from passing into the air, much to the benefit of the public and of the manufacturers themselves. One of the cardinal commandments of the ancient Egyptians was, "Thou shalt not pollute rivers;" and he trusted we were now about to make this a new commandment for this country, for the want of it had produced intolerable evils. Even with the large stream which washed the metropolis, and which was the source of its *quasi*-potable or unpotable water, more than 600,000 human beings poured their *excreta* and filth into it before the Londoners drew it off for their daily water supply. And the dirty water of the Thames was purity itself as compared with that in rivers which flowed past manufacturing towns. The fact was that individuals and communities had exercised unmitigated selfishness in regard to all river courses, for they used them entirely with reference to their own interests, as if those below them in the stream had nothing to do with the flow of water which the bounty of Nature had supplied for the use of all.

Sir H. Selwyn-Ibbetson supported the Bill, but demurred to the selection of Boards of Guardians for rural districts, since they were already overworked. He hoped the Bill would make compulsory the appointment of a public analyst in each district.

Mr. Dimsdale said that different standards of purity had been proposed by the Purification of Rivers Commission and the Water Supply Commission. The standard proposed by the former commission had been adopted in this Bill, but that of the latter was preferred by himself and others. He had received that morning a letter from Dr. Letheby stating that the Public Health Bill of the Government was unworkable as regarded the standard of purity. He proposed to raise this question in a definite shape when they should get into committee, by proposing to substitute the standard laid down by the Water Supply Commission. Dr. Frankland said that if we wished to make the waters of all the rivers and streams throughout the country potable, he did not think this standard would be sufficient; but that it would, if our object was to make them safe as regarded the health of the people.

Dr. Lush said that medical men were entirely dissatisfied with the provisions of the Bill as to the appointment of sanitary inspectors. The nomination was vested in the guardians, who also had to pay them; and there was reason to believe that instead of selecting persons outside the sphere of their own influence, they would nominate the medical officers of their several districts. There was nothing in the Bill which required the guardians to pay these officers for the new duties devolving upon them; they would be mere servants of the Board, and would have no power to carry out the sanitary measures they might think necessary.

Mr. Muntz suggested that clauses should be inserted for the purpose of guarding against the adulteration of articles of food.

Sir Charles Adderley expressed a regret that consolidation had been postponed, although he hoped it might be accomplished next year; and asked that his Bill for that purpose might be read a second time that night. He warmly praised the Government Bill, and defended the selection of the Boards of Guardians to exercise the powers in the rural districts, on the ground that they were a local authority already in existence, whilst it would require considerable time to constitute a new body.

The discussion was continued by Sir T. D. Acland, Mr. Hardy and Mr. W. H. Smith, who, while criticizing various details, gave a general support to the Bill.

Mr. Stansfeld in reply defended the selection of the Boards of Guardians, and protested against the general charge of inefficiency that had been made against them in certain quarters. After explaining the various reasons that led him to adopt the organization proposed in the Bill, he alluded to the appointment of medical officers, and said that it was his desire to keep this question as far as possible open until some progress had been made with the Bill. As soon as he became assured of the precise form in which it would issue from the House, he would present a supplementary estimate with the view of providing assistance for the present staff, and to start the local sanitary authorities with an efficient and complete staff of inspectors. With respect to the question whether in dealing with the pollution of rivers it were possible to lay down any table of chemical tests, he had after consideration arrived at the conclusion that he had better not attempt to draw up a clause binding in all places and under all circumstances, and that he would act most wisely in so shaping the clause that the matter would be left open to the consideration of the House.

The Bill was then read a second time, as was also the Public Health and Local Government Bill.

The Law Relating to Juries.

Tuesday, April 9th.

The Attorney-General gave notice that on Friday he would ask leave to introduce a Bill to amend the law relating to service on juries.

Alleged Poisoning by a Proprietary Medicine.

An inquest was held on Monday, April 1, before Mr. Emsley, the coroner for Leeds, respecting the death of Clara Proctor, the daughter of an upholsterer, residing in New Wortley. It appeared from the evidence that the deceased had been unwell, and had suffered from a bad cough. The mother was recommended by a neighbour to give the child a patent medicine called "Kay's Compound Essence of Linseed." Accordingly she purchased the medicine, and gave the deceased five drops of the mixture in warm water. This was on Thursday, March 28. Soon after taking the dose the child became insensible and was seized with convulsions. Mr. Scott, surgeon, was called in, and found the little thing suffering from what appeared to be poisoning by opium. The usual remedies were applied, but the child died the same day. Mr. Scott made inquiries into the matter, and the bottle containing the remainder of the mixture was shown to him. He was satisfied that the medicine contained a preparation of opium, and he now stated his confident belief that this poison had caused the child's death. The label upon the bottle stated that for a child twelve months old five drops were to be given, but it did not state what quantity should be given to a child under that age. The mother affirmed that as five drops was the least amount named on the label, she thought this was the proper dose to give; she declared, however, that had she known the medicine contained poison, or was in any way dangerous, she would not have used it.

Mr. Pierson, of Wellington Road, druggist, of whom the medicine was obtained, said it was the practice to sell these patent medicines as purchased. There was nothing, he admitted, on the label which would put people on their guard as to using it.

In summing up to the jury, the Coroner pointed out that, by the provisions of the Pharmacy Act, a bottle of any mixture containing poison should be labelled to that effect; the object of this stipulation obviously being to secure caution in use.

The jury were of opinion that the child had died from the effects of the poison, but did not consider that the mother was culpable. They thought it very dangerous to sell poison without a label; and Mr. Pierson promised that he would in future put on such a label, and also call the attention of the makers to the matter.

[*** The following communication has been received from Messrs. Kay Bros., objecting to the foregoing report as being inaccurate in certain particulars, principally as regards the dose given having been more than five drops; and, in justice to them, it appears desirable that their statement should be published, together with the report which has been taken from the Leeds papers. —Ed. Pharm. Journ.]

Messrs. Kay state that they were not informed of the occurrence until after the inquest, but that after an inquiry on the spot by Mr. Hardcastle, chemist, Leeds, Mr. T. Kay, etc., they have ascertained—

That the child was only twelve weeks old, and that it was in a delicate state of health, suffering from whooping-cough, teething, etc.

That the mother was told by Mr. Webster, a neighbour, that Kay's Compound Essence of Linseed would do it good, and that she herself was in the habit of taking a teaspoonful for a dose.

That the mother did not purchase the preparation, as stated in the report, but that she went to the house of another neighbour (Mr. Hardy) with a teaspoon, and had it filled. The mother afterwards sent for the bottle and, it is assumed, gave more.

That instead of only giving five drops, which could not do any harm, she probably gave it two teaspoonfuls, which would be equivalent to giving a delicate adult six fluid ounces.

That this is the opinion of the neighbours, and that the foreman of the jury admitted he and the rest of the jury held a similar opinion, but, under the circumstances, compassionately exculpated the mother, who could scarcely give her evidence.

That the mother did not see the bottle, and, therefore, could not have read the label until after the first teaspoonful had been given, and perhaps a second.

That the mother had previously been giving another medicine of a "pink colour," prescribed by a neighbouring chemist; but that this was not mentioned at the inquest.

That a dose of Kay's Compound is not poisonous, and therefore does not require to be labelled "Poison."

That the label upon it has been in use the last eight years without complaint.

That Mr. C. Pierson wishes it to be stated that he never promised the Coroner to label any proprietary or patent medicine "Poison," and that the statement to that effect in the newspaper paragraph is incorrect.

Review.

Dr. Pereira's Elements of Materia Medica and Therapeutics. Abridged and edited by Professors Robert Bentley and Theophilus Redwood. Longmans, Green and Co. London, 1872.

Pereira's great work on Materia Medica and Therapeutics came into existence about the same period as the Pharmaceutical Society, and the course of the various editions of the one runs beside that of the other. It is not too much to say that without the labours of past and present pharmacists, stored up chiefly in this Journal, the fruits would not have been ready for gathering; whilst, on the other hand, the work commenced and chiefly carried out by the Society's first professor of Materia Medica has reflected no small honour upon the Society with which it was so closely connected. We therefore welcome with pleasure a new edition of the work with which is connected names so well known as those of Bentley and Redwood.

This edition is an abridgement in one volume of the original work, and is emphatically a student's edition, whether he be medical or pharmaceutical. The original unabridged work is a mine of riches, but all that it contains is not of equal value, therefore its very wealth of illustration becomes an embarrassment and a hindrance to the student. In this volume that which is most useful is carefully selected and arranged, and it may be studied throughout as a text book of materia medica; and if even now its size is rather alarming, as extending to one division only of his studies, the student must recollect that his knowledge of chemistry, pharmacy, and botany are all being advanced by its perusal, and also his acquaintance with therapeutics, which, although more important to the medical student, is nevertheless of great interest as well as of great value to the pharmaceutist. This edition brings up the information to the requirements of the British Pharmacopœia of 1867. It also contains, which its predecessor did not, a selection of such other remedies as medical men are in the habit of using. The arrangement is with some modification that adopted by the author in the original work, as in a scientific work a scientific arrangement has a value beyond that which is merely alphabetical, although it may produce some apparent incongruities, and the latter is more convenient for reference. Organic compounds which are not simply extracts from the vegetable kingdom, but products of decomposition, are now included in the first part of the work, which treats of definite chemical compounds; such are hydrocyanic acid, alcohol and sherry, which are now to be found under the head carbon.

The Natural Orders of the plants forming the vegetable materia medica are given as before in a handy tabular form in the Contents; but we could wish that both here and in the body of the work Professor Bentley had felt himself at liberty to discard the Lindleian arrangement, which, following Jussieu, leads up from the simpler to the higher forms of vegetation, and to adopt that which is so familiar in his own valuable manual, and is followed in the works of Bentham and Balfour, and other well-known English botanists. The student is accustomed to see the Natural Order Ranunculaceæ placed at the head of the procession; and he views the reverse arrangement much in the same light as he would the alphabet printed backwards.

The first part of the work is introduced by a short but clear exposition of the new method of Chemical Notation, and the formulæ and decompositions are given in accordance therewith, as well as after the old mode. The pharmacopœia processes are pretty generally given in full in displayed type, whilst, inserted in brackets, are occasional intercalations, which, though consisting of only a few words, supply something that is wanted to make the directions clear. In addition to this, are not unfrequently further explanations of a very useful character, such as the reasons for using certain tests or the various reactions which take place.

There is considerable original matter in connection with the new introductions into the Pharmacopœia of 1867; and the best that can be said of this is that it corresponds in character with the rest. We suppose that as this is an abridgment, the editors were fearful of increasing the bulk; but we were disappointed in some of the new articles—carbolic acid, for instance—and more especially in the short page devoted to hydrate of chloral, in which no tests for purity are given; as considering the great importance of chloral as a remedy, and the enormous extent of its use, we should have expected more to be said, both respecting its chemical history and its physiological effects, although it be not yet introduced into the Pharmacopœia.

Here and there the therapeutics appear to be somewhat antiquated; for instance, under Bromide of Potassium, at page 154, we read, "It is now again made officinal (by the bye why is 'official' generally substituted for this better-known and less hackneyed word?), chiefly on account of its *sedative action on the generative organs*." This may be true, but its powers in this way are denied by some, whilst it is largely used as a hypnotic, and also as a specific in epilepsy. The belief in its resolvent properties, also alluded to, which it was considered to possess in common with the iodides, is now very much abandoned.

In the second part of the work, 'Medicines derived from the Vegetable Kingdom,' we find considerable new matter, and the researches of Mr. Hanbury, Professor Bentley himself, and other pharmacologists are made use of. Amongst the new facts we find that since the publication of the British Pharmacopœia the name of the plant from which Sumbul is obtained, has been determined. It is the *Euryangium Sumbul* belonging to the Nat. Order Umbelliferæ, and the plant yielding it has recently flowered and fruited at Moscow. The same of Galbanum, which is the product of the Ferula Galbaniflua of Buhse, also an umbelliferous plant. Central Asia, from which these and other drugs come, is still the land of mystery, and the marvels of Sir John Mandeville and Ser Marco Polo, are not yet all disproved or set aside. There, drugs were valued and stored up as treasures, and their sources were kept secret lest the barbarians should discover them. Of rhubarb, largely as it is used, it cannot yet be affirmed beyond cavil what is the species of the plant that produces it, notwithstanding that expeditions have been sent out to discover it, and it seems still to hold good "that all the descriptions in all the materia medicas are incorrect." Treating of Russian rhubarb, the editor states that some former remarks respecting its being obtainable through Moscow merchants still hold good, but knowing that the genuine article had not been procurable for some years past, we wrote to Messrs Horner, and their reply is as follows:—"Untrimmed Russian rhubarb has within the last two years been offered to us through Moscow, but the samples sent us were hardly, if at all, different to that we receive direct from China; and we much doubt that the root was ever subjected to the compulsory Russian mode of curing during the time of the Russian Government monopoly, namely, round the necks of the sheep and goats. As an article of commerce it cannot now be said to exist." The concluding paragraph, under the head Russian Rhubarb, might, under these circumstances, have been spared. It states that "as met with in the shops it is almost invariably mixed with the powder of English rhubarb." The name "Turkey Rhubarb," serves to distinguish it with the public from garden rhubarb, but whatever might once have been the case, we think that the commercial morality of pharmaceutists has much improved since the paragraph was written. There is also mentioned the discovery of Mr. Hanbury, that the ordinary Pareira Brava of commerce is not derived from the *Cissampelos Pareira*, as stated in the British Pharmacopœia but from some other menispermaceous plant of Brazil. Samples of the genuine drug are in the form of long cylindrical stems about half an inch in diameter, the large concentric zones so strongly marked in the Pareira root of commerce being absent.

The publishers have not been very liberal in the matter of woodcuts, some of those inserted not being of very great importance. For example illustrations of hyoscyamus, belladonna, and stramonium plants would have had much more practical utility, than that of the machine used for rasping the roots of tous-les-mois. On the other hand, there is a good illustration of aconite root. It is well for the pharmacist to have plates of important plants like these to turn to, so that if he has necessity, he may moisten a leaf in his possession and spread it out for the purpose of comparison. Leaves, roots, and seeds of indigenous plants, which were formerly almost entirely supplied by collectors here, are now imported from Germany rather extensively, and are not always genuine; moreover, they are sent over in a very careless manner, so that it is desirable to be well informed respecting them. The references to the plates in Stephenson and Churchill and other works are but of little use to the ordinary student or pharmacist, as but few possess them. If Professor Bentley would superintend and Mr. Fitch would execute a series of wood engravings of medical plants, it would be a boon to the joint professions of medicine and pharmacy that ought to find support.

In supplementing the Materia Medica of the Pharmacopœia, the editors do not profess to have gone beyond the introduction of such other remedies only as are frequently used; it would, therefore, be out of the question to expect an article upon Condurango; but amongst others omitted we could name such remedies as Nitrite of Amyl, a powerful agent not unfrequently employed, and Leptandrin, with others of the eclectic remedies, which we think deserved notice. There are many remedies that are only occasionally called for, concerning which a pharmaceutist may want information that he finds it very difficult to obtain. If the same editors would undertake an edition of the unabridged work, bringing up the information to the present date in the same able manner they have done in this, and introducing all manner and kinds of medicinal substances, thus rendering the work a complete Encyclopædia of Pharmacology, they would confer a boon upon the practical pharmacist as great as they have now done upon the stndent. At present, in spite of a few deficiencies, the work ranks as the best students' text-book and ordinary counter manual of Materia Medica.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

"The Mysterious Councillor."

Sir,—When the writer of so contemptible and scurrilous an article as that which appeared in the *Chemist and Druggist* last month under the above title, screens himself beneath the folds of an anonymous production, he cares not upon whom the suspicion of authorship is cast, so long as he himself escapes recognition.

It has just come to my knowledge that the report which first saddled the article in question upon Mr. Ince, has, since his denial, been kindly transferred to my shoulders, and that I am now currently reported as the writer. I therefore desire most distinctly to deny having had the least knowledge even of the existence of the article, until my attention was, some days after its publication, drawn to it by a friend.

However much I doubt the wisdom of re-electing Mr. Carr as a representative upon the Council, I hope I possess too high an opinion of the responsibilities of a gentleman than to lend myself to such "vulgar personalities."

I should have treated the rumour with silent contempt, had it not been that my position as Hon. Sec. to the Metropolitan Chemists' Defence Association, demands my being free from the imputation.

Edwin B. Vizer.

63, *Lupus Street, Belgravia South.*
April 9*th*, 1872.

[*** The fact that rumour has attributed to several persons the authorship of the paragraph referred to in this letter, seemed to make it advisable, to prevent the necessity for publishing a succession of denials; by inquiring of Mr. Carr whether the writer was known and as we are authorized by him to state that the authorship of the paragraph has been acknowledged, we think no further disclaimers will be required. —Ed. Pharm. Journ.]

The Coming Election.

Sir,—Let me at once express regret for my letter on Election of Council. I am as ready to admit that it was injudicious (judged by the light of subsequent experience) as I am prepared to prove that it was not dishonest. This, however, scarcely concerns your readers, and does not occasion me more anxiety than I am able to endure in silence. It does concern your readers to know whether Mr. Savory, who has been proposed for the Council ostensibly on grounds of general fitness, is in reality the representative in disguise of compulsory regulation views. To this I say that up to the present moment I do not know what Mr. Savory's opinions upon this question are, that I have never had any communication with him direct or indirect upon the subject, and that I consider his reticence in reference to a point which has excited so much animosity a material recommendation.

Beyond the fact that his firm are understood to have signed Mr. Sandford's circular (which was also signed by Mr. Ince, who is known to be strongly opposed to compulsory regulations), I have no clue to Mr. Savory's opinions upon this or any other question of pharmaceutical politics; but if I knew his views upon special questions to be at variance with my own, unless they were extreme and extravagant, I should still feel that his election to the Council was desirable in the permanent interests of the Society. It should be remembered in pronouncing judgment upon my motives, that my sole utterance in relation to the poisons regulations since May, has been to counsel peace and a resumption of our ordinary pursuits;* and, in fact, I attach less importance to the future action of the Society in reference to poison regulations than appears to be supposed. I anticipate a grand organic severance which will settle this question for us, but which it is not convenient to discuss here. In the meantime, I am very jealous of the Society's administration being swamped by an ephemeral excitement; and it appears to me to be our duty at this crisis to select men of such standing, character, and (preeminently) moderation, as may restore confidence and harmony to our agitated community.

In seeking to urge these views, I am exceedingly sorry that I was guilty of the indiscretion of introducing Mr. Savory's name; it is due to him, though it should not be necessary, to say that he was of course ignorant of my intention, and I cannot help feeling that he is the only person injured, and that to him my apologies are due.

Richard W. Giles.

Clifton, April 8*th*, 1872.

* See letter in Journal, some time in August, 1871.

Sir,—Some of my pharmaceutical friends have done me the honour to think me worthy to represent them on the Council of the Pharmaceutical Society, and have nominated me for the ensuing election.

It is fresh in my memory that rather grave complaints have been uttered against the action of some of our representatives, founded upon a supposed inconsistency between their acts when members of the Council and the views they were understood to hold before election. This impression may possibly have arisen from imperfect knowledge of what those views really were, and the contingency points at once to the desirability of some public expression of opinion on the part of those to whose management the important interests of the whole trade are about to be entrusted.

The Executive of the Pharmaceutical Society now wields an important power, for the proper exercise of which every member of the constituency is in part responsible. It is his duty to test to the utmost of his ability the qualifications of the candidate, and to observe their conduct when elected as representatives.

Equally, as it seems to me, it is right that all candidates should frankly express their views upon moot points of pharmaceutical politics, and that the proceedings of the chosen ones should be made as public as possible. At any rate I will endeavour to render misapprehension about myself impossible. Personally, I have no craving whatever for the honour of a seat at the Council-board; but I am most anxious that certain opinions which I hold, and which I believe to be held by a large majority of our body, should be represented.

Now the point upon which there is still the strongest reason to desire that the constituency and its representatives should be all at one is—"Shall regulations for the storage of poisons be compulsorily enforced upon the trade or not?" Until this question is definitely settled, pharmaceutical progress runs the risk of being much interrupted. I, therefore, devoutly hope that as far as the expression of opinion on the part of members of the Pharmaceutical Society can determine the matter, it may be disposed of at the coming election.

On this topic, then, I wish to say plainly that I oppose *in toto* any further legislative interference in the internal management of our shops. The law already protects the public against the ignorant and careless *public*, by providing that all purchases of poisons shall be attended with certain precautions. It also protects the public against ignorant and careless *pharmacists*: against the ignorant by requiring that all who practise pharmacy shall be *not* ignorant, and against the careless by providing a list of pains and penalties to follow any serious breach of care.

If a few officials desire to impose more than this upon the members of the trade, I deem it to be only consistent with common self-respect, that we not only abstain from helping them, but that we protest against their action and oppose it.

Such, in a few words, are my views upon this subject. There are other topics upon which I am tempted to enlarge—notably, the very important one of education, but for the reason already advanced, I prefer, if possible, to take a note upon the issue just indicated. I, therefore, ask each voter to be good enough to waive for the moment every other feeling for myself he may happen to entertain, and, if these ideas are distasteful to him, to oppose my election by all legitimate means. If, on the other hand, they commend themselves to his judgment as right, then, not only do I ask him to vote for me, but I also ask for his active help in support of all candidates of similar views.

G. H. Schacht.

Clifton, April 6*th*, 1872.

Sir,—As fast as time moves, chemists are qualifying themselves for their high responsibilities and improved status. They have only to beware of the well-meant but fatally short-sighted policy which would make children of them in their adolescence.

Help me to give a hint to the gentlemen who are aspiring to seats in the Council. Let them, through you or otherwise, make known their sentiments as to further compulsory regulations. If those who are opposed to gratuitous degradation will plainly say so, the hearty support of hosts of unknown friends will, I venture to predict, emphatically assure them they are in the right.

T. Mayhew.

Glastonbury, April 9th, 1872.

Exemption from Jury and other Service.

Sir,—I am much gratified to learn, from your report of the meeting of the Council of the Pharmaceutical Society on the 3rd instant, that steps are about to be taken to obtain for registered chemists and druggists the same privilege of exemption from jury service as has for some years past been possessed by pharmaceutical chemists.

Permit me to invite the attention of the Council, and especially of the Parliamentary Committee entrusted with this matter, to the fact that there are other services, quite as objectionable from a professional point of view as jury service, which chemists are sometimes called upon to render, and from which pharmaceutists are not exempt; to wit, service as special constables, parish overseers, ward assessors, etc.

Would it not be practicable to include exemption from all these duties in the representation which, in accordance with the resolution moved by Mr. Bottle, is to be made to the Attorney-General?

I speak feelingly upon this subject, having been compelled in 1870 to be sworn in a special constable; and on two succeeding occasions I have been called upon to appear before the magistrate, on the nomination of the Vestry, as a fit and proper person to fill the office of overseer of the poor of the borough of Oldham. I need scarcely say that these duties require the devotion of considerable time for their proper fulfilment, and, in the case of chemists and pharmaceutists appointed to the services, consequent absence from the duties of their highly responsible calling.

W. Bagshaw.

Oldham, April 8th, 1872.

The Council and Provincial Education.

Sir,—It has been most delightful to notice the full report of the last Council Meeting, given in the Journal, which is, I venture to state, a step in the right direction, and a step which cannot but commend itself to all who are interested in the doings of the Council, whether electors or mere readers of your Journal.

The hearts of provincials have been gladdened, too, to observe the decision come to relative to provincial educational grants. How is it, Sir, that this decision should have been arrived at at so close on to the annual election? Surely our provincials will now be emboldened to speak out at the annual meeting, as well to commend this late decision as to urge its being carried out by the incoming Council in a liberal spirit.

Being well acquainted with the Sheffield Association (to which allusion is made at the Council Meeting), allow me to remark upon the words which are reported to have fallen from the lips of Mr. Sandford relative to a paragraph in their annual report—words which I should not cared to have noticed (as the utterance of one who appears to be piqued when there is anything of provincial interest), except that it would seem to lead your readers to think that the Sheffield Association is a failure as an educational institution. The Council, in the report alluded to, were sufficiently honest, to state that "there was a marked lukewarmness on the part of the apprentices to avail themselves of the advantages offered them," and Mr. Sandford adds, in his superciliousness, "The Council ought not to encourage that lukewarmness, or assist people who did not endeavour to assist themselves." Now, Sir, how is that applicable to an association which, in that very report to which allusion is made, shows in the balance-sheet a gross expenditure of £30 during the year for educational purposes, and a net loss of over £15. It is for him to show how lukewarmness could be encouraged by a grant made for educational purposes to such an association. The paragraph Mr. Sandford alluded to had reference to 1871 as compared with 1870; and as your readers will call to mind that 1870 was affected by extraordinary circumstances, that year could not be taken with fairness as a criterion for following years. The report implies as much when it relates a "falling off." The truth is, Sir, the Sheffield Association is most active, and has shown its vitality by the unparalleled efforts that it has made for educating the apprentices and assistants, which efforts have been crowned with success, as previous reports appearing in the Journal amply show. The average attendance at their lectures and classes during 1871 would bear favourable comparison even with the attendance at Bloomsbury Square, or with other provincial schools.

Let us hope that the initiative taken during the dying hours of the present Council may be followed up by the new Council, so that their electors may judge whether they be true representatives or no.

J. P.

W. H. R.—Mucilage of Tragacanth made into a paste with equal parts of glycerine and water. (2.) See a discussion on the subject at one of the evening meetings, 3rd ser. vol. I. p. 371. We believe the use of ether is now generally discontinued.

M. P. S.—A reference to the transactions printed in last week's Journal will show that the Council are taking action in the matter.

R. S. B.—A heavy hydrocarbon oil answers well.

A. B. C.—(1.) Syrupus Sarsæ. (2). Syrupus Hemidesmi.

W. Laugher.—(1). See the article on p. 829. (2). It is customary to use the genitive, q.s. [*quantum sufficit*] being understood. (3). The Pharmaceutical Journal and the 'Year Book of Pharmacy.'

"*Medicus.*"—We are unaware of the composition of the proprietary medicine referred to.

C. Marshall.—See Sutton's 'Volumetric Analysis,' Wanklyn and Chapman's 'Water Analysis,' and the article on water in Watts's 'Dictionary of Chemistry.'

"*Studens.*"—You will find instructions for the preparation of plants for an herbarium in most elementary botanical works.

A Registered Student of the Society.—(1 and 2.) A pamphlet containing some information on the subject has been forwarded to you by post. (3.) A methodical arrangement would probably be advantageous. (4, 5, and 6.) The conditions in relation to the Botanical Prize are printed in the Journal for March 2nd, p. 710.

J. Wright.—A formula for syrup of lacto-phosphate of lime will be found at p. 3 of the present volume.

W. B. Clark.—The apparent absurdity in the Preliminary Examination question referred to by you, is evidently due to a misplacing of the punctuation.

A. P. S.—A formula for Easton's syrup was given in the first volume of the present series, p. 419: see also other details on pp. 377 and 397. A formula for Dr. Coffin's Composition Powder will be found on p. 457 of the same volume.

B. C. Clarke.—The journal was printed on the 27th, the date of your letter. Reports of Meetings should be sent addressed to the Editor.

F. C. Treadgold and X.—We cannot undertake to recommend particular manufacturers. A list of some of the makers of apparatus will be found, 3rd series, vol. i. p. 480.

J. H. Henry.—You will find the information you require in Fresenius's 'Qualitative Analysis.' or, in fact, in any systematic manual of chemistry.

Communications, Letters, etc., have been received from Mr. J. R. Jackson, Mr. Frazer, Mr. G. C. Druce, Mr. Bagshot, Mr. Rimmington, Mr. Laugher, Mr. C. Marshall, Mr. Wilson, Mr. Richards, "Pharmacist," "Chemicus."

W. B. and "Dixie" have not complied with the regulations as to anonymous communications.

THE MICROSCOPE IN PHARMACY.

BY HENRY POCKLINGTON.

(Continued from page 822.)

(Continued from page 822.)

ADULTERATIONS OF, OR WITH, PRODUCTS OF UNDERGROUND STEMS.

RHEI RADIX.—The structure of the root of the English rhubarb is the easiest to make out.

Medulla.—Absent or indistinguishable, the centre of the root being chiefly occupied by a system of dotted vessels.

Middle zone.—Parenchyma, large, irregular, thin-walled cells, contour of transverse section sinuous, and containing great quantities of compound starch granules. The compound granule is somewhat oval, and comprises usually four granules, each with a distinct hilum, and giving a very distinct cross with polarized light; the size of the granules is tolerably uniform in any given sample, but varies over a few specimens from the same locality very considerably. Certain special cells contain large aggregate crystals of oxalate of lime (?). The colouring matter and active principle are contained in specialized cells, which radiate from the centre outwards, and do not seem to have any immediate connection with the somewhat limited and very irregularly distributed vascular system of dotted vessels.

The structure of Continental rhubarb is closely similar to that of English grown, the chief difference being in the relative proportions of starch, crystals and receptacula. The differences between the true B. P. rhubarb are in degree rather than in kind.

The old-fashioned Turkey rhubarb is remarkable for its paucity of starch, the quantity of crystals, the distribution, size, and individuality of its receptacula.

Indian rhubarb differs from the Turkey in having fewer, often very few, crystals, a *little* more starch, and fewer but larger receptacula. As "Turkey" of the old school is not procurable, the tug of war chiefly lies between the true tropical varieties and the inferior home or European grown ones.

In the lump the several kinds can be easily distinguished. In examining the powder the chief questions to be asked are,—Are the starch granules numerous in proportion to the rest of the powder; if so, are they clearly those of rhubarb? Are the colouring matter receptacula in a fair proportion to the particles of fibre, starch and other granules? If so, are they well formed but somewhat irregular, moderately-sized single cells, or at most a few attached together; or are they (English and European of bad quality) in somewhat long, poverty-stricken vessels? The size and number of the crystals is a character of some diagnostic importance; but it must not be forgotten that English-grown rhubarb often contains an extraordinary quantity of very large crystals, much more, in fact, than even the old Turkey. To sum up. The receptacula in the true B. P. rhubarbs are well-formed, individualized cells of moderate size; in English and poor European samples are thin, narrow vessels. The raphides in the true are smaller and more elegant crystals, and are not so numerous as in English. Starch forms a small proportion in the true, a large proportion in the false; the proportion of starch is by far the most important diagnostic characteristic.

Oleum anisi forms the best medium in which to immerse the sections of rhubarb root for examination, and also for the examination of pulvis rhei. If the operator can succeed in keeping it in, the same medium will answer well for the preservation of his specimens; but, although dammar has answered well so far, I have doubts whether any of the ordinary cements can be depended upon for a permanent luting with this medium. On account of its high index of refraction and low dispersive power, it is invaluable in the examination of certain objects. English rhubarb treated with it and magnesiæ carb. levis, strikes an intense rose red, these act apparently either upon some matter contained within the investing membrane of the starch granule, or upon something contained within the starch-bearing cells. This reaction is rather slow, but is of considerable service. The most common adulterant of pulv. rhei is, of course, the substitution of the powder of English grown for that of the foreign. Other adulterants are,—Starches, turmeric, woody fibres and mineral matter, all of which I have frequently found. They are, of course, easily recognizable under the microscope, as would be the substitution of other roots in powder in company with potato starch and turmeric, which a friend tells me he has come across, but which I certainly have not found, although I have found samples in which the rhubarb, or the useful part of it, was in a very small minority, and that English.

IPECACUANHA RADIX.—The microscopical characters are quite as strongly marked as the botanical ones. The stem may be divided into two zones, the outer and the inner.

Inner zone.—This may be regarded as the woody zone, the *medulla* being absent. Woody fibres long in proportion to their length, large central cavities filled with starch corpuscles; walls of wood cells much pitted; pits small and irregularly distributed. In transverse section these fibres appear as angular starch-bearing cells. Starch granules compound, 2, 4, 6, and even more; each with distinct hilum, and giving a decided black cross with polarized light. Size of granule very variable. Aggregated granule muller-shaped and very variable.

Outer zone.—Cells much larger, more angular, and contain great quantities of starch and some acicular raphides; the latter being very doubly refractive. The structure of the external investing membrane is not characteristic. The characteristics to be sought in the powdered root are, the *starch-bearing* wood-cells, a very infrequent occurrence in other roots, the acicular raphides, and the peculiarly large numbers of starch granules aggregated into one starch granule. This point will distinguish them from those of maize, to which they are otherwise somewhat allied. Of the adulterants, chalk may be detected by adding a drop of acid at the edge of the thin cover whilst the powder is under observation, starches in the usual way, woody fibres by their not containing starch, or by the absence of the peculiar "pitting" of ipecacuanha wood-cells.

The structure of "striated ipecacuanha" requires study, but must be postponed for consideration in a future paper.

(To be continued.)

Chapters for Students.

CHEMICAL NOTES TO THE PHARMACOPŒIA.

BY WILLIAM A. TILDEN, D.SC. LOND.
DEMONSTRATOR OF PRACTICAL CHEMISTRY TO THE PHARMACEUTICAL SOCIETY.

SODÆ NITRAS, $NaNO_3$.—[§ A native salt, purified by crystallization from water.] Imported in large quantity from Peru and Chili. It is sometimes called cubic nitre, but the crystals are obtuse rhombohedra, of the same form as calc-spar. It gives the usual reactions of nitrates. [See ACIDUM NITRICUM.] It should be free from chloride and sulphate, and, therefore, give no precipitate with nitrate of silver and chloride of barium. Chloride especially should not be present in any notable proportion, or nitric acid prepared from the salt will be contaminated with hydrochloric acid.

SODÆ PHOSPHAS, $Na_2HPO_4 . 12H_2O$.—Bone-ash is digested with sulphuric acid, and the soluble superphosphate which is formed, separated from the sulphate by treating the mass with water.

$$Ca_3(PO_4)_2 + 2H_2SO_4 = CaH_4(PO_4)_2 + 2CaSO_4.$$

The liquid is filtered off, evaporated, and left at rest to deposit sulphate of calcium. It is then boiled with carbonate of sodium till the precipitate ceases to form, and the liquid has acquired a feeble alkaline reaction.

$$CaH_4(PO_4)_2 + Na_2CO_3 = CaHPO_4 + Na_2HPO_4 + CO_2 + H_2O.$$

The precipitated mono-calcic phosphate is filtered off, and the sodium salt crystallized from the filtrate.

[§ In transparent colourless rhombic prisms, terminated by four converging planes, efflorescent.]

Phosphate of sodium crystallizes in another form with seven molecules of water. These two compounds are isomorphous with the corresponding arseniates. [§ Its solution has a faintly alkaline reaction; it gives a yellow precipitate with nitrate of silver, the resulting fluid acquiring an acid reaction.]

$$Na_2HPO_4 + 3AgNO_3 = Ag_3PO_4 + 2NaNO_3 + HNO_3.$$

[§ Heated to dull redness it loses 63 per cent. of its weight, leaving a residue which, when dissolved in water, gives with chloride of barium a precipitate almost entirely soluble in diluted nitric acid.]

$$\underset{\text{Disodic Ortho-phosphate.}}{2[Na_2HPO_4]} - H_2O = \underset{\text{Pyrophosphate.}}{Na_4P_2O_7}.$$

[See also ACIDUM PHOSPHORICUM.]

SODÆ SULPHAS, $Na_2SO_4 10H_2O$.—[May be obtained from the residue left in the manufacture of hydrochloric acid by neutralizing it with carbonate of soda, and crystallizing from solution in water.]

$$\underset{\text{Acid Sulphate of Sodium.}}{2[NaHSO_4]} + \underset{\text{Carbonate of Sodium.}}{Na_2CO_3}$$
$$= \underset{\text{Sulphate of Sodium.}}{2[Na_2SO_4]} + \underset{\text{Carbonic Acid.}}{H_2O . CO_2}.$$

[§ In transparent oblique prisms, has a salt and bitter taste; effloresces on exposure to the air; soluble in water, insoluble in spirit. Exposed to heat in a porcelain crucible, it loses 55·9 per cent. of water.]

$Na_2SO_4 10H_2O (=322)$ loses $10\ H_2O (=180)$
and 322 : 180 : : 100 : 55·9.

[§ Heated with solution of potash, no odour of ammonia is evolved, and no precipitate is formed.] Sulphate of ammonium and iron salts are thus shown to be absent. [§ 50 grains (=3·240 grams) of it dissolved in distilled water, and acidulated with hydrochloric acid, give by the addition of chloride of barium a white precipitate, which, when it has been washed and dried, weighs 36·18 grains (=2·344 grams).]*

$$\underset{\substack{\text{Sulphate of Sodium.}\\ 322}}{Na_2SO_4 . 10H_2O} + BaCl_2$$
$$= \underset{\substack{\text{Sulphate of Barium.}\\ 233}}{BaSO_4} + 10H_2O + 2NaCl$$

322 : 233 : : 50 : 36·18
or 3·24 : 2·344

SODÆ VALERIANAS. $NaC_5H_9O_2$.

The Pharmacopœia directs fusel oil to be distilled with a solution of bichromate of potassium mixed with sulphuric acid, and the valerianic acid which collects in the receiver to be neutralized by solution of soda.

The reaction which takes place when amylic alcohol is submitted to oxidation has already been adverted to (ALCOHOL AMYLICUM), and some objections to the use of crude fusel oil pointed out. When pure amylic alcohol is used, and chromic acid the oxidant employed, the changes which occur are shown in the following equations:—

$$\underset{\text{Red Chromate of Potassium and Sulphuric Acid.}}{2\left\{\begin{matrix}K_2Cr_2O_7\\4\ H_2SO_4\end{matrix}\right\}} + \underset{\text{Amylic Alcohol.}}{3\ [C_5H_{11}HO]}$$
$$= \underset{\text{Potassio-chromic sulphate and Water.}}{2\left\{\begin{matrix}K_2Cr_2(SO_4)_4\\4\ H_2O\end{matrix}\right\}} + \underset{\text{Valerianic Acid.}}{3\ [C_5H_9OHO]}$$

The nascent valerianic acid acts on a portion of the amylic alcohol as yet unattacked, and converts it into a compound ether, the amyl valerate.

$$\underset{\text{Amylic Alcohol.}}{C_5H_{11}HO} + \underset{\text{Valeric Acid.}}{C_5H_9OHO}$$
$$= \underset{\text{Valerate of Amyl.}}{C_5H_9OC_5H_{11}O} + \underset{\text{Water.}}{H_2O}.$$

This is afterwards decomposed, when the distillate is neutralized by soda—

$$\underset{\text{Valeric Acid.}}{C_5H_9OHO} + \underset{\text{Sodium Hydrate.}}{NaHO}$$
$$= \underset{\text{Valerate of Sodium.}}{C_5H_9ONaO} + \underset{\text{Water.}}{H_2O}$$
$$\underset{\text{Valerate of Amyl.}}{C_5H_9OC_5H_{11}O} + \underset{\text{Sodium Hydrate.}}{NaHO}$$
$$= \underset{\text{Valerate of Sodium.}}{C_5H_9ONaO} + \underset{\text{Amylic Alcohol.}}{C_5H_{11}HO}.$$

[§ In dry white masses without alkaline reaction, entirely soluble in rectified spirit, and giving out a powerful odour of valerian on the addition of diluted sulphuric acid.]

These compounds derive their name from that of the *Valeriana officinalis*, from which plant the acid was originally obtained. The odour of the plant is, however, very different from that of valerianic acid,

* The number 72·2 in the B.P. is a mistake.

and is agreeable when fresh. It is due, in part, to a crystallizable body called valerol, $C_6H_{10}O$, by the oxidation of which the valerianic acid derived from the plant is formed.

$$\underset{\text{Valerol.}}{2\,C_6H_{10}O} + 3\,O_2$$
$$= \underset{\text{Valerianic Acid.}}{2\,C_5H_{10}O_2} + \underset{\text{Carbonic Anhydride.}}{2\,CO_2}$$

(*To be continued.*)

PEPSIN.

A NEW PRACTICAL METHOD TO PREPARE IT; ITS PROPERTIES AND DIGESTIVE STRENGTH.

BY E. SCHEFFER.

(*Concluded from page* 785.)

Relation of Chloride of Sodium to the Digestive power of Pepsin.—By its preparation the commercial saccharated pepsin contains always a small quantity of chloride of sodium; in my experiment, to obtain a pure pepsin free of sodium chloride, I succeeded by using alcohol, but the resulting product had less digestive power than purified pepsin, which still contained salt. It was therefore interesting to determine if chloride of sodium would aid the action of pepsin on albumen and accelerate its solution.

A very small quantity of salt, a quantity that does not exceed much that of the purified pepsin, does not interfere with, on the contrary assists, the pepsin in its action; but a larger quantity, although very small in itself, retards the solvent power.

While half a grain of pure pepsin in 2 oz. of acidulated water dissolved 200 grs. of coagulated albumen perfectly, a great deal of albumen was left undissolved in the same time when 5 grs. of salt were added to it, while by 10 grs. of salt a portion of the albumen was not dissolved after three days.

Stability of Pepsin.—As watery solutions of pepsin decompose very soon, particularly in warm weather, it was of interest to determine the stability of acidulated solutions; accordingly solutions containing 1 gr. of purified pepsin to the fluid ounce of water, and respectively 2, 4, 6, 8 and 10 drops of hydrochloric acid were set aside, a portion of each in well-corked vials and another portion in vials only tied up with paper. The solutions containing 2 drops of acid became mouldy after the first and second week, while in the vials with 4 drops of acid I noticed mould after five weeks. The other solutions kept entirely clear, and when examined after six months they did not have any bad odour, but had lost their digestive power almost entirely; albumen, put into several of the solutions, was hardly acted upon, and chloride of sodium did not produce the characteristic precipitate.

To 20 grs. of purified pepsin, swelled in 2 oz. of water, were added 10 drops of hydrochloric acid, which dissolved the pepsin fully and formed a liquid of a slight yellowish colour and the consistence of the officinal mucilage of gum arabic. Put aside in a beaker-glass, tied up with blotting-paper, it evaporated slowly, and was, after six weeks, dried out to a transparent gum which felt sticky to the touch. Examined after several months, it dissolved readily in water, forming a clear solution of sour reaction and taste, which had no bad odour, but acidulated and diluted to the strength usually employed in my experiments, did not act on coagulated albumen, and chloride of sodium gave no precipitate. The pepsin was therefore totally destroyed or at least made inactive.

Anxious to learn whether liquid pepsin, which had been put aside eight months before for experiments' sake, had retained its digestive properties, I examined this and found that, although slower in its action it still dissolved albumen, and was also precipitated by chloride of sodium.

It seems, therefore, that the glycerine in the preparation of liquid pepsin prevented the pepsin from decomposing.

In the spring I had set aside moist precipitate (by chloride of sodium) of pepsin of the consistence ready for the press; when examined after six months it had a sweet odour, was pressed, dried, and its digestive power ascertained, whereby it proved to have the same digestive strength as when quite freshly prepared.

Several times the (chloride of sodium) precipitate, while draining on the cloth, was entirely frozen through, but proved, after thawing, not inferior in quality.

The purified as well as the saccharated pepsin, examined twelve months after preparation, proved to be entirely as good as when recently prepared; they had lost nothing of their strength, and dissolved albumen in the same time and in the same quantities as when quite fresh. The only difference is, that with age the dry pepsin dissolves somewhat slower in acidulated water.

Action of Pepsin on Milk.—As the opinion is still prevalent, even amongst physicians, that only calf rennet has the property of separating the casein from the milk, or in other words, to coagulate milk, it was interesting to me to try the action of pepsin on milk.

Five grains of saccharated pepsin, swelled in a little water and then stirred into 1 pint of milk, coagulated the milk in thirty minutes.

Of a solution of 2 grs. of purified pepsin, two drops of hydrochloric acid and one fluid ounce of water, it took 5 drops to coagulate 4 oz. of milk in about twenty to thirty minutes; while 10 drops of dilute muriatic acid (20 drops to 1 oz. of water) did not curdle 4 oz. of milk in four hours.

Averaging 400 drops in a fluid ounce of the pepsin solution, it took one-fortieth ($\frac{1}{40}$) part of 1 gr. to coagulate 4 oz. of milk, or 1 gr. to 5 quarts; according to this test, 1 part of pepsin will coagulate about 80,000 (eighty thousand) parts of milk.

The success of these experiments depends a great deal on the temperature; the best way is to add the pepsin to the milk when cold and then heat it slowly; when kept cold it takes much longer time to coagulate the milk. Also when the milk is heated first, say to 100° F., before the pepsin is added, it takes three to four times as much pepsin to effect coagulation.

Alcohol incompatible with Pepsin.—In my former articles written about pepsin, I have mentioned the incompatibility of pepsin and alcohol, and have spoken of the impropriety of dispensing pepsin in the form of wine or elixir. Having now a purer pepsin at my disposal than before, I repeated the experiments with entirely the same result.

Seven vials of solution of pepsin, each containing the same amount of pepsin and hydrochloric acid, were made with that difference, that, while vial No. 1 contained only 1 fluid ounce of water; No. 2 contained $\frac{1}{2}$ drachm of alcohol and $7\frac{1}{2}$ drachms of water; No. 3, 1 drachm of alcohol and 7 drachms of water; and so each following vial $\frac{1}{2}$ drachm of alcohol more than the preceding one, so that in vial No. 7 there were 5 drachms of water and 3 drachms of alcohol. The same amount of coagulated albumen was put into each vial, which was exposed then to a temperature of 100° F. After six hours in vial No. 1 all the albumen was dissolved; in No. 2 some albumen was left undissolved, No. 3 contained more, and in No. 4 over half of the albumen was not dissolved, while in 5, 6, and 7 the albumen was a little changed in appearance, but the bulk not diminished. The contents of those vials in which the albumen was not much acted upon emitted that peculiar sour odour which characterizes discharges of an overloaded stomach (with beer or wine) by vomiting.

A solution of half a grain of purified pepsin in half a fluid ounce of water, with 3 drops of hydrochloric acid, was mixed with 1 fluid ounce of sherry wine, after twenty-four hours filtered, and then, with the addition of 150 grs. of coagulated albumen, exposed to a temperature of 105° F. After six hours—during which time the half-grain of purified pepsin in acidulated watery solution would have dissolved 250 grs. of coagulated albumen—of the 150 grs. at least two-thirds yet remained. I added now 6 drops more of hydrochloric acid to bring the liquid to my standard acidity, but even at the end of twenty-four hours a large quantity of the albumen was undissolved.

Having never made pepsin by any other method, I am not able nor justified to judge between the different products; but that my process excels by simplicity, nobody will question. That a complicated process, by which strong bodies, as mercury, lead and sulphuretted hydrogen, are alternately used to prepare a substance, should or might impair the quality of the product, is very probable. That pepsin, prepared by such a method, nevertheless has the digestive power, speaks for the almost inexhaustible strength of it.

Another point of importance in my preparation I would call attention to is that no artificial heat at all is used, neither by extracting the stomachs nor by drying the pepsin, and in my whole process no evaporation is necessary. To evaporate the solution of a substance, for which a few degrees difference in heat decide between life and death, is a very delicate operation, which is easily carried out for experimental purposes, but on a larger scale is almost impossible.

My pepsin differs from the pepsin described in Gmelin's 'Handbook,' principally by the latter being easily soluble in water, while mine, although very soluble in the moist state, loses its solubility almost entirely by exsiccation.

The pepsin precipitate which, combined with pepton, I obtained from the pepton solution, is more identical with the pepsin described in Gmelin's 'Handbook' (vol. viii. Zoochemie), as it is easily soluble after having become dry, is completely precipitated by alcohol, shows a more acid reaction, and its clear solution becomes more turbid by addition of hydrochloric acid than the pure pepsin.

To bring the pepsin into a finely divided state, I preferred the use of milk sugar to that of starch, the substance generally used for this purpose, particularly by the French manufacturers; reasoning that sugar, with its antiseptic properties, will contribute to the stability of it, while starch, particularly in the damp state, is very apt to get mouldy, and will then, as a necessary consequence, cause the decomposition of the pepsin.

When first making the commercial pepsin, which I called saccharated pepsin, I aimed to make it of such strength that 1 gr. of the saccharated should correspond in its digestive power to one teaspoonful of the liquid pepsin (*American Journal of Pharmacy*, January, 1871); that it can be made of much greater power I have plainly shown by the before-mentioned results.

As for the precise strength that will be best suited for the human stomach, that will have to be determined by physiologists. According to Schroeder, the normal gastric juice of man dissolves 24 per cent. of coagulated albumen; five grains of saccharated pepsin, which in acidulated solution dissolve 60 grs. of coagulated albumen in four to six hours, would correspond to half an ounce of human gastric juice. No doubt the beneficial effect of pepsin has its limits. Several grains of the purified pepsin, of which 1 gr. dissolves 500 grs. of albumen in six hours, might do more harm in the human stomach than good, and might even do positive injury.

But, in this essay, I have given only facts based on chemical experiments; to make use of these facts for therapeutical and physiological purposes, I leave to physicians.—*Amer. Journ. of Pharmacy.*

BISULPHITE OF MAGNESIA.

ITS PREPARATION AND COMPOSITION.

BY GEO. ARCHBOLD, D.SC.

Though the salts of sulphurous acid are well known, yet much diversity of opinion exists as to their real composition, and Mr. Carteighe truly remarked that not many bisulphites have been carefully analysed in a pure state. It is not my intention in this paper to refer to all these salts, but simply to the one which has already been the subject of discussion; namely, bisulphite of magnesia. If we pass a current of sulphurous anhydride through a mixture of magnesia carbonate and distilled water, until the mixture is perfectly clear and has an acid reaction, on being carefully concentrated, it yields crystals of bisulphite of magnesia, as it cools, in the form of depressed tetrahedrons, which on analysis give the chemical formula of $Mg\,2SO_3\,6H_2O$. The salt tastes earthy and also slightly of sulphurous acid. On exposure to the air, the crystals slowly become opaque and change into sulphate; they are soluble in twenty parts of distilled water at 15·5° C., more so in boiling water, but crystallize on cooling. In order to ascertain the real percentage of sulphurous anhydride in this salt and see whether it was a bisulphite, I proceeded as follows:—

I. 100 grs. of the crystals prepared as above was pulverized and mixed with four times its weight of potassic nitrate, and a small quantity of the nitrate further laid upon the mixed salts. The whole was gradually heated in a porcelain crucible until it began to fuse, the sulphurous acid thereby being transformed into sulphuric, under disengagement of nitrous acid. The mass when cooled was dissolved in distilled water, supersaturated with HCl, and the sulphuric acid then precipitated with chloride of barium solution. The precipitated sulphate of barium when washed and dried indicated 55 grs. anhydrous sulphurous acid.

II. 100 grs. of the salt dissolved, and tested with P.B. vol. sol. iodine, indicated almost the same. The salt crystallizes with 6 molecules of water, the whole of which is given off at 100° C. The crystals prepared as above and dried in the air or over sulphuric acid give the formula of

$$Mg'' 2SO_3' 6H_2O.$$

and at 100° C., $Mg\ 2SO_3$.

Thus theory would give a percentage of 54·7 of anhydride, while analysis gives 55 in the crystals.

THE PREPARATION OF CHRYSAMMIC ACID AND CHRYSAMMATES.

BY WILLIAM A. TILDEN, D.SC. LOND.

These beautiful compounds are usually prepared from aloes, but the soluble extractive matters which constitute at least half of the crude drug, yield little but picric and oxalic acids, and the resinoid gives a mere trifle of chrysammic acid.

I find it preferable, therefore, to employ for the manufacture of aloetic and chrysammic acids the aloin of Barbadoes aloes, which, since the discovery of Flückiger's 'nataloin' would be appropriately named *barbaloin.* The following is an outline of the process I adopt. Fine Barbadoes aloes must be selected; and the variety which has a rich brown, not dark, colour and powerful odour, yields the best result. One part of such aloes is dissolved by agitation with seven or eight parts of boiling water, slightly acidulated with hydrochloric acid. The solution is allowed to cool and to remain at rest for twenty-four hours, when it may be strained to remove the deposited resin. It is then evaporated down in an open dish till a syrupy consistence is attained, and there remains rather less than two parts of liquid. This, set aside for a day or two, solidifies in consequence of the formation of a mass of granular crystals. The whole is drained in a calico bag, and then submitted to gradually increasing pressure till entirely free from the black mother-liquor. In this way a lemon-yellow mass of barbaloin results, which amounts to from 20 to 25 per cent. of the aloes if a proper selection has been made. To render it quite pure, it requires one or two crystallizations from rectified spirit, but for the preparation of chrysammic acid this is unnecessary. It has only to be dried and powdered and introduced in small portions into about six times its weight of fuming nitric acid (sp. g. 1·45), kept cool. After standing a few hours, about half its volume of water is added and heat applied until, in consequence of the formation of deposit, the liquid bumps. During this digestion, a considerable quantity of carbonic anhydride escapes with the nitrous fumes. A further quantity of water is then added, and when cold the bright yellow crystalline deposit of aloetic and chrysammic acids filtered off. The liquid retains oxalic and picric acids, together with a small quantity of aloetic acid, which may be recovered by distilling away the nitric acid and washing the residue with water. The mixture of aloetic and chrysammic acids thus obtained is dried and boiled gently for eight or ten hours with sufficient nitric acid to cover it. Water is again added, and the crystalline precipitate collected and washed till the washings become pink. It is then boiled for an hour with about an equal weight of potassic acetate dissolved in fifty parts of water. The solution thus obtained deposits on standing a copious crystallization of green sparkling potassic chrysammate, which may be washed with a little cold water. The mother-liquors, which retain potassic aloetate, are evaporated down, acidified by nitric acid, and the aloetic acid converted into chrysammic acid by further treatment with nitric acid, as already described.

Proceeding in this way, barbaloin readily yields more than a third of its weight of pure potassic chrysammate.

Chrysammic Acid.—Crystals of chrysammic acid are best obtained by dissolving potassic chrysammate in a considerable quantity of boiling water, and strongly acidifying the liquid with acetic acid. Thin yellow fern-leaves, a quarter of an inch long, mixed with a few long red crystals, are deposited in a few hours. On warming the whole gently, the latter are redissolved, and the yellow fern leaves which are mixed with a few much smaller tables may be filtered off and washed. They consist of pure chrysammic acid; in mass they strongly resemble picric acid, but are more lustrous.

After exposure to dry air at ordinary temperatures for a few days, they suffer no loss of weight by heating to 150° C. Evaporated with pure sulphuric acid, they leave no residue.

Lead Chrysammate. Described by Schunck and Mulder as a red powder containing variable proportions of lead. It may easily be obtained, however, beautifully crystallized, by mixing a boiling solution of potassic chrysammate with a slight excess of plumbic acetate dissolved in boiling water and acidified with acetic acid. On cooling, long thin prisms, exhibiting a magnificent bronze reflection, are formed. The light transmitted by the crystals is pale red and strongly polarized, so that on viewing, by means of a lens, some of them suspended in the mother-liquor, the light is seen to be completely cut off, when two of them cross each other at right angles. Mounted properly, they form a pretty microscopic object.

The salt was found to have the formula $C_{14}H_2 Pb''(NO_2)_4O_4 . 4H_2O$.

	Theory.	Experiment.
H_2O	10·33	10·18
Pb	29·69	28·9[illegible]

Barium Chrysammate. Hitherto described as a red powder. Obtained in the crystalline form by mixing boiling solutions of potassic chrysammate and barium chloride acidified with acetic acid. It appears to be one of the most insoluble of the chrysammates, as the mother-liquors left after the crystallization of the salt are almost colourless. It forms brown shining needles, which, however present none of the green or golden lustre so noticeable in most of the other salts.

The formula seems to be the same as that assigned by Mulder to the uncrystallized compound, viz. $C_{14}H_2Ba''(NO_2)_4O_4 2H_2O$.

	Theory.	Experiment.
Ba	23·18	22·77

Potassium Chrysammate crystallizes in two forms;

usually as dark red spangles with bright green lustre, or when the salt is crystallized quickly, or from a slightly acid solution, as bright crimson needles with slight golden reflection. The red crystals have the formula $C_{14}H_2K_2(NO_2)_4O_4 \cdot 3H_2O$.

Theory.		Experiment.
H_2O	9·81	9·09

The formulæ used in this paper are double those hitherto employed for chrysammic acid and its compounds, and are in accordance with the view of Graebe and Liebermann, who represent chrysammic acid as a derivative of anthrakinone. On this supposition it must be a dibasic acid, and I have therefore made some attempts to prepare some salts, the constitution of which might help to decide this question. At present, however, I have not been successful in producing acid or double salts, presenting characters such as would entitle them to be pronounced definite compounds.

NOTES ON PAREIRA.

BY EDWARD R. SQUIBB, M.D.

Pareira Brava is a drug which has withstood the mutations of therapeutics and commerce for nearly two hundred years, and it is a singular and significant fact, in view of its commercial history, that it has sustained a sound reputation with many critical observers.

It appears to have been introduced to European practice from Portugal, but its sources were Mexico, tropical South America, and the West Indies. Under a name so indefinite as "Wild Vine," or "Bastard Vine,"—the translation of the name *Pareira Brava*,—it is hardly possible that the markets should have always been supplied from the same plant, even after its botanical source was determined, and hence the varying descriptions of different authorities may be accounted for. The writer has been familiar with it, both in its use and in its market character, for more than twenty-five years, and for the last half of this period supposed he knew the substance with some degree of accuracy, as its appearance was more uniform than that of most drugs. It, however, never had more than a very general agreement with any of the descriptions given of it; and the almost universal testimony of those physicians who knew it best was, that although very efficient in the treatment of chronic diseases of the mucous membranes of the urinary passages, it was only useful when given in doses very much larger than those prescribed by the books.

It has so happened, that in the New York market the trade in this drug has been largely, though not exclusively, confined to one drug house, and its appearance, as met with here, is identical with occasional samples seen from other cities. Some ten years ago, the annual sales did not exceed three or four hundred pounds, and the price was fifteen to twenty cents. A Portuguese merchant, stimulated by this high price, imported a lot of some ten thousand pounds, and unable to sell it except in small lots at the expected prices, stored it for a year or two. This was found to be expensive management of so bulky an article, and the lot was finally sold at eight cents, and supplied the market for years. Another lot of about half as much shared the same fate, and fell into the same hands. The fate of these two lots and the glut of the market seems to have stopped importation entirely, and by 1871, when the annual sales had reached three to four thousand pounds, the supply became exhausted. In resorting to foreign markets it was found scarce, and to be had only in small lots, and these, on arriving here, were sold at seventy-five cents to a dollar a pound. In looking critically through one of these small lots as a purchaser, the writer was surprised to find nearly one-half of it so entirely different from any hitherto seen, that he rejected it, and at once pronounced it a fraudulent adulteration or substitution, made in the interest of the scarcity and high price, and carefully selected out for purchase that only which he had seen before. Some specimens of this supposed fraudulent *Pareira* were, however, taken for examination, and were found to agree well with some of the older descriptions. A plate given by Pomet in his 'History of Drugs,' published in 1737, and a close examination of the structure, etc., convinced the writer that this was the true Pareira root, and that what he had heretofore seen was the stem.

In a critical review of the descriptions of Wood and Bache, and Pareira, these descriptions were found to apply to both, as nearly as such descriptions generally do to foreign drugs, but that they applied much better to the ligneous woody stem, which is comparatively insipid, and probably inert. The root is very much darker, almost black externally, and both the annular and vertical wrinkles are very much larger and more prominent. It occurs in shorter sections than the stem, and gnarled pieces are found eight inches to a foot in diameter. The texture is far less compact than that of the stem, while the beautiful arrangement of the consecutive rings seen in a cross section, which requires a glass in the compact stem, is well seen with the naked eye in the root. The sweetish and afterward bitter taste of the woody stem is very feeble, and even when in the finest powder, it yields very little extract to any menstruum. The taste of the root is, however, very much stronger, and yields at least twice as much extractive matter to the menstrua. Specimens illustrate the difference between the root and stem much better than any description, and will render further explanation unnecessary.

It thus appears that, for some twelve or fifteen years past, this market has been supplied with the comparatively inert stem, instead of the root of Pareira; and that the ideas of at least one careful purchaser had become so fixed upon the intractable woody stems, that when the roots did appear, they were very nearly rejected as a fraudulent substitution. The importations of this year thus far have come from the European markets in small lots, and have been a mixture of root and stem, but less of the root than stem, and the chief object of this note is to attract attention to the drug, and create such a demand for the proper root portion, that after the present scarcity is over, and the market comes to be again supplied direct, the stem may be rejected.

There is no doubt whatever as to the peculiar efficacy and utility of this drug within its legitimate sphere in therapeutics, and the wonder is that it has been able to sustain its well-tried and time-honoured reputation upon the feeble medicinal properties of the stem.—*American Journal of Pharmacy.*

CONTRIBUTIONS TO THE HISTORY OF THE OPIUM ALKALOIDS.*

BY C. R. A. WRIGHT, D.SC.

Lecturer on Chemistry in St. Mary's Hospital Medical School.

PART IV.

1. *On the Action of Hydriodic Acid on Morphia in presence of Phosphorus.*

It has been shown in Part III. of these researches† that when hydriodic acid acts on codeia in presence of phosphorus, a series of products are ultimately obtained which may be considered as formed by the following train of reactions:—

* Read before the Royal Society.

† Proc. Roy. Soc., vol. xx. p. 8; PHARM. JOURN. 3rd ser. vol. ii. p. 485.

$$\underset{\text{Codeia.}}{C_{18}H_{21}NO_3} + HI = CH_3I + \underset{\text{Morphia.}}{C_{17}H_{19}NO_3},$$

$$\underset{\text{Morphia.}}{C_{17}H_{19}NO_3} + 2HI = I_2 + \underset{\text{Hypothetical new base X.}}{C_{17}H_{21}NO_3},$$

$$\underset{\text{Hypothetical new base X.}}{C_{17}H_{21}NO_3} + 2,HI = I_2 + H_2O + \underset{\text{Hypothetical new base Y.}}{C_{17}H_{21}NO_2}.$$

These two hypothetical bases, X and Y, then serve as the foundations of two series of new products expressible by the general formulæ :—

$$4X + nHI \pm pH_2O,$$
$$4Y + nHI \pm pH_2O.$$

In accordance with these views, it might be anticipated that, on treating morphia with hydriodic acid and phosphorus, either the same products, or at least products belonging to these same series, would ultimately result, which is in fact the case.

The morphia used in these experiments was presented for the purpose by Messrs. Macfarlane, of Edinburgh, to whom the writer has already been so much indebted for similar acts of liberality; the hydriodic acid was prepared as described in Part III., and contained 50 to 55 per cent. of HI.

On dissolving morphia by the aid of heat in about four times its weight of this acid, a marked brown colouration is visible, indicating the separation of iodine; on adding phosphorus and continuing to heat, this colour ultimately disappears, a colourless syrupy liquid being obtained, which is freed from amorphous phosphorus and the phosphorous acids produced during the reaction by filtration though asbestos while hot, precipitation by water, etc., precisely as in the case of the similar codeia products. On then treating codeia, one or other of three products appear to be formed, according to the temperature employed, viz. :—

At 100°	$4X + 6HI$.
At 110°–115° ..	$4X + 6HI - 2H_2O$.
Boiled up to 130° ..	$4Y + 6HI - 2H_2O$.

In the case of morphia, however, the resulting product is the same at whatever of these temperatures the reaction ensues, and has the composition $4X + 6HI$ $2H_2O$. Thus the following numbers were obtained after complete drying at 100° :—

(A.) Digested four hours at 100°.
0·3695 grm. gave 0·5920 CO_2 and 0·1710 H_2O.
0·3325 „ 0·2410 AgI.

(B.) Gently boiled ten minutes.
0·3955 grm. gave 0·6240 CO_2 and 0·1770 H_2O.
0·3465 „ 0·2530 AgI.
0·4420 „ 0·3260 AgI.

(C.) Boiled till the thermometer stood at 132°.
0·3150 grm. gave 0·4990 CO_2 and 0·1400 H_2O.
0·4405 „ 0·3280 AgI.

	Calculated.		Found. A.	B.	C.	Mean.
C_{68} ..	816	43·40	43·69	43·03	43·20	43·31
H_{86} ..	86	4·58	5·14	4·97	4·94	5·02
I_6 ..	762	40·53	39·17	39·46 39·86	40·24	39·68
N_4 ..	56	2·98				
O_{10} ..	160	8·51				
$C_{68}H_{82}I_2N_4O_{10},4HI$	1880	100·00				

Hence this product is formed from morphia in accordance with the equation

$$4C_{17}H_{19}NO_3 + 14HI = 2H_2O + 4I_2 + C_{68}H_{82}I_2N_4O_{10},4HI.$$

In physical properties and qualitative reactions the substance thus got is indistinguishable from the product of the same composition obtained from codeia; like the codeia product, too, it loses the elements of HI on long-continued boiling with water.

II. *Action of Water on the foregoing Compounds.*

When the original substance $C_{68}H_{82}I_2N_4O_{10},4HI$ is boiled for five hours with about three hundred times its weight of water, a liquid is obtained from which white flakes separate on cooling; these have the same curious microscopical structure as the body similarly obtained from codeia, and gave the following numbers after drying at 100° :—

0·3680 grm. gave 0·6220 CO_2 and 0·1770 H_2O.
0·4240 „ 0·7165 CO_2 and 0·2050 H_2O.
0·3780 „ 0·2520 AgI.

	Calculated.		Found.	
C_{68}	816	46·58	46·10	46·09
H_{85}	85	4·85	5·34	5·37
I_5	635	36·24	36·02	
N_4	56	3·20		
O_{10}	160	9·19		
$C_{68}H_{81}IN_4O_{10},4HI$	1760	100·00		

Hence this substance is formed by the reaction

$$C_{68}H_{82}I_2N_4O_{10},4HI = HI + C_{68}H_{81}IN_4O_{10},4HI,$$

identical with that which takes place with the corresponding compound in the codeia series.

When the compound $C_{68}H_{81}IN_4O_{10},4HI$ from codeia is further treated with excess of water and boiled for several hours, a further elimination of the elements of HI has been shown to take place, the end product having the composition $C_{68}H_{80}N_4O_{10},4HI$; as stated in part III., however, it is very difficult to push this reaction to its extreme. Precisely the same facts are observable with the above morphia product; by boiling this with three hundred times its weight of water for three hours, half the basic iodine it contains is eliminated as HI, forming a product which may be either a mixture of equivalent quantities of $C_{68}H_{81}IN_4O_{10}.4HI$ and $C_{68}H_{80}N_4O_{10}.4HI$, or a single substance of the formula $C_{136}H_{161}IN_8O_{20},8HI$. If this latter be the case, the formulæ hitherto attributed to the derivatives from codeia and morphia obtained by the action of HI are only half the true ones; and the formation of this substance may be expressed by the equations

$$C_{136}H_{164}I_4N_8O_{20},8HI = 2HI + C_{136}H_{162}I_2N_8O_{20},8HI,$$
$$C_{136}H_{162}I_2N_8O_{20},8HI = HI + C_{136}H_{161}IN_8O_{20},8HI.$$

The following considerations tend to show that this body is a single substance and not a mixture :—

1st. By treating the compound hitherto described as $C_{68}H_{81}IN_4O_{10},4HI$ from codeia with water, a body which has the composition of $C_{136}H_{161}IN_8O_{20},8HI$ is produced previously to the production of the substance hitherto described as $C_{68}H_{80}N_4O_{10},4HI$. Now it is not probable that in two separate instances *one* compound should split up into mixtures of *two* bodies of analogous though slightly different constitutions, these two being formed in each case in *equivalent quantities.*

2nd. A body which is without doubt a single compound, and which has the formula $C_{136}H_{153}IN_8O_{20},8HI$, has been produced (as will be described in a subsequent communication) by the simultaneous action of HI and P on a polyamide of codeia obtained from that base by the action of phosphoric acid; in physical and chemical properties this product much resembles the two bodies thus obtained from morphia and codeia products by the action of water; and hence these two bodies probably contain, like it, C_{136} associated with I in the base.

In order to show the resemblance between, or rather the identity of, the codeia and morphia products, the formulæ given in Part III. have been adopted in this paper (viz., those containing C_{68}); but the author has no doubt that each of the substances has really double the formula ascribed to it (*i.e.* that each contains C_{136}).

The substances of compositions $C_{136}H_{161}IN_8O_{20},8HI$ obtained as above-mentioned from codeia and morphia products by the continued action of water gave the following numbers on analysis after drying at 100°:—

A. Codeia product—
0·3985 grm. gave 0·7050 CO_2 and 0·200 H_2O.
0·3670 „ 0·2280 AgI.

B. Morphia product—
0·3120 grm. gave 0·5635 CO_2 and 0·1610 H_2O.
0.3140 „ 0·5560 CO_2 and 0·1570 H_2O.
0·2840 „ 0·1775 AgI.

	Calculated.		Found. A.	Found. B.	
C_{135}	1632	48·34	48·25	48·17	48·29
H_{160}	169	5·01	5.55	5·61	5·55
I_9	1143	33·86	33·57	33·77	
N_8	112	3·31			
O_{20}	320	9·48			
	3376	100·00			

$C_{136}H_{161}IN_8O_{20},8HI$

In physical character and chemical deportment the derivatives from morphia obtained as above described are indistinguishable from those of the same composition obtained from codeia. The physiological experiments of Mr. Stocker, given in the next section, show that no particular difference is discernible in this respect also; hence it is concluded that the codeia products are not merely isomeric, but are identical with the corresponding morphia derivatives.

From the fact that hydriodic acid alone does not eliminate methyl from codeia in the form of methyl iodide, but causes the separation of free iodine, it appears more probable that the formation of the compound $C_{68}H_{82}I_2N_4O_{10},4HI$ obtained by the action of hydriodic acid in presence of the phosphorus on codeia is brought about in accordance with the equations:—

$$(1).\ 4C_{18}H_{21}NO_3+14HI= \\ =4I_2+2H_2O+C_{72}H_{90}I_2N_4O_{10},4HI,$$

$$(2).\ C_{72}H_{90}I_2N_4O_{10},4HI+4HI= \\ =4CH_3I+C_{68}H_{82}I_2N_4O_{10},4HI,$$

rather than the equations—

$$(3).\ C_{18}H_{21}NO_3+HI=CH_3I+C_{17}H_{19}NO_3,$$
$$(4).\ C_{17}H_{19}NO_3+2HI=I_2+C_{17}H_{21}NO_3,$$
$$(5).\ 4C_{17}H_{21}NO_3+6HI=2H_2O+C_{68}H_{82}I_2N_4O_{10},4HI;$$

i.e., that the action does *not* consist in the production of morphia from codeia and its subsequent alteration by addition of H_2, polymerization, addition of 2HI, and subtraction of $2H_2O$; but that these alterations take place in the codeia molecule before the elimination of methyl as CH_3I, this elimination forming the last stage instead of the first; this circumstance may account for the non-production from morphia of compounds belonging to the series $4Y+nHI\pm pH_2O$, which are formed from codeia when the temperature of the reaction reaches 130°, and under other circumstances; for it might naturally be expected that the elimination of the methyl group would place a portion of the molecule in a quasi-nascent condition, thereby rendering further changes more easy.

The foregoing experiments, taken into consideration with the late Dr. Matthiessen,* lead to several noteworthy conclusions and speculations.

(1). The actions of hydrochloric, hydrobromic, and hydriodic acids on morphia and codeia are not precisely analogous; thus the action of HCl appears to give rise more especially to products derived from non-polymerized bases; *e.g.* chlorocodide, which regenerates ordinary codeia by the action of water.† By the action of HBr, codeia yields not only bases apparently formed from non-polymerized codeia (bromocodide, deoxycodeia, deoxymorphia), but also bases derived from polymerized codeia and accordingly containing at least C_{72}, and probably C_{144} (chloro- and bromo-tetracodeia). Hydriodic acid, on the other hand, yields no body whose formula can be written as containing less carbon than C_{34}, and from the physical characters of the first products of the action and the constitution of their derivatives (many of which contain at least C_{68} and some apparently C_{136}), this proportion of carbon must certainly be doubled and probably quadrupled.

Hence, HCl yields single molecule derivatives chiefly; HBr yields single molecule derivatives, and also polymeride derivatives, the polymerides containing at least C_{68} or C_{72} (possibly the formulæ attributed to bromotetracodeia and analogous bases may require doubling, as the physical character of the bases and other salts indicate that they belong to the same rank as the iodine derivatives); HI yields polymeride derivatives only.

GAMBOGE.*

BY J. DE LANESSAN.

True gamboge, by whatever name it enters into commerce, whether as from Ceylon, India or Siam, is the product of one species of plant, the *Garcinia Morella*, Desr. The var. *sessilis* of this plant yields the Ceylon and India gamboge, and the var. *pedicellata* the Siam gamboge. This latter description alone enters into European commerce, and is used in medicine and the arts.

In an anatomical and physiological point of view, gamboge belongs to what are designated the juices proper. It circulates in the laticiferous vessels of *G. Morella* like opium in those of *Papaver somniferum*. In the absence of living specimens the author made an investigation of a well-preserved specimen sent to him by Mr. Hanbury, with the object of studying the disposition of these vessels in the plant, and of tracing the gamboge in the recesses of the tissues where it is formed. The following is briefly the result of his observations.

Neither in *G. Morella*, nor in several other species of the family Clusiaceæ (Guttiferæ), has the author detected the latex in the pitted or rayed or spiral vessels; it appears to be contained in special canals. M. Trécul has made the general remark † that latex may occur indifferently in different kinds of vessels. This fact may be easily verified, for example, in the *Chelidonium majus*, through the yellow colour of the latex. In the root of this plant, when the juice is present in great abundance, the author has found it in the rayed and pitted, and even in the spiral vessels; and besides this it exists in cells that are completely isolated. After a time the transverse sides of these cells break, the latex is poured out into the neighbouring cell, and gradually a true vessel, in which the juice circulates, is developed, formed of cells, placed end to end, of which the walls are ruptured successively. Although the author has been unable to obtain any proof, he is inclined to believe that the laticiferous vessels in the gamboge plant are formed in this manner, especially since he has found it only in special vessels. In the stem these vessels exist chiefly in the bark; but a certain number are found in the medulla, where they are usually very large, and in the medullary rays. He has not found them in the liber region or in the wood. In certain sections he has seen them in the cambium but in these cases their diameter has been inconsiderable. In the bark they are dis-

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* Matthiessen and Wright, Proc. Roy. Soc., vol. xvii. pp. 455, 460; and vol. xviii. p. 83.

† Experiments are in progress which appear to show that the action of HCl on both codeia and morphia is capable of giving rise, when pushed to an extreme, of bases insoluble in ether, and of characters similar to chloro- and bromo-tetracodeia, with less ease, however, than HBr.

* Abstracted from a thesis by the author, printed in the 'Répertoire de Pharmacie,' vol. xxvii. p. 281.

† "Recherches sur les Vaisseaux laticifères," in "Adansonia," vol. viii. p. 100.

tributed in two distinct zones, the one situated in the cortical layer (epiphlœum) the other in the green layer near to and outside the liber (mesophlœum). In the cortical layer, also, the laticiferous vessels appear, in a horizontal section, to be nearly circular, they are closer together than those in the green layer, and more numerous, so that sometimes they form a group of five or six touching at their lateral walls. Their diameter varied in a branch of a year and a half's growth, examined by the author, from 0·03 to 0·05 millimetre. Outside the liber the vessels in the green layer form a zone; they are larger, less numerous, and more widely separated from each other. They are always flattened, and the greatest diameter varying from 0·10 to 0·12 millimetre, and the smallest from 0·05 to 0·06 millimetre. Those in the medulla are the largest of all, and relatively the fewest in number: their diameter is from 0·13 to 0·15 millimetre. Those in the medullary rays are less numerous and much smaller than those in the medulla. The latex contained in the last three kinds of vessels is of a considerably paler yellow colour.

In the petioles of the leaves the laticiferous vessels furnish an interesting study. At the centre of the petiole there is a slender arch composed of vessels and surrounded by medullary cells; around these is a larger fibrous arch. Within the first of these arches there is a large rounded isolated vessel; the others are arranged in two zones. The first situated in the epiderm, composed of twenty to twenty-five rounded vessels 0·05 to 0·06 millimetre in diameter, is interrupted at the level of the concave face of the petiole; the second, situated at the circumference of the larger fibrous arch, and composed of ten or twelve vessels, is not interrupted as the first. In the leaf the laticiferous vessels follow the ramifications of the nerves, one or two being present in each vascular vessel.

In *G. Morella* these vessels are rendered very distinct by the beautiful orange yellow gamboge with which they are filled. If fragments of branches are left for some time in water or alcohol, the liquid assumes a splendid yellow colour from the solution of the latex contained in the extremities of the broken vessels.

Preparation of Gamboge.—In the month of June or July, when the sap is in active circulation, the leaves and young branches are broken off and the yellow juice that flows from the wounds is collected in cocoa-nut shells or twisted leaves of the plant itself; it is afterwards poured into larger vessels made of clay and dried in the sun until it is of proper consistence to be wrapped in leaves. From this mode of obtaining it, it received the name by which it is sometimes known of *gummi guttæ*. The method employed by the Malays and Chinese to give it the qualities sought for in commerce is unknown. After its purification it is agglomerated into irregular masses or cakes, and wrapped in leaves, or poured into bamboos, of which it retains the shape. It is sometimes met with in the English market still enclosed in the bamboos. In Ceylon it is obtained by cutting the bark of the tree in several places with a sharp stone just as the flowers commence to appear, the juice which flows solidifies in the sun. Sometimes a slip of bark the size of the hand is removed; this is done in the morning. The gamboge oozes through the pores in nearly a liquid state, but soon thickens, and is collected the following morning. The tree is not injured by the wound, which heals rapidly.

The *resin* or *gambogic acid* ($C_{40}H_{23}O_8$ or $C_{20}H_{23}O_4$) is obtained by evaporating to dryness the ethereal tincture of gamboge. It is friable, of an orange-yellow colour, insoluble in water, soluble in alcohol, and especially in ether, and forms salts with alkalies. It purges well in doses of twenty-five centigrams, and is sometimes employed in the preparation of the "elixir de Giacommi," as it acts more energetically than gamboge, without pain or uneasiness.

Elixir of Giacommi.—Digest, with a slight heat 15 grams of gamboge in 240 grams of 75 per cent. alcohol; filter and add 120 grams of simple syrup and as much boiling water, stirring for several minutes. The product is a golden-coloured liquid, agreeable to the taste, the dose of which is from one to four spoonfuls.

VANDELLIA DIFFUSA.*—AN EMETIC.

BY DR. A. POSADA-ARANDO.

Vandellia diffusa, or Paraguay herb, is a small herb, similar in appearance to mint, but straggling over the ground. The stem is square, and slightly pubescent. The leaves are opposite, nearly sessile, oval, obtuse, serrato-crenulate, glabrous and dark green above, slightly pubescent and purplish underneath, twenty millimetres long. The flowers are axillary, solitary, smaller than the leaves, and of a rosy white colour; calyx acutely 5-partite; corolla bilobed, the upper lip bilobed, the lower trifid; stamens didynamous; stigma bilobed. The fruit is an oblong capsule, acuminate, ten millimetres long, consisting of two many-seeded cells, opening by two valves parallel to the diaphragm; the seeds small and yellowish.

This plant grows spontaneously in the warm and temperate parts of Columbia, from the sea-level to an elevation of 1800 metres. It is found on the seashore, in the Magdalena valley, in the interior of Antioquia, and in the Choco, preferring sandy and humid soils, such as the banks of rivers and the borders of springs. It flowers from January to May.

This plant is used by the people of the country as an emetic. For this purpose, a good handful of it is boiled in half a litre of water, and a small cupful taken every ten minutes until vomiting ensues. Employed in this manner, the vandellia is as certain in its action as ipecacuanha, without occasioning violent purgations or uncontrollable vomiting; the only drawback to its use being its very bitter taste.

In order to determine its composition, and to become better acquainted with its properties, the author made an investigation of the plant with the following results:—

The extract obtained by evaporating the juice in a water-bath is dry, and, when powdered, of a greenish-grey colour. It contains a fatty matter, coloured green by chlorophyll, viscous, with a nauseous odour and taste, very soluble in ether, insoluble in alcohol; an extractive matter, not very plentiful, bitter, soluble in water at all temperatures, and in warm alcohol, insoluble in cold alcohol; and a residue in much greater proportion than the other principles, gummy in appearance, exclusively soluble in water. This latter part is quite insipid and inert; and the bitter extractive matter exercises no marked action on the organism. It follows, therefore, that the fatty matter is the only active principle of the plant.

The extract appeared comparatively less active than the plant. Taken internally, in the form of pills, in doses of from 75 centigrams to 1 gram it purges with slight griping pains. To cause vomiting, it is necessary to give $1\frac{1}{2}$ gram in solution. The fatty matter, formed into pills with crumbs of bread, purges sufficiently with a dose of 15 centigrams, but it provokes very disagreeable eructations and great nausea; by administering 20 or 25 centigrams, and ordering the patient to drink afterwards, the emetic action is certain.

The author hopes to obtain a further supply of the plant and to try it under other forms. At present he thinks that a syrup made with the juice, moderately concentrated, an ethereal tincture, or the plant dried and reduced to powder, would be the best preparations.

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* Journal de Pharmacie et de Chimie. [4] vol. xv. p. 166.

TESTS FOR NARCEINE.

BY M. STEIN.

It is known that iodine gives a blue colour with solid narceine. This reaction, similar to that of iodine with starch, was long since noticed by Pelletier and Winkler, the latter, however, points out that it does not always take place. If too much iodine be added, the narceine is coloured brown, and the blue colour does not reappear until the excess of iodine has been saturated by ammonia. But ammonia itself when in excess dissolves the narceine, and causes the colour to disappear. All the solvents of narceine act in the same manner.

It has also been stated by M. Dragendorff, that solutions of narceine give a crystalline precipitate with the double iodide of zinc and potassium. It is therefore proposed to make use of these two reactions simultaneously for the detection of narceine in solution. If the iodide of zinc and potassium, with a small quantity of solution of iodine be added to such a solution, and agitated with ether to carry off excess of iodine, the presence of a small quantity of narceine will be indicated by a clear blue colour. The other alkaloids of opium do not possess this property.—*Journal de Pharmacie et de Chimie* [4], vol. xv. p. 59.

COD-LIVER OIL AND LIME SOAP.

M. E. Beck (*Journ. Pharm. et de Chimie*, 4th ser. vol. xiv. p. 43) describes the preparation and properties of a soap made from lime and cod-liver oil, in the following proportions:—

Slacked Lime, in fine powder	600 grams.
Cod-Liver Oil	500 „
Rain Water	1700 „

The lime is to be mixed with 1500 grams of the water, boiling, into a homogeneous milk of lime. The other 200 grams of water are to be added hot to the cod-liver oil and stirred to form a perfect emulsion. To this emulsion the milk of lime is to be gradually added with continual stirring; the mixture gradually heated to the boiling-point and a gentle ebullition kept up, with continual stirring, until the lime has disappeared and the soap become uniformly yellow and firm. This is washed with water until, when kneaded and pressed, the liquor that runs away is colourless and tasteless. It should then be freed from moisture by a gentle heat, and preserved in closed vessels. When recently prepared, the soap has a waxy consistence, convenient for the preparation of pills, dragées or pastilles; and if white oil be used it is perfectly inodorous. Tin vessels must not be used, in its preparation, which may be best accomplished on a small scale in porcelain capsules. M. Beck claims for this soap that, when used as a medicinal agent, it facilitates the assimilation of the calcareous element and neutralizes the objectionable features of the oil. A suitable pill-mass may be formed by mixing together in a mortar 20 grams of the calcareous cod-liver oil soap with 4 drops of oil of bitter almonds.

PULVERULENT TAR.

As a convenient method of facilitating the division and increasing the solubility of tar, M. Magnes-Lahens recommends (*Journ. Pharm. et de Chimie*, 4th ser. vol. xiii. p. 42) a preparation made by mixing together in an earthenware vessel two parts of finely divided charcoal and one part of liquid tar. The product, which he calls pulverulent tar, resembles small grains of gunpowder; it does not soil either the finger or the vessels with which it comes in contact and yields freely to water the tar which it contains, the temperature most favourable to solution being 20° C. (68° F.). M. Magnes-Lahens proposes to prepare from pulverulent tar a syrup which, although too concentrated for administration pure, will keep well, and, if diluted in the proportion of a tablespoonful of syrup to a tumblerful of water, gives a tar-water resembling that of the French Codex, with the addition of sugar. The formula given is—

Pulverulent Tar	50 grams.
Water	180 „
Granulated Sugar	320 „

Mix the tar and sugar together in a mortar, and then add the water and heat the mixture in a water-bath to 60° C.; remove it from the bath and shake until the sugar is all dissolved; strain while hot and again when cold. The pulverulent tar may also be used for pills with a suitable excipient, and for fumigation by throwing a few grams on a hot fire-shovel.

THE DIFFERENCE BETWEEN STINKS AND FEVER POISONS.

In a communication to the *Lancet*, Mr. Buée, of Slough, calls attention to the great difference there is between stinks and poisons. He says, "Stinks may or may not be organic, and may damage health; but fever poisons are organic, have a life, a growth, will produce their like, and, if planted in favourable soil, grow, run their course, live their natural life, die out, and leaving seed behind them, reproduce themselves; and, above all, have *no* smell. A boy who has never had scarlatina gets into a railway carriage in which an infected person has travelled; he smells nothing, yet takes the disease. A well-attended person suffering from that disease or any other, has a scentless room; yet an in-comer predisposed, though not smelling anything, takes the illness. The scabs from small-pox and cow-pox have no smell, yet they will inoculate. The fact is, though as yet we cannot see the germ, our microscopes and means not being at present sufficiently powerful, yet common sense and reasoning from the habits of these poisons tell us, I think plainly, that they are organic and inodorous. And, if so, what should we do besides draining and ventilating? Why, decompose, disinfect and destroy the vitality of the germ, never allowing it, if once cast into the closet, to get again into the atmosphere alive. Chloride of lime, carbolic acid, and last, not least, though cheapest, solution of sulphate of iron, which last, I believe, gives out much ozone, and is as good a destroyer of germs as anything I know. Let one of these be used constantly in all closets, sinks, and drains. These poisons do not necessarily require a human body for their growth; they will grow on a dunghill or in a cesspool, wherever there is a favourable nidus, like fungi."

FIRE AT MANCHESTER.

Shortly before three o'clock on Friday, the 12th inst., flames were observed to be issuing from the premises of Mr. William Mather, plaister manufacturer, in Trentham Street, Hulme, Manchester. An alarm was raised and the fire brigade were quickly on the spot, but by this time nearly the whole range of buildings, triangular in shape and of comparatively recent erection, was enveloped in flames. A good supply of water was obtained, and after working about two hours, the fire brigade were successful in obtaining a mastery over the flames. Two sides of the building have been destroyed by fire, and of the other side, the top floor (the premises are two storeys high) alone has been damaged by fire, and the room below by water. Mr. Mather employed nearly 100 persons, and some of these will be temporarily thrown out of work. The amount of damage done is estimated at from £7000 to £10,000, and it is believed that this loss will be partially met by insurances effected in the offices of the Sun and Commercial Union.

The Pharmaceutical Journal.

SATURDAY, APRIL 20, 1872.

Communications for this Journal, and books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

HOSPITAL DISPENSING.

THE report of an inquest held this week on a child poisoned by the inadvertence of officials at the London Hospital, will recall attention to some defects in hospital dispensing which have before called for remark. In this case the evidence seemed to show that certain dispensing functions were entrusted to the porter, and that he dispensed, for the benefit of a child, a mixture of which the soothing properties went on to the production of fatal narcosis, after the first dose. It very often happens in large institutions that the secondary purposes are of so much greater brilliancy and interest than the final ends for which the institution is created. that the lesser obscures the greater, and the means seem more important than the end. A hospital is essentially a house of cure; and even though all physicians may not have the robust faith of Dr. QUAIN, who announced in the Lumleian Lectures at the Royal College of Physicians, that he had more faith in his drugs than in himself, yet all are accustomed to depend more or less upon this department of the hospital for the final issue of their efforts to cure.

There is not any department of a hospital which is habitually so much starved as the dispensary. The dispenser is commonly overworked and underpaid; all sorts of devices are adopted for cutting down the expenditure on this department. In many a hospital the Mist. Quinæ, unless marked 'special,' is ordered to be made up without quinine, and the Mist. Sarsæ is innocent of sarsaparilla bark. The economy which ostracizes costly drugs, extends to all the arrangements of the dispensary. The patients must bring their own bottles and gallipots; and so, spite of the liberal anxiety of the Medical Officer of the Privy Council to compel pharmaceutical chemists to dispense potent drugs only under very great precautions, and in vessels of particular shape, the spectacle may be observed at all the metropolitan hospitals, and no doubt at that to which Mr. SIMON is attached, of little children carrying away solutions of atropine, strychnine, opium, and almost every poison under the sun, in the familiar vessels of daily household use. Black bottles, which yesterday held the family beer, become the receptacles of 'soap liniment;' belladonna unguent supersedes Keiller's marmalade, and although the signature 'Poison' is imposed upon the marmalade pot, it is hardly surprising that very awkward mistakes sometimes occur, and that misadventure with the medicines obtained from out-patient departments is among the most fertile sources of accidental poisoning.

The dispenser is not always fortunate in the acquirements of the skilled assistance allowed him, and although the dispensary porter is often a very intelligent though uneducated person, whose only failing is too strong an affection for methylated spirit and for cordial tinctures, he rubs along with such assistance as well as he can, and marvellously escapes committing manslaughter.

It is to avoid overwhelming the dispenser with an amount of work which would involve affording him adequate skilled assistance that a small branch dispensary is commonly established in the casualty room under the management of the casualty porter. Here are a few antidotes to poison, mixtures against cough and diarrhœa, liniments and ointments. The arrangement is rough and ready; it is very economical and it is considered to work well. It has only the practical disadvantage, of which the London Hospital case affords an example, that the man does not quite understand the dangerous properties of the things which he handles so familiarly, and that he is apt to give to children what is meant only for adult mankind. Then an inquest follows, and a scandal. Let us hope that more solid results may be attained, and that the recommendation of the Jury may lead to reform.

"METHYLATED WHISKEY."

Two years ago Mr. HARRY NAPIER DRAPER called attention to a practice prevalent in the north of Ireland of using as a beverage ether, prepared from methylated spirit.* We do not know whether the demand for such heterodox intoxicants has since increased, but to judge from what the *British Medical Journal* reports to have been stated by Dr. HODGES, at the last meeting of the Chemico-Agricultural Society of Ulster, there is a plentiful supply. He exhibited a specimen of "whiskey" which had been brought to him by two men who had been incapacitated by drinking a small portion of it at a public house. He found, on analysis, that it contained a large amount of naphtha. He has also met with mixtures containing sulphate of copper, cayenne pepper, sulphuric acid and a little spirits of wine. One specimen submitted to Dr. HODGES, which he said was a fair specimen of the drink sold in low-class public houses, was composed of naphtha and

* PHARM. JOURN., 2nd ser. vol. xi. p. 648.

a slight colouring of whiskey. It appears that this trade is carried on with impunity, no local authorities in Belfast or the province of Ulster caring to exercise the powers they possess for the suppression of the traffic.

Dr. Dobell having endeavoured in vain to find any bed or chair that would meet all the necessities of patients suffering from some of the severer stages of chronic heart disease, has succeeded in devising what he designates a "heart-bed," which appears from the manner in which it can be arranged to support the head, or arms, or any other part in any desired position, to possess qualities that will make it a boon to persons so afflicted. It is somewhat in the form of an ordinary couch, at the head of which there is a revolving seat, enabling the patient to turn in any direction. On each side, but within this seat, is a crutch with hand-rest that may be adapted to any required height for the patient to rest upon; in front there is a semicircular table, upon which the head may be supported, and in this table there is a sunken tram, upon which runs a circular rest sufficiently wide to carry a tray or desk. The lower portion of the bed can, by means of hinges and a rachetted supporter, be inclined so as to allow the legs of the patient to be lowered, or it may be removed altogether, leaving the upper portion in the form of an easy-chair.

Owing to the higher price invariably realized in this country for Barbadoes aloes over the product of the Cape, some interest has been excited in the latter colony in the matter, and a case of plants of *A. vulgaris*, Lam. (*A. barbadensis*, Mill.) has been sent to the Cape Botanic Garden by the Governor of Barbadoes. These plants, which were sent from Barbadoes, *via* England, arrived at their destination in fair condition, and will be taken care of in the Botanic Garden, and increased for the purpose of distribution. The Barbadoes aloe is described as "of a lowly growth compared with some of the Cape species, but it has the merit of rapidly propagating itself, through natural means, by suckers from old-established plants." Much of the inferiority of the Cape aloes, however, appears to be due to carelessness in the preparation of the drug.

Transactions of the Pharmaceutical Society.

A list of persons who have passed the Preliminary held on the 8th inst., will be published next week; also list of Major and Minor held on the 17th and 19th inst.

Errata.—Page 831, col. 2.

Benevolent Fund.

For the list given for *Doncaster*, *read* as follows :—

Atkinson, Stephen	0	5	0
Dunhill, Son and Shaw	1	1	0
Howorth, James	0	10	6
Slack, William	0	5	0

Proceedings of Scientific Societies.

ROYAL SOCIETY, EDINBURGH.

A meeting of this Society was held on the evening of Monday, 15th April; Professor Kelland presiding.

Sir Robert Christison, Bart., read a paper on "The Action of Water on Lead." After recapitulating the results of former investigations, communicated to the Society in 1842, Sir Robert proceeded to refer to the labours of other inquirers by which our knowledge of the subject has since then been extended in various directions, and to describe certain fresh experiments which he has been making with the view of determining particular points and arriving at some general law or laws. He said that the united results of all inquiries seemed to be that very few natural waters, pure or impure, were so absolutely inert that they would not show some trace of lead dissolved in them when submitted to a delicate test. Probably the limit of safety to persons using a water for domestic purposes was that the lead should only be in the proportion of about one-millionth to the water. Many facts had been brought forward which violated the general doctrine that certain neutral salts protected lead from the action of water. Instances had been produced of hard water having corroded and perforated lead cisterns and conduits. The circumstances attending those cases had seldom been stated with sufficient precision to furnish an explanation; but his inquiries seemed to point to the conclusion that many of those so-called solvent actions of hard waters were not instances of pure chemical corrosion, but were instances in which the corrosion took place greatly from galvanic action. Besides, the presence of certain non-protective or feebly protective salts imparted a corrosive power even to water which abounded in highly protective salts. With all the objections brought against the St. Mary's Loch water, it did not act upon lead. On examining the water, he had found that the quantity of saline matter in it, though small, was not so insignificant after all. Edinburgh water, when diluted to the same degree, had no action upon lead, or at least so feeble an action that one might say there was none. The presence of peaty matter in the St. Mary's water did not undo the power of the protective salts. He hoped to be able to prove on a subsequent occasion that the peaty matter might even tend to increase the protective power of those salts. He expected to show the Society that organic matters, in one shape, protected lead from being acted on, while in another shape, they facilitated the solution of lead in water.

Mr. Young read a brief notice of an experiment he had made with the view of preventing the bilge water from corroding the iron plates of his yacht. In one bottle he showed bilge water red with oxide of iron, in another bilge water quite colourless, the difference having been produced by the introduction of lime, which seemed to have the effect of preventing corrosion.

ROYAL HORTICULTURAL SOCIETY.

The Production of Honey Dew.

At the last meeting of the Scientific Committee of this Society Professor Dyer read the following abstract of a memoir by M. Boussingault on the "Production of Honey Dew."*

On July 21st, 1869, at Liebfrauenberg, the leaves of a lime were coated on their upper surface with an extremely saccharine viscid matter. The tree in fact afforded an example of the production of honey-dew, a manna-like substance, which is frequently observable upon the lime, the black alder, the maple and the rose.

* 'Comptes Rendus,' Jan. 8, 1872.

I have myself noticed it upon a plum-tree, and—which is a very rare occurrence—upon a young oak.*

On the 22nd the honey-dew was sufficiently abundant in the morning to fall in large drops upon the ground. It was a shower of manna. At three o'clock the saccharine matter no longer remained fluid upon the leaves which were exposed to the sun. It had sufficient consistency not to adhere to the fingers when touched; it formed, in fact, a sort of transparent and flexible varnish. Out of the sun the honey-dew still retained its viscous condition.

On the 23rd, at seven in the evening, several leaves at the extremity of a branch were washed and sponged, so as to remove all the saccharine matter. At six o'clock the following morning the leaves which had been washed seemed free from honey-dew, but, on examination with a lens, minute glistening dots, due to very small drops, were observable. At seven the same evening the appearance of the leaves remained the same. The day had been warm; the temperature in the shade 84°.

On the 25th numerous spots of honey-dew were scattered over the leaves, but there was none upon the principal veins; at three o'clock the temperature was 86°.

During the night a violent shower removed a great part of the honey-dew formed during the evening. It became, therefore, impossible to follow, as had been proposed, the progress of the secretion upon the leaves washed upon the 22nd. A swarm of bees settled upon the tree.

On the 27th, the whole of the honey-dew had disappeared, in consequence of the rain which fell during the evening of the 26th. The temperature had stood at between 62° and 75° F. On the morning of the 28th the leaves bore numerous spots of honey-dew, which had made their appearance during the night. On the 29th it had increased; on some of the leaves it occupied a third of the surface. At two o'clock the temperature was 84°. On the 30th the honey-dew was very abundant. The lime-tree remained covered with it till the commencement of persistent rains, which took place at the beginning of September.

On two occasions, namely July 22nd and August 1st, honey-dew was collected by washing the leaves. The solution after treatment with lead subacetate to precipitate albuminous and mucilaginous matters, yielded a syrup in which crystals of sugar formed. On examination it contained a sugar analogous to cane sugar, and also a reducing sugar. By fermentation with yeast the two sugars disappeared completely. In the fermented liquid, however, a substance remained possessed of very strong powers of right-handed rotation. This proved to be dextrine, already announced by Berthelot as existing in the mannas of Sinai and Kurdistan, and subsequently by Buignet in a manna occurring in "tears" (*manne en larmes*).

I have endeavoured to find mannite, and with especial care, because Langlois, an experienced observer, has found it in a saccharine matter collected from the leaves of a lime. Mannite is so easy to detect that I have not the slightest doubt as to its presence in the product studied by Langlois.

Optical observations have shown that the reducing sugar detected in lime-tree manna is not glucose (grape sugar), of which the rotatory power is 56° in the right-handed direction, but lævulose (inverted or fruit sugar) which has a left-handed rotatory power of 26°.

Taking in consideration those substances only which rotate the polarized ray, the composition of honey-dew will be :—

	July 22.	August 1.
Cane sugar	48·86	55·44
Inverted sugar	28·59	24·75
Dextrine	22·55	19·81
	100·00	100·00

These analyses show that the composition of honey-dew collected with several days' interval has not remained the same. No doubt one has no right to expect that the composition should remain precisely identical; what, however, is remarkable, is the analogy which exists in composition between the honey-dew of the lime and the manna of Mount Sinai analysed by Berthelot. Its composition is, in fact, identical with that of the honey-dew collected on August 1st.

Cane sugar	55
Inverted sugar	25
Dextrine	20
	100

It is a discovery not without interest to have found the manna of Mount Sinai in the Vosges.

In attempting to compare by analysis the quantity of honey-dew existing upon the leaves of the lime which was affected with the saccharine matter contained in the leaves in their normal state, he arrived at the following result :—

Cane Sugar.	Inverted Sugar.	Dextrine.	Weight in Grammes.
In 1 Square Metre of Healthy Leaves :—			
3·57	·86	0·00	4·43
In Honey-dew Collected from ditto :—			
13·92	7·23	5·62	26·77
Difference :—			
10.35	6·37	5·62	22·34

The amount of manna, therefore, which exudes from the affected leaves is considerable, especially when one takes into consideration the amount of dextrine, a substance which does not exist in the healthy leaves at all.* From calculations made upon a tree of the same age and size, the leaves of the affected lime-tree would have a surface of 240 square metres, or rather of 120 square metres (equal to 145 square yards), since the manna only covers one side of their surface. It would result from this, that on July 22nd, 1869, the lime bore two to three kilogrammes (equal to about 4 lb. to 7 lb.) of honey-dew, reckoned in a dry state.

In the normal conditions of vegetation the saccharine matters elaborated by the leaves, under the influence of light and heat, are distributed through the organism of the plant with the descending sap. In the abnormal state, which determines the production of the honey-dew, the saccharine matters are accumulated at the upper surface of the leaves, either because the movement of the sap is interrupted, or because it is retarded by the viscosity resulting from the formation of dextrine.

The production of honey-dew cannot be due merely to meteorological influences—to the effect of warm and dry summers. No doubt the lime of Liebfrauenberg secreted it during a summer when there were periods of high temperature, accompanied by great dryness; we must not, however, lose sight of the fact that it was a single tree that was attacked by the malady, and that at a little distance there were limes which were perfectly healthy.

It has been supposed that aphides, after having drawn the honey-dew from the parenchyma, discharge it again

* A saccharine substance exudes from the leaves of *Quercus manifera*, in Kurdistan. (Lindley, Bot. Reg., May and June, 1840.) Such a secretion from the oak is more than once alluded to by Latin poets. In the Golden Age—"Duræ quercus sudabunt rescida mella." (Virg. Ec. iv. 30.) Martin remarks (Virg. ii. 36), "It is no uncommon thing to find a sweet glutenous liquor on oak leaves." W. T. D.

* The occurrence of dextrine in the living tissues of plants is at the most hypothetical. Sachs, *Phys. Vég.* (Fr. ed.), 377.

scarcely altered; but it is contrary to the results of analysis to assign it a composition similar to that of leaf sap. It is, however, admitted that certain insects possess the faculty of determining the production of manna. Thus it is to the punctures of a coccus that Ehrenberg and Heimprich attribute the formation of the manna which is still found on the mountains of Sinai.

The manna falls to the ground from the air (that is to say, from the summit of a tree and not from the sky). The Arabs call it *man*, and they, as well as the Greek monks, collect it to eat upon bread in the same way as honey. I have myself seen it fall, collected it, and brought it to Berlin with the plant and the remains of the insect. This species of manna is produced by *Tamarix manifera*, Ehr. As with many other mannas it is the result of the punctures of an insect, which in the present case is *Coccus manniparus*, H. and Ehr. (Berthelot, *Ann. de Chim. et de Phys.*, ser. 3, lxvii. 83.)

The manna, consequently, collected in 1869 at Liebfrauenberg, had not the same origin as the Sinai manna, though it had the same composition. At the time of its appearance upon the lime no insects were observable. It was later that a few aphides were seen glued upon a certain number of the leaves.

I have already stated that after having washed the extremity of a branch, glutinous points were seen gradually to rise; at first scarcely perceptible, they increased each day, so as finally to cover the whole of the upper surface of the leaf. This slow and progressive development of the honey-dew was clearly effected without the intervention of aphides, which did not make their appearance till subsequently, like the flies and bees, either to feed upon the secretion or to pilfer it.

In a subsequent number (Feb. 12th) Harting states that honey-dew is produced by *Aphis tiliæ*, which, living on the under surface of the leaves of the lime, drops its excrement on the upper surface of the leaves beneath. Analysed by Gunning at Amsterdam, it proved to consist of cane sugar. Boussingault remarked, in reply, that the manna of Liebfrauenberg, like the Sinaitic manna analysed by Berthelot, contained, in addition to cane sugar, fruit sugar and dextrine. He added, also, that the leaves of the lime contain considerable amounts of cane sugar almost pure, the origin of which could not be attributed to insects."

[A paper by Goethe (*Œuvres d'Histoire Nat.*, par Martins, pp. 321-328) contains a similar conclusion. He says (p. 324), "I have seen limes, of which the leaves seemed varnished, but where not a single insect was visible. The juice is secreted by the plant itself." Mr. Hanbury informs me that he has noticed the exudation of a saccharine matter from a Canella, and that after repeated cleansings it still made its appearance. He has seen also the occurrence of minute crystals of sugar upon the corolla of the Azalea. De Candolle mentions the same thing in *Rhododendron ponticum* (*Phys. Vég.* i. 238). This is, however, different to the secretion which takes place on leaves, because it is probably merely due to the loss of water from the flower preparatory to fading.

De Candolle remarks that granular secretions are found on the young shoots of the larch, and are collected locally under the name of manna of Briançon; they also occur on *Salix alba*, and upon some other trees. "We cannot affirm," he says, "either that they are a natural excretion, or that they are produced by insects" (*l. c.* p. 240). Dr. Masters states in the 'Treasury of Botany' (p. 38) that a manna-like substance is produced from species of alhagi, and that it is an exudation from the leaves and branches of the plant only appearing in hot weather. Saline secretions from leaves have been more frequently observed. De Saussure states that an accumulation of saline matters at their surface often occurs in garden vegetables, transpiration being impeded, the leaves are ultimately destroyed (*Recherches*, 264, 265). De Candolle found a saline secretion from the leaves of a Reaumuria to consist of carbonates of soda and potash (*Phys. Vég.* i. 237).] W. T. D.

Mr. Douglas, of Loxford Hall Gardens, Ilford, informed us after the meeting that he has some orange trees at the back of a cucumber-house which are frequently affected with honey-dew, though no green-fly ever gets near them, and that he has long been perfectly satisfied that honey-dew is not the result of insect agency.—*Editor of Gardeners' Chronicle.*

Parliamentary and Law Proceedings.

HOUSE OF LORDS.

The Adulteration of Liquors.

Tuesday, April 16th, 1872.

In the course of the speech made when introducing the Bill relating to the sale of intoxicating liquors, the Earl of Kimberley stated that in it he proposed dealing with the adulteration of liquors. He said that nothing was more discreditable than the adulteration now practised; and that there was something so peculiar about public-house beer compared with that procured direct from the brewer, that he had always thought it best to avoid it. He read a description that had been furnished to him of a process of adulteration frequently practised, by substituting a mixture of "foots" and water, together with salt and copperas, for a portion of the beer originally contained in the barrel; and said that honest brewers and publicans, as well as the consumer, would welcome any reasonable provisions for preventing such adulterations.

The Duke of Richmond said that the noble earl had given an account that would almost make a man think twice before touching a glass of beer again; but that he had contented himself with giving an account of the adulteration without saying how he meant to deal with it.

HOUSE OF COMMONS.

The Public Health Bill.

Tuesday, April 16th, 1872.

In answer to a question put by Mr. Rylands, whether there was any probability that the Public Health Bill would be proceeded with on Friday, the 26th inst., Mr. Gladstone said that he would inform the House in the course of a few days.

The Adulteration of Liquors.

Wednesday, April 17th.

In the course of the discussion upon Sir H. Selwin-Ibbetson's Spirituous Liquor Bill, Mr. Watney said that he could not see why the question of adulteration should be dealt with at all in connection with this subject. Adulteration was common to all trades; and it would be more satisfactory if that branch of the subject were dealt with in some such Bill as that brought in by the hon. member for Birmingham.

Dr. Brewer said that he believed adulteration was far more common than was supposed; and it was not always by water, but often by deleterious drugs.

Mr. Greene said that the result of creating a monopoly would be to place the trade in the hands of inferior brewers. It was impossible to adulterate good beer like that supplied by his hon. friend the member for Derby; and the result of a monopoly would be to place such manufacturers at a disadvantage.

Hospital Dispensing.

On Tuesday, April 16th, Mr. Humphreys held an inquest in the Mile End Road, on the body of Anne Charlotte Head, aged 3. The deceased suffered from a cough, and her father, a shoemaker, of 14, Leslie Street, Mile End Road, procured her a mixture from the porter at the London Hospital. He gave her three doses between Thursday night and Saturday afternoon, and at 7 o'clock in the evening she died. Mr. Robert Edward Swyer, M.D., on making a *post-mortem* examination, found that death had been caused by narcotic poisoning. Having tested a portion of the cough mixture in question, he was decidedly of opinion that it was a most improper medicine for a young child, and that a teaspoonful would be sufficient to cause death. In the course of the hearing, it transpired that the mixture was obtained without the knowledge of the doctors, as was often the case. The jury said that this reflected great discredit on the management of an excellent institution; and they were of opinion that the death of the deceased lay at the door of the porter. The coroner said no jury would convict the latter of manslaughter, but he was convinced that great blame was to be attached to him, and that the hospital authorities ought at once to put a stop to so dangerous a practice. The wonder was that such a system of wholesale illegal physicking had not before now brought about disastrous results. The jury agreed that the deceased died from the effects of narcotic poison administered to her inadvertently; and requested the coroner to write to the authorities of the London Hospital to inform them of the circumstances under which the deceased came by her death. The coroner intimated that he would carry out the wish.—*Times.*

Reviews.

A Series of Chemical Labels for use in Laboratories, etc. Published by Mottershead and Co., Manchester.

The progress of Chemistry in Great Britain is much facilitated by the enterprise of a few manufacturers and dealers, who are always prompt in making or importing the chemicals or apparatus discovered or devised by pioneers in the science, or required for educational purposes by its teachers and students. The book of labels before us, all adhesive and easily detached, is apparently intended for the use of analysts and pupils in general practical chemistry, who wish to label their test-bottles in accordance with the unitary nomenclature of modern chemistry; and such workers will thank Messrs. Mottershead for the handy set of labels now issued. For learners in that branch of applied chemistry which is followed by medical practitioners and pharmacists, the series is not so useful. There will apparently be no difficulty in introducing the unitary notation and nomenclature into pharmacy and medicine by simply regarding and speaking of the old salts of potash, soda, etc., as those of potassium, sodium, etc.; and from the remarks of Dr. Quain at the last meeting of the Medical Council, there can be no doubt this course will be adopted in the next edition of the British Pharmacopœia. No inconvenience to prescriber, dispenser, or pupil will result from the employment of such a name as sulphate of magnesium instead of 'sulphate of magnesia,' but the variety of the unitary nomenclature adopted in Messrs. Mottershead's series of labels gives 'magnesium sulphate' for this substance, and similar names for other salts, as 'potassium nitrate,' 'sodium carbonate,' 'copper sulphate.' Both classes of names are varieties of unitary nomenclature, but that which is adopted by Messrs. Mottershead does not accord with the language and practice of medical men and chemists and druggists, while the other to which we have adverted does so most completely.

Proceedings of the American Pharmaceutical Association. 1871. Sherman and Co., Philadelphia.

This substantial volume of six hundred octavo pages is a record of the proceedings at the nineteenth annual meeting of the American Pharmaceutical Association. Our own Conference was founded to a great extent upon the model of this Association, and the general operation of the two bodies is therefore very similar. Meeting in a different town each year, the last convention of American pharmaceutists was held at St. Louis. It was attended by an able representative of our own Society; and those who were present at the pharmaceutical meeting in November will recollect the eloquent tribute paid by Mr. Brady to the excellence and abundance of the work accomplished by our Transatlantic brethren. A glance through the present volume amply justifies this verdict.

The reports issued by different committees working through the year are a striking feature of this Association. The first of these is a report on the progress of pharmacy, giving an abstract of those papers, published either at home or abroad, which have any reference to matters of pharmaceutical interest. It takes the place, therefore, of our own 'Year-book of Pharmacy.' The abstracts here given are somewhat short, but fairly embrace all the important work of the year. The report on adulterations also serves a most useful purpose, by keeping pharmaceutists acquainted with the sophistications likely to occur, and thereby helping to maintain a certain standard of excellence in the drugs and chemicals employed.

The voluntary papers which were read at the meeting are all of a high order of merit, and exhibit much experimental research and sound scientific knowledge. These proceedings constitute a valuable addition to the literature of pharmaceutical science, and we heartily congratulate the members of the American Association on the skill and energy with which they have pursued their labours.

MEETINGS FOR THE ENSUING WEEK.

Monday, April 22. — *Medical Society,* at 8 P.M.
Society of Arts, at 8 P.M.—"Silicates, Silicides, Glass and Glass Painting." By Professor Barff (Cantor Lecture).
London Institution, at 4 P.M.—"Elementary Music." By Mr. E. J. Hopkins.

Tuesday, April 23. — *Royal Institution,* at 3 P.M.—"Statistics and Social Science." By Dr. Guy.
Royal Medical and Chirurgical Society, at 8.30 P.M.

Wednesday, April. 24 — *Society of Arts,* at 8 P.M.—"Nuts, their Produce and Uses." By Mr. P. L. Simmonds.
London Institution, at 12 noon.—Annual Meeting.

Thursday, April 25. — *Royal Society,* at 9 P.M.
Royal Institution, at 3 P.M.—"Heat and Light." By Dr. Tyndall.

Friday, April 26. — *Royal Institution,* at 9 P.M.—"The Modern Greek Language." By Professor Blackie.
Quekett Club, at 8 P.M.

Saturday, April 27. — *Royal Institution,* at 3 P.M.—"The Star Depths." By Mr. R. A. Proctor.
Royal Botanic Society, at 3.45 P.M.

The following journals have been received:—The 'British Medical Journal,' April 13; the 'Medical Times and Gazette,' April 13; the 'Lancet,' April 13; the 'Medical Press and Circular,' April 17; 'Nature,' April 13; the 'Chemical News,' April 13; 'English Mechanic,' April 12; 'Gardeners' Chronicle,' April 13; the 'Grocer,' April 13; the 'Journal of the Society of Arts,' April 13; 'Grocery News,' April 13; 'Food, Water and Air' for April; 'Archiv for Pharmaci og technisk Chemi med deres Grundvidenskaber,' Nov. 1870 to Jan. 1872; 'Gazette Médicale d'Orient' for Feb. and March; Practitioner' for April; 'American Chemist' for March; 'Zeitschrift des allgemeinen osterreichischen Apotheker Vereines,' Nos. 1 to 4 (1872); 'Journal of Materia Medica' for March; 'Pharmacist' for April; 'American Journal of Pharmacy' for April; 'Druggists' Circular' for April; 'Chemist and Druggist' for April 15; 'Répertoire de Pharmacie' for March.

Notes and Queries.

**** In order to facilitate reference, correspondents are requested to mark their answers in each case with the title and number of the query referred to.*

No notice can be taken of anonymous communications. All queries or answers should be accompanied by the name and address of the writer.

[312.]—INCENSE.—Try Exodus xxx. 34; or the following from Ure's 'Dictionary of the Arts':—

Santal Wood in powder, 1 lb.
Vitivert, 2 ozs.
Cascarilla Bark, ½ lb.
Gum Benzoin, ½ lb.
Grain Musk, ½ oz.
Powdered Nitre, 2½ oz. HENBANE DWINING.

[314].—PINK OINTMENT.—"Sunderland" wishes to know of a good receipt for Pink Ointment, not the Ung. Hyd. Ox. Rub., B.P.

THE PREPARATION OF PURE ZINC BY ELECTROLYSIS.—M. V. Meyers reports ('Comptes Rendus,' lxxiv. 198) that being in want of pure zinc for the production of hydrogen, he succeeded in obtaining it easily and in an absolutely pure state, by the decomposition of an ammoniacal solution of sulphate of zinc by a galvanic current. The positive electrode used consisted of a plate of zinc and the negative of a copper wire in the form of a T. Upon passing a current from two Bunsen elements through the liquid, the copper is soon covered by a layer of zinc, and a tree of crystals of zinc is formed at the extremities of the wire. The crystals, after removal, should be washed with a dilute solution of ammonia.

POTIO RIVIERI.—In the *American Journal of Pharmacy*, Mr. Louis Cohen gives the following formula for a preparation frequently prescribed by German physicians in the United States under the above title:—

Potass. Carb. depur. ʒj
Acid. Citric. gr. lij
Aquæ ℥ij.
Misce.

GUM SYRUP.—In order to obviate the inconvenience attending the frequent preparation of gum-water required for prescriptions, Mr. Dondé recommends the use of a gum-syrup made as follows:—

Gum Arabic, in coarse powder, 2 lb.
Rain Water, 2½ lb.
Simple Syrup, 6 lb.

Macerate the gum in water, shaking it occasionally for six or eight hours, until completely dissolved; then strain. This gives 3½ fluid pounds of mucilage. Concentrate the syrup to 35° Bmé. [sp. gr. 1·321]; remove from the fire, and let it cool to 60° C. or 70° C., and add the mucilage. It yields 8 fluid pounds of syrup, containing one-fourth its weight of gum. If 1½ ounce of this syrup be mixed with 6½ ounces of water, a clear solution is produced, containing 3 drachms of gum.—*American Journal of Pharmacy.*

CARROTINE FOR COLOURING BUTTER.—A writer in *Dingler's Polytechnisches Journal* (cc. 83) recommends carrotine, the colouring matter of carrots, obtained by exhausting the dried and pulverized roots with bisulphide of carbon, as better adapted for colouring butter than anatto, the carrotine being tasteless and scentless.

BOOKS RECEIVED.

ELEMENTS OF CHEMISTRY: THEORETICAL AND PRACTICAL. By WILLIAM ALLEN MILLER, M.D., D.C.L., LL.D.; revised by HERBERT MCLEOD, F.C.S. Part I. Chemical Physics. Fifth edition, with additions. London: Longmans. 1872.

HOW TO COOK. By T. L. NICHOLS, M.D. London: Longmans. 1872.

Correspondence.

**** No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

ELECTION OF COUNCIL.

Sir,—In reply to Mr. Mayhew, I have no change of views to report since last year, when I took an active part in defeating the proposed compulsory regulations. I am as strongly opposed now as then, to any interference with the details of business not absolutely necessitated by considerations of public safety; and on this point it will be remembered there was literally no case,—I doubt whether even recommendations were necessary except as a sort of peace-offering.

If Acts of Parliament are written in the common language of the people, I do not see how the Pharmacy Act, 1868, imposes upon us any statutory compulsory obligation to frame regulations, which as a body corporate we do not deem necessary.

I am not insensible of the honour of a seat in the Council, but certainly do not covet the distinction. I reluctantly accepted nomination on general principles, at the urgent request of our local association, but I agree with Mr. Schacht that the well-being of the Pharmaceutical Society requires that so far as the expression of opinion on the part of the members can determine the matter of the compulsory regulations, it may be disposed of at the coming election.

JAMES BAYNES.

Hull, April 15th, 1872.

Sir,—Finding there is a generally expressed wish that those who have been nominated for the Council of the Pharmaceutical Society should make known their opinions on one or two pharmaceutical topics, I will, with your permission, do so as briefly as possible.

I am strongly opposed to compulsory regulations, believing a man can conduct his own business with greater satisfaction to himself, and safety to the public, by carrying out his own system rather than being forced by law to adopt the novelties of others; and my objections to legislative interference have been strengthened seeing that not one of the 120 gentlemen who signed Mr. Sandford's circular have replied to the letter of Mr. Proctor, of August, 1871, asking for information.

I am in favour of grants for education to the provinces, as I look to education as the true protector of the public.

The difference between pharmaceutical chemist, and member of the Pharmaceutical Society, and chemist and druggist by examination of the Pharmaceutical Society, seems so slight to me in the public mind, that I should be glad to see the whole of the outstanding chemists and druggists by some wise means brought into the Pharmaceutical Society, so as to form a strong and united body with identical interests, considering this would tend to prevent reckless and hasty legislation by the few to the detriment of the many.

Those friends who urged me to allow myself to be nominated for the coming election of Council of the Pharmaceutical Society, knew my views at the time of asking me, but knowing full well that changes have passed over men's minds on these subjects in a few weeks, I wish to record that if my brother pharmacists consider me worthy of a seat on their Council Board, holding these opinions; if I change them I shall deem it only a common act of honesty to retire at once, rather than continue to sit on the Council Board to oppose the views of those friends who placed me there.

W. W. URWICK.

60, *St. George's Road, Pimlico, London.*
April 16th, 1872.

MISTAKES IN DISPENSING AND PRESCRIBING.

Sir,—In reference to the deplorable case of poisoning by misadventure, for which a chemist's assistant was tried for manslaughter at Devon, as reported in the PHARMACEUTICAL JOURNAL, March 23rd, it might not be out of place to ask your readers if they have ever met with the term Sal. Morph. as applied to the salts of morphia. I have never met with it, and as you justly remark, such a term is not used, although Sol. Morph. (solution) is very common. A similar case of poisoning by which a colonel lost his life in consequence of the chemist's assistant dispensing six grains of one of the salts of morphia instead of six minims of its solution, must be fresh in the memory of most of your readers. It occurred in one of the western towns a few years since, and bears a remarkable analogy to the present case, as the accused on his trial pleaded that he read Sol. Morph. as Sal. Morph., or salt of morphia.

As it is well for all your readers to profit by the experience of others, I will mention a case occurring in my own practice. A prescription was sent to me to dispense, commencing, Morph. Acet. ʒss, and other ingredients to form a composing draught to be taken in two doses! My assistant and myself conned the prescription over, and considered it unsafe to deal with it without further instructions. Fortunately, I had no occasion to apply to the patient, as the writing and initial of the physician were familiar to me. I shall never forget the deathlike pallor of his countenance as I put the prescription into his hand. I thought he would have fallen; he said he had intended it for half a grain; probably he intended ʒss of the solution (P.L.) as it was before the injudicious alteration of the strength of solution of morphia in the new pharmacopœia, which I know prescribers frequently overlook, so that the patients only get half the dose intended.

A Chemist.

Benevolent Fund.

Sir,—My attention having been called to the Benevolent Fund by the circular issued by the Secretary, I will, in the interests of the Society, tell you why I am not a subscriber to it.

Let us first look at the facts and figures as a whole, and then treat them in detail. The present capital is stated to be £12,000, invested in Consols, and yielding a yearly income of £360. The subscriptions and donations for 1871 amount to about £527. Relief granted during 1871: annuities £347. 10s., and temporary grants £77, making a total of £424. 10s. The circular states there are now thirteen annuitants, each receiving £30 per annum, making a total of £390.

"The mountain in labour brings forth the mouse." In a leading article in the Journal of January 6th, the writer rejoices that we have £12,000 capital, which, he says, provides for twelve annuitants, but there are thirteen, and the only way to maintain the thirteenth annuity is to provide another £1000.

I should rather have rejoiced had the money been distributed in past years to relieve the objects for which it was subscribed. After the lapse of thirty years, all that is done with the Benevolent Fund is to relieve twelve people by annuities, and seven by temporary grants, and to rejoice that no more is being spent.

It is time an end was put to this system. The reserve fund ought not in such a society to exceed the amount of five years' expenditure; and with the exception of large sums arising from legacies and special donations, the whole of the yearly income should be divided amongst the deserving applicants for relief.

You appeal to the members for further subscriptions, and say, practically, that out of every guinea you are prepared to apply sevenpence farthing per annum to purposes of benevolence. You are amazed that members are not more willing to subscribe money on these terms. You say you want £1000 to relieve one person with £30 a year. You prefer relieving one person in perpetuity, to relieving thirty-three people with the same sum for one year. You have no faith in the future, and therefore you deal with the money you have as though you were never likely to get any more! But how do you deal with the money which you have? That is my second point. Why is it invested in Consols, rather than in good securities yielding a higher rate of interest? There are Indian Railways with Government guarantee of 5 per cent., which at present prices will yield you more than $4\frac{1}{2}$ per cent., and thus your interest may be increased from £360 to £540; and your annuitants from twelve to eighteen, by a mere stroke of finance. There are other modes of investment, such as Railway Debentures, Mortgages, etc., which the Court of Chancery will tell you are available to trustees, and which will yield as much or more.

Now, then, supposing the present capital were to be left intact, and invested at $4\frac{1}{2}$ per cent.; and the subscriptions and donations for 1872 were to be the same as in 1871, you would have £540 + £527 = £1067, which would give £30 each to thirty people, and leave £167 for temporary relief.

I hope this subject will claim the careful consideration of the members, and that at the Annual Meeting some resolutions will be passed to deal with this fund in some such way as I have suggested, which would, I have no doubt, materially increase the number of subscribers, as it will be felt that whatever sum is subscribed, is applied direct to its legitimate purpose of relieving the distressed.

H. Scholefield.

Newcastle-on-Tyne, April 12th, 1872.

The Council and Provincial Education.

Sir,—The unusually full report which you were good enough to give us of the proceedings of the last Council meeting, must have been read with interest by many, both the subjects discussed being of great importance to country chemists. With regard to the question of grants to provincial associations, I venture to suggest that some such system as that proposed by Mr. Schacht in the Journal of Nov. 18th, 1871, deserves more attention than appears to have been yet bestowed on it; at all events, some system of payment by results. Possibly, for the present, the simplest, if not the best plan might be for the Council to decide annually, as advised by Mr. Frazer, how much it can afford to devote to this object, and then to make to provincial associations grants bearing some definite proportion to the incomes collected locally by these associations; a stimulus would thus be given to local effort, and the principle of helping those who try to help themselves would be fully carried out. It might be necessary to recognize only such associations as could provide suitable rooms, etc., and certain prescribed courses of lectures. It does not appear to me desirable that these proposed grants should be devoted to the reduction of students' fees, but rather to the perfecting of the educational appliances of the association. I feel convinced that provincial Schools of Pharmacy will become necessities of the future, and the development of really efficient institutions is an object worthy of the attention and hearty support of our Pharmaceutical Society.

F. Baden Benger.

Market Place, Manchester.
April 13th, 1871.

Apprenticeship System.

Sir,—Although I cannot hope to add much to the value of Mr. Atkins' remarks upon "Apprenticeship," published in the number for March 30, I am unwilling to let the occasion pass without adding my testimony to the portentous importance of the subject. Mr. Atkins speaks of it as having already given rise to much discussion, both in the columns of the Journal and in the transactions of the Conference, but I am more astonished at the prevailing indifference with which a question so rife with disaster to the future of pharmacy is generally regarded.

It is dangerous to assume the oracle, but I challenge the judgment of ten years hence upon the prediction that the present disorganized state of the apprentice system must end in collapse. Unless it is speedily amended, there must be a break-down in the supply of Pharmaceutists qualified according to law for carrying on the business of pharmacy in England.

A new order of things has, as Mr. Atkins states, deterred many from prosecuting the trade of druggist by dread of the ordeal designed for the protection of pharmacy, but applicable in this country to both, and therein differing from Continental usage. Mr. Atkins also quotes the known and significant fact that the really capable teachers decline the responsibility of teaching; and they will be likely to do so until this responsibility is more clearly defined and restricted within reasonable limits. Men of character do not undertake that which they well know it will be impracticable for them to fulfil. In the meantime Pybus seeks refuge and instruction with Horner, and qualifies himself for dispensing strychnia and prussic acid by grinding cart grease. One does not easily recognise the aptitude of the means to the end, but does Pybus himself appreciate the gravity of the end with sufficient clearness to accomodate himself to the exigencies of appropriate means?

I am not even sure that Mr. Atkins and myself take exactly the same views as to the ultimate shape into which the apprenticeship chaos should resolve, but I cordially agree with him in thinking that pharmaceutists on the one hand, and parents and guardians on the other, need to be educated up to an intelligent understanding of the new relations which masters and apprentices must assume to each other, and to the ceremony of initiation into the art and mystery of Pharmacy.

I must incur the reproach of repeating my own advice, more coherently expressed upon former occasions (for the apprentice difficulty was a subject of anxiety to me as long ago as when I used to discuss it with the late Jacob Bell), and again insist that a pharmaceutical apprentice must in future be dealt with by both parties to the bond as a pupil whose term of instruction is designed solely for his own advantage, and whose services cannot be reckoned as available to any useful extent for his master's profit. Scientific instruction is now absolutely and compulsorily necessary—it must be obtained from the proper sources, viz., from competent professors. Practical and technical experience is also requisite, and the theoretical teaching must therefore be supplemented by the pupil having the run of a pharmacy* where he may become expert in the operations which it will be his duty to perform in his subsequent career as assistant and master. But it is absurd to expect (and hard facts have demonstrated the absurdity) that the master of any pharmacy, with sufficient business to afford these means of instruction, is going to worry himself, or sacrifice an important amount of valuable time in the personal superintendence of an apprentice for a totally inadequate consideration. With genuine sympathy for Pybus and real anxiety about the system which he illustrates, I have quite determined not to undertake him upon these terms, and I believe my judicious friend, Mr. Atkins, has arrived at the same conclusion.

RICHARD W. GILES.

Clifton, April, 1872.

Sir,—The ill-used and ill-educated apprentice!—Such is now the cry in the Journal. No one has hitherto said a word on behalf of the frequently ill-used master.

Most of your correspondents appear to think that the ignorance of the apprentice is owing entirely to the neglect or incompetency of the master. In many cases no doubt the accusation might be justly made. But, in my opinion, the following three causes have also their influences:—

1. The deficiency of the education of the youth previous to his apprenticeship.

2. The placing a youth in a shop where a trade is part druggist, part grocer, part wine-merchant, and part general dealer.

3. The general disinclination of the youth to apply himself, after his business hours are over, to any kind of study whatever.

In discussing these causes, I shall also say a few words in defence of the country druggist.

The first cause admits of easy remedy. Compel every youth to pass his Preliminary examination before being apprenticed; and, like the Apothecaries' Society, let his indentures be recognized at his future examinations. The curriculum of the "Preliminary" will also bear a gradual elevation.

This resolves itself more into a private and financial matter than one coming within the scope of any society's interference. I apprehend that the reason why youths are placed as apprentices to learn various trades is, that they may have such a training as will enable them to get a living for themselves. Many people living in the country in the class of society from which tradesmen are usually drawn, are not in a position to pay heavy premiums in order that youths may be placed in pharmacies as pupils. But as there are different classes in society, so also in the drug trade are there found many classes of businesses and of tradesmen differing widely from each other; and if a youth cannot commence his business life at Savory and Moore's, or Bell's, there is no reason why he should not commence in a humbler sphere. It is thus the miscellaneous druggist becomes to many a useful being, as he enables a youth whose principal drawback is his parents' poverty, to follow a trade upon which he has set his heart. This class of druggist then, who keeps open his shop, not for experimental and fancy pharmacy, but for the vulgar purpose of getting a living, is thus supplied with a youth to assist him. The pharmaceutical instruction may be very limited, but so is the premium. Still there is nothing to prevent such a youth, if he possess ordinary diligence and good conduct, acquiring good business habits and learning how to live. And that youths so instructed have afterwards proved themselves good men of business, and good pharmacists also, we have many living examples now to prove. For the idle and discontented, the guineas premium and elaborate pharmacy would do no better. And as the talented pharmacist is not condemned for his pupil-dunces, why condemn, unheard, the country druggist for his ignorant apprentices? I deplore the ignorance of apprentices as much as any one, but contend that we have no right to condemn *in toto* this class of tradesmen as being the cause of it. The contract of apprenticeship is so frequently prompted by motives of economy, the youth's friends being desirous of finding a home for him for five years and a cheap mode of learning the trade, and the master's object being cheap labour, little scientific knowledge may be imparted; but little if any, in many cases, is even expected. The theory of high pharmaceutical training is at present incompatible with the routine of the generality of country businesses.

In these luxurious times, the temptations of pleasure and dissipation have with many youths greater influence than the inducements to obtain knowledge; and the minds of such youths are more absorbed by the speculations of how they can enjoy themselves in their spare hours, than in any endeavours to improve their mental status. Apathy for intellectual pursuits is quickly succeeded in many cases by a positive distaste for anything like mental labour. The instruction given by the master to his apprentices during business hours, whether such instruction comprise the duties of the shop or the work of the laboratory, will be of little avail for scientific purposes, unless supplemented by systematic and persevering study after the day's work is over. But when the overtures of the master to instruct are declined by the apprentices, as is frequently the case, who is to blame? Apprentices may be dragged through their work, but they cannot be compelled to study.

Thus we have seen that the well-educated schoolmaster-pharmacist, as well as the miscellaneous druggist, may turn out equally ignorant apprentices, without being in any way able to prevent their ignorance.

In conclusion, I cannot refrain from expressing my regret at the tone that has been given, in various contributions to the Journal, to such petty and sensational questions as drudgery, shop opening and closing, shop sweeping, etc. I speak advisedly when I say that such remarks have in many cases an injurious tendency upon the minds of certain apprentices, particularly those of unaccommodating dispositions and indolent habits. They are, upon the slightest grievance, apt to fancy themselves martyrs, brood over their supposed injuries, and as one scabbed sheep makes many, discontent is frequently contagious.

Let a little more of the milk of human kindness be shown in these discussions, and instead of division, let a necessity for fusion be encouraged throughout the trade. To be powerful, instead of uncharitable reflections, we each require the moral support and assistance of the other, though our incomes and habits may differ as greatly as one star does from another in brightness.

A COUNTRY PHARMACEUTICAL CHEMIST.

APPRENTICES: A PLEA FOR WEAK BRETHREN.

Sir,—The Pharmacy Act has had the effect of leaven or ferment on the body pharmaceutical, and is causing to be eliminated from it many morbid elements; and the gaseous and effete matters, which rise to the surface every now and then, in the form of controversies and discussions on questions of law and policy, are of considerable value, inasmuch as they tend to settle such questions on something like a solid basis.

At present there is a lively effervescence on the apprentice question going on in the columns of the Journal, which indicates the meritorious interest felt for the apprentice of the future; but as some of the writers appear to draw the line

* It may be necessary to state that the term "Pharmacy" is understood to comprehend a laboratory and shop, in the latter of which dispensing as well as retail business is performed.

rather too tight, I have given way to a desire to make a few remarks on the subject.

When a man takes an apprentice, he undertakes to teach him the business he himself follows, in the way he himself conducts it, whether the business be that of a pharmaceutical chemist or a tailor; and I hold, that neither in law nor logic is there any other obligation upon him, unless specially stipulated. No man can teach what he does not know; and comparatively few people know the abstract principles of their own business. By way of illustration I will take the tailor. He shows his apprentice how to sew and to make clothes, but he does not enter upon a discussion, every day or so, on the abstract principles of symmetry or of fashion. Then how is the young man to get to know this? Well, by the application of his own thoughts to the subject, by observation and by practice, both of which his master gives him the opportunity to exercise.

Does the medical practitioner teach his pupils anatomy, or physiology, or the abstract principles of medicine?

Are not all medical pupils much in the same position as our own, when their articles expire?

Are the articled pupils of solicitors in any different position?

There are many businesses where two or three assistants, and one or two apprentices are employed. The principal of such an establishment is probably busy all day long, either in the shop or out of it, with business—domestic, social, or municipal. How is it possible such a person can give oral instruction to his apprentices?

We have in our own profession [?] men who are highly cultivated, and follow some branch of science in connection with their business, either for love or profit. The subject may be microscopy, chemistry, or botany. Is such a one bound by any consideration to teach this to his pupil?

I don't think it necessary to continue these remarks further, to enforce the moral or the conclusion. To do that which has often been suggested by writers on this subject, is neither practicable nor beneficial. It is the duty of the apprentice to endeavour to acquire a knowledge of those branches of science that are necessary to enable him to pass the examination he knows he must pass, as well as to enable him to conduct his business satisfactorily. He can do this, by reading during his apprenticeship, to a great extent. If he has the opportunity of attending lectures, so much the better. But in these days of luxury and ease, we are constantly hearing the remark "How can it be expected that young men can begin to study at night after business hours?" I can only say in answer, that "Where there's a will, there's a way;" and it would be much to their benefit if young men would try to find both. The subjection of the will, and the bending of the mind, to the attainment of this object, would be a discipline well worth submitting to.

F. M. Rimmington.

Bradford, April 2nd, 1872.

Pharmacy in the Shop.

Sir,—There is no denying the fact that the practice of pharmacy has not in time past, and does not even now, obtain from chemists and druggists the consideration it deserves, either in an educational or economical point of view. As regards the past, the reason is tolerably plain, for with our predecessors the absence of the requisite skill and knowledge was as general as the possession of it ultimately will be with our successors. Formerly, the trade of a druggist (I think we may here sink the "chemist") was, generally speaking, nearly as mechanical as any other; I say generally, for with the exception of a small minority of clever, practical men, who were chemists indeed, as well as druggists, and who have left behind them an example for all times, the trade was by no means in an advanced position. As regards the present, it is in a transition state, and the druggist of the past is being gradually replaced by the more accomplished pharmacist of the present, so that before long, as a matter of necessity, the practice of pharmacy and the science of chemistry will hold a far stronger position than heretofore, the advantages of which are too patent to call for remark. This communication is more immediately concerned with the present, and especially with the practice of "Pharmacy in the Shop," as distinct from "pharmacy in the Laboratory," so ably treated by a well-known contributor to this Journal, in a recent number. Years ago, when I was a novice in the mysteries of the drug trade, the question frequently occurred to my mind, why certain preparations, easily made, were almost invariably bought instead; this question when framed into words, received, also as an invariable reply, "It does not pay." Well, granted that, under the then existent circumstances, this excuse in a great measure held good, still it cannot apply with equal force now, though many think it does, when we consider the vastly superior education obtained by our present race of pharmacists; and especially since the publication of the present edition of the "Pharmacopœia," which, to a very great extent, has simplified and improved the different processes, thus making the practice of pharmacy intelligible to any one who has the requisite desire, and will take the trouble to make himself acquainted with it.

Apart from the hard and fast question of "Will it pay?" this science, as an educating power, is of much importance, and may be turned to advantage in the instruction of our juniors, as is evidenced by the interest they generally take in any pharmaceutical process out of the common way; this view of the subject has been so ably advocated by the writer before alluded to, that I can safely leave it where it is. The question I wish particularly to bring before my pharmaceutical brethren is, "Does it pay?" I hope to be able to show that it does, while my own experience also answers in the affirmative; of course, I presume that the requisite skill and knowledge will always be brought to bear on the subject. In very few pharmacies indeed is there such a continual round of business as to leave no time for the manufacture of pharmacopœia preparations other than the most simple; in most of them, there is some part of the day, or week, or season, when business is slacker than others, and it is by catching and utilizing these opportunities, that practical pharmacy becomes in one sense a paying occupation. Again, there are very few pharmaceutical preparations that require a long continuance of unremitting attention, so as to prevent the operator being otherwise engaged for even the shortest time; most of those in which I have been concerned, and they are not very few, have permitted me to attend to the requirements of customers and the necessities of dispensing, without any unusual trouble. These operations have, with one exception, all been conducted in the shop, amidst the daily wants of a middle-class pharmacy, giving occupation to many spare hours, and occasional rainy afternoons, besides proving profitable in more senses than the strictly commercial. Another advantage gained by the practical pharmacist is that he is enabled to guarantee the strength or purity of his own preparations when called on to do so. As examples of such as may be made in the shop, while attending to ordinary business, I find in my laboratory book entries of the following, which I select, as being usually bought instead of made at home:—

Liqs. Ferri Perchlor. and Persulph.
Liqs. Potassæ and Sodæ.
Acid. Hydrocyanic Dil.
Antim. Tartrat.
Ferri Phosphas.
Syr. Ferri Iodidi., Ferri Phosph., and
 Syr. Ferri Phosph. tonic (Easton's).
Hydrarg. Cyanid., and Oxid. Rubr.
Spts. Ether. Nitr., and Ammon. Arom.
Ung. Hydrarg. Nitrat.
Emp. Ammoniaci cum Hydrarg.
Oxymel Scillæ.
Exts. Opii and Glycyrrhizæ.
Adeps. ppt. and Benzoat.
Concentrated Infusions, etc.

My apparatus for the manufacture of the above consists of retorts, glass and tin plate, receivers, flasks, Liebig's condenser, sp. gravity bottle, hydrometers, and thermometer, retort stand, Bunsen's and ring gas furnaces, about one dozen evaporating basins or pans, and a few trifling accessories. Gas and water are laid on close at hand. Nothing very costly here, but all efficient and quite handy; no fixtures being used, the apparatus is put away when done with; by the exercise of a little care the breakage is almost *nil*, and it may reasonably be expected that the skill and common sense of the operator would prevent such a catastrophe as a "blow up." The counter space occupied by the above is small, and the *modus operandi* is such that I can see all going on in the shop and attend to the processes at the same time. In the list of preparations above, there is, as I have before stated, an exception: the Liq. Ferri Perchlor. has to be made in the kitchen; the gas furnace and basin being placed under the chimney, all the vapours are effectually carried off. I should advise no one to attempt the manufacture of this article in the shop, or they will most certainly regret it, supposing the shop to contain anything that will spoil, as marble slabs, brass scales, etc. To a practical pharmacist, a laboratory book will be found most useful; in it should be recorded the date and quantity of each preparation made, and if desired, the cost for which it could be produced. From my experience in the manufacture of these preparations, I find that I can save on some 30 per cent., on others 50, and on a few, even a larger per centage of the cost as compared with the prices of wholesale houses, besides being perfectly satisfied that they are correct in every respect, and exactly what they are represented to be.

I have endeavoured to show that the absence of a regular laboratory with its costly appliances need not be a hindrance to the acquirement of a knowledge of practical pharmacy, or an excuse for the absence of such. If the pharmacist has but a moderate amount of room, a few well-selected pieces of by no means costly apparatus, a fair amount of skill and common sense, combined with a reasonably patient temperament, he may hope to go a good way beyond what I have stated, with pleasure to himself and profit to his business.

Liverpool, April 1st, 1872. T. H. Hustwick.

The Sunday Duties of Chemists' Assistants.—To what Extent are they Expedient?

Sir,—I shall esteem it a favour if you will allow the following lines a place in the next issue of the Pharmaceutical Journal. As they pertain to a subject affecting the majority of assistants throughout the country, their insertion may induce others more able than myself to advocate its claims.

To attempt to prove that provision need not be made to meet the requirements of the public at all times in cases of emergency would at once betray a sad unconsciousness of one's duty, but to endeavour to modify the present system, and secure to assistants those privileges which it is right they should enjoy is quite another thing.

The subject at once resolves itself into one or two questions.

1st. Do the requirements of the public render attendance necessary at every dispensing establishment on Sundays? and if not—

2nd. Cannot some plan be adopted whereby such requirements may be met without unnecessary confinement?

The consideration of the first question immediately suggests another. Within a radius of a mile of where I am living, there are no less than twenty dispensing establishments, at each of which (if I mistake not) attendance is given during the whole of the Sunday. I ask is this expedient? Can it be reasonably urged that the probable cases of emergency demand it? and if not, is it not due to assistants upon whom so many duties are incumbent that every possible concession should be made? I believe that the admission of the majority of employers, and the testimony of assistants generally, would show that (as a rule) attendance at one establishment in ten would be quite sufficient to meet every requirement which the just claims of emergency may have upon us; and my own experience differs very widely from that of others if more than 25 per cent. (and here I think I am far above the mark) of the business usually transacted on the Sunday can consistently be called "cases of necessity." How often does it happen that, after remaining in the whole of the day, the actual requirements have amounted to an ounce of delectables and a bottle of soda-water, or they may occasionally extend to a sedative mixture some elderly customer is in the habit of taking every night, and a repetition from a well-known prescription dispensed regularly about twice a week? That such is often the case will be confirmed I am persuaded by hundreds of assistants who, like myself, continually endure the unwholesome confinement that an unnecessary custom imposes upon them. Without adverting to the Sunday cases of "abominable Sunday traffic" carried on under the false pretext of the claims of emergency (where the contents of the till on a Sunday might represent an average day's business), it must be admitted that the present "staying-in" system is to a very great extent unnecessary, and deserves the serious consideration of all interested in the pharmacists' welfare, affecting as it does both employers and employed.

In dealing with the second question, however, greater considerations are involved, and one is reminded that it is far easier to speak of existing evils than to provide a practicable remedy for them. Difficulties will doubtless arise, but I am loth to believe they are insurmountable; and if there is just cause for an appeal against the present unnecessary confinement, surely it behoves those by whom such claims are respected to espouse that cause, and by personal effort endeavour to bring about that reformation which is so sadly needed, and which would be attended with so many privileges.

But can it be done? and if so, how? for after all the whole matter hinges upon this question. I believe that in America it is done, and upon a principle that might be adopted at home. I have been given to understand that provision is made according to the requirements of the neighbourhood. For instance, in a town in which there are, say twenty establishments, attendance is given at perhaps two during the whole of the day, each taking duty in succession; thus, instead of remaining in every Sunday it is only necessary about once in two months, and I would humbly suggest the advisability of endeavouring to establish a similar plan. Of course no uniform method could possibly be adopted, a great deal being dependent upon the position and requirements of the neighbourhood.

It is not difficult to anticipate many objections that would be made, but I fail to see any that can consistently be urged; and since the law requires a standard qualification from every proprietor, it can be no wrong to the public, if, in cases of emergency, they are referred to the registered chemist upon whom the duty then falls.

Much has been done lately towards promoting a more fraternal feeling amongst employers. Let this be not in word only but in deed, and the greatest obstacle is removed. A discerning public would not fail to recognize the justice of our claim. A little forethought would lead to the purchase of known requirements on Saturday, and thus the benefit be shared by all whom it would affect.

To cherish feelings of self-pity or to endeavour to sow seeds of dissatisfaction amongst fellow-assistants, are, of all things, most blameworthy, but by rational means to contend for a concession of privileges that might be so easily granted, deserves the hearty co-operation of all to whom the pharmacists' welfare is dear. Nemo.

G. C.—A beam of common light consists of undulation of the luminiferous ether; these undulations, or wave motions, taking place in all conceivable directions transverse to the line of advance, or the path of the ray. Certain substances, as Iceland spar, only allow of the propagation of these wave motions in two directions, and that in paths lying separate. A beam of common light entering such a substance is bifurcated or doubly refracted, and leaves it as two beams, the undulations of the one being at right angles to the other. In your Nichol prism, provision is made that one only of these shall pass out, the other being shunted off by total reflection. Such a beam as that which passes through the prism is a beam of plane polarized light, and its plane of vibration is the plane of primitive polarization. A little reflection will show that it can only pass through a second Nichol, when its planes of vibrations are in accordance with that of the prism. But the beam of plane polarized light is also capable of being doubly refracted. If a plate of selenite or other doubly refractive substance be interposed in its path, having its axis inclined 45° to the plane of primitive polarization, it will be split into two smaller beams, the planes of which will be at right angles to each other, and inclined at an angle to the plane of primitive polarization. If you fix your eye upon two such vibrating planes, you will see that a second prism would resolve or analyse these into two beams,—the one vibrating at right angles to the original plane, the other in that plane; the one passing through the analyser, the other being stopped by it. It is not possible to go into details here. If you desire to pursue the subject, you will find Dr. Pereira's lectures, delivered before the Pharmaceutical Society, published in the first series of this Journal, Vols. II. and III., and Sir John Herschel's Lectures on Light (*Good Words* for 1865, reprinted in his "Familiar Lectures,") of service. The phenomena can be easily understood if you be familiar with the working of the doctrines of the resolution of forces.

Communications, Letters, etc., have been received from Mr. Scholefield, Messrs. Kay Brothers, Mr. Chipperfield, Messrs. Thorne Brothers, Mr. J. R. Jackson, Mr. W. H. B. Hamilton, Mr. Rayson; Mr. W. Wilkinson, Mr. S. B. Holgate, W. F. C., J. F. F., "Dominus Salus Mea," "A Student."

In consequence of want of space the answers to several communications are deferred.

GONOLOBUS CUNDURANGO.

BY M. TRIANA.

In a note by this celebrated botanist, presented to the Académie des Sciences at the sitting on the 25th ult. by M. Roulin,* some interesting particulars are given respecting this plant, which has recently gained so much notoriety as a new therapeutic agent and alleged remedy for cancer.

The author states that it is not as a remedy against cancer that the cundurango plant formerly figured in the popular medicine of South America; but, that in common with other plants of the same country, the Guaco, the Matos, etc., it was looked upon as an antidote to the bites of serpents. This kind of wound, apparently so trifling, being in most cases followed by death, it is not surprising that the discovery of substances that pass for antidotes should everywhere in popular opinion be surrounded by the marvellous; but it is worthy of remark that in most places the legends bear a resemblance to each other. They generally state that some animal which hunts these reptiles has recourse to a certain plant to heal the wounds and neutralize the venom. Thus, in the Magdalena Valley and in the mountains that bound either side, it is a heron, called the "guaco," that heals itself with the leaves of a composite plant that Humboldt and Bonpland have named *Mikania Guaco*. Still in New Granada, but in the vast plains which extend to the east of the Cordilleras of the Andes, it is a small mammifer that obtains the same result by gnawing the tuberculous roots of an Aristolochia known to the natives under the name of "matos." Lastly, in Ecuador it is the condor which employs as an antidote to the venom of serpents the leaves of a species of *Gonolobus*, called for this reason "cundur-angu," or the vine of the condor.

Some of the species of the genus *Gonolobus* are looked upon by the natives as virulent poisons, and it was in consequence of this belief that its repute as a remedy for cancer had its origin. It is said that a Loxa Indian woman, wishing to poison her husband, perseveringly administered to him an infusion of this plant, but instead of causing his death, he was healed of a cancer from which he had long suffered. It appears to have been this story, become legendary, which suggested to Dr. Eguiguren, physician and brother to the Governor of the province of Loxa, the idea of trying cundurango in cancerous and syphilitic affections. It is asserted that these trials were completely successful, and that, afterwards, the governor himself, having occasion to visit Quito, obtained an equal success with several other persons. The President of Ecuador, Don Gabriel Garcia Moreno, informed of these cures, especially those that had taken place in the hospitals of the city, thought it to be his duty to give them greater publicity, in order to call the attention of the American and European Governments to a discovery which, if confirmed, would give to the native country of the cinchonas a fresh title to the gratitude of the world. Consequently, he distributed to friendly Governments, through their diplomatic agents, ample supplies of the cundurango wood, with a request that they would submit them to the examination of physicians, botanists and chemists.

M. Triana was in this country when the English Government received, and transmitted to Kew for determination, the specimens of cundurango. These were shown to him, but he was unable to recognize by mere pieces of stem a plant that he had never before seen. He was, however, inclined to doubt the anti-cancerous properties attributed to it, remembering that in America the name cancer is applied sometimes to syphilitic or gangrenous ulcers which might be ameliorated or cured by some of the plants contained in the popular medicine of the country. These doubts were, however, somewhat modified upon reading the circumstantial accounts of cases treated in America.

In consequence of the great interest which the subject excited in the Central American States, M. Triana, as a Columbian, thought it to be his duty to make a botanical investigation of this interesting plant; and, although not claiming to speak decisively upon the medical question, he thinks he is justified in saying (1) that some of the symptoms of cases described as being successfully treated in America could only have belonged to cases of cancer; (2) that supposing diagnostic error on the part of the physicians, it is sufficiently well established that serious maladies have been healed by it; (3) that judging by analogy from other asclepiadaceous plants in the genera *Calotropis*, *Cynanchum*, and *Tylophora*, etc., there is reason to suppose that the plant would possess depurative and antisyphilitic properties.

The author acknowledges that in Europe the cundurango has only given hitherto negative results in well-characterized cases of cancer. But he considers that before this experience be taken as decisive it is worthy of inquiry whether the experiments have been made in both countries under the same conditions. Is it certain that the plant in drying does not lose much of its activity? Or is it not possible that in the consignments of cundurango various species of *Gonolobus* have been confounded? Some time since specimens of wood, leaves and fruit had been submitted to him as cundurango, which he had no difficulty in recognizing as belonging to a species of *Macroscepis*, collected by himself in the warm region of Magdalena, and named by Decaisne *M. Trianæ*.

The author states that the plant has close affinity with *Macroscepis*, to which genus however it cannot be referred, in consequence of its corolla, described as being rotate. The same character separates it from *Fischeria*. At Ecuador it was thought to be an *Oxypetalum*, but that genus has smooth fruit, bifid styles and linear petals, characters entirely distinct from cundurango. There remained, therefore, in the group of *Gonolobeæ* only the genus *Gonolobus* itself; and upon examination of the specimens of fruits and leaves at the office of the Ecuador consulate all doubt disappeared, for it was found that the first are follicles with longitudinal ribs, and the latter cordate and deeply emarginated, as in the generality of species of *Gonolobus*. The author, however, considers it be a new species, to which he has given the name *Gonolobus Cundurango*. Many other species of *Gonolobus* found in the tropical zone of America probably possess similar medical properties, but before their respective therapeutic value can be decided, it will be necessary to avoid confounding them. The following is M. Triana's diagnosis of the species:—

G. Cundurango, ramulis sulcatis, petiolis pedunculisque pube gricea indutis, foliis longiuscule petiolatis cordatis sinu lato cuspidatis supra puberulis, subtus cinereo tomentosis mollibus a basi 5-nerviis folliculis ovato-oblongis ventricosis 4-alatis glabris.

* Comptes Rendus, vol. lxxiv. p. 879.

VESICATING INSECTS.

BY M. C. COOKE, M.A.

(*Continued from page* 823.)

X. Asiatic and American Meloeidæ.

The single Asiatic *Meloe*, of which we have any record as an acknowledged vesicant, is the Indian *Meloe trianthema*. Another species has had some reputation in North America, whilst we have memoranda of four that are used in South America. These are all that we are aware of that have enjoyed any repute in ultra-European countries.

Doab Blister-fly, *Meloe trianthemæ*, Flem.; antennæ moniliform, tapering upwards, black; head gibbous, broader than the thorax, inflected, black, minutely punctured; thorax ovate, rounded, shining black, with a steel-blue gloss, minutely punctured; wings length of the elytra, brown, transparent; abdomen, sides of a vivid orange-red, with a line of small black dots, one on each segment; the dorsal line and rest of the body nearly of a Prussian blue; legs black, the tibia terminated with two slender spines, the tarsi of the hinder legs three-jointed, the rest four-jointed. The female is nearly twice the size of the male.—Fleming, Catalogue Ind. Drugs, p. 59, 8vo, Calcutta, 1810.

This fly Dr. Fleming says he believes for medical purposes to be fully equal to the Telini fly (*Mylabris cichorii*). "We are indebted for the knowledge of it," he says, "to Dr. Adam Burt, who discovered it in the fields around Muttra, when he was superintending surgeon of that station in 1809. It abounds in every part of the Doab, and in the districts on the right bank of the Jumna, which is fortunate, as the other species (*M. cichorii*) is less frequently met with in that quarter of the country. The insect appears early in the rainy season. It is seldom seen on the wing, but generally running on the ground, particularly in fields overrun with the common plant *Trianthema decandra*, called by the natives Bis-copra, which probably furnishes it with nourishment, though it is sometimes observed feeding on the flowers of *Solanum melongena*. The orange-red colour of the abdomen, with the black dot on the segments, form a good discriminative specific character."

Dr. Burt having discovered the property which this insect possesses of being a safe and efficacious epispastic, recommended it as a substitute for the Spanish blistering-fly, and by his meritorious exertions, the use of it has been introduced in all the hospitals of the upper provinces. Fleming also adds that during August and September a supply of this insect was gathered sufficient to serve the two medical depôts of Agra and Cawnpore for twelve months.

Narrow-necked Oil-beetle, *Meloe angusticollis*, Say; thorax narrower than the head; elytra and abdomen violaceous.—Say, Entomology, iii. p. 166; Harris, Insects injurious to Vegetation (1862), p. 140, fig. 65.

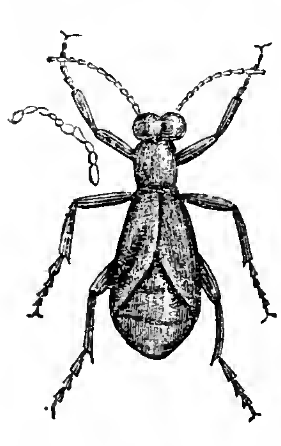

Fig. 21.—*Meloe angusticollis*.

Body dark violaceous, punctured. Head with very deep punctures, an impressed, longitudinal, abbreviated, acute, frontal line; and a transverse, elevated, obtuse one connecting the bases of the antennæ; thorax slender, narrower than the head, profoundly punctured, widest rather before the middle, and narrowed at tip and base. Base emarginate, and slightly margined. Elytra rugulose, dark bluish violaceous. Feet slightly heavy, spines of the tibia and nails ferruginous. Abdomen slightly rugulose, dark greenish, or violaceous; tergum each side black, opaque.

Inhabits Pennsylvania.

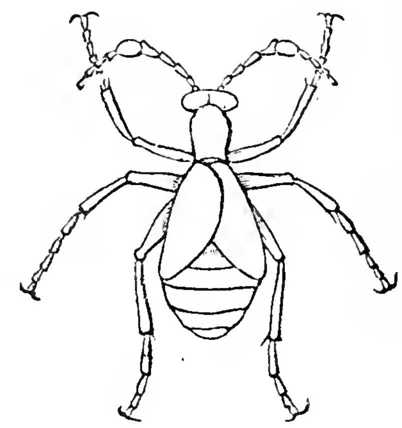

Fig. 22.—*Meloe angusticollis*, male.

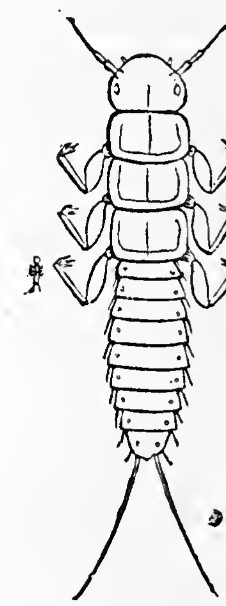

Fig. 23.—Active larva of *Meloe*.

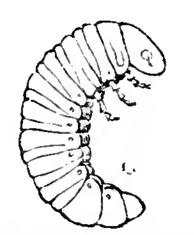

Fig 24.—Second larva form of *Meloe*.

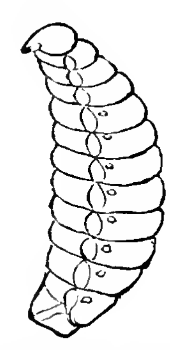

Fig. 25.—Third larva form of *Meloe*.

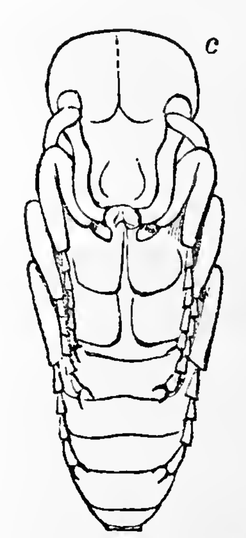

Fig. 26.—Pupa form of *Meloe*.

The remarks of Dr. Packard on this species will serve to illustrate the *Meloeidæ* generally, and explain the changes they undergo:—

"The Oil-beetle, *Meloe angusticollis*, Say (fig. 22, male, differing from the female by having the antennæ as if twisted into a knot; fig. 23, the active larva found on the body of the bee), is a large dark blue insect found crawling in the grass in the vicinity of the nests of *Andrena* and *Halictus* and other wild bees in May, and again in August and September. The eggs are laid in a mass covered with earth at the root of some plant. During April and early in May, when the willows are in blossom, we have found the young recently hatched larvæ in considerable abundance, creeping briskly over the bees, or with their heads plunged between the segments of the body, greedily sucking in the juices of their host. Those that we saw occurred on the humble-bee (*Halictus* and *Andrena*), and various flies (*Syr-

phus and *Muscidæ*), and there is no reason why they should not infest the honey-bee which frequents similar flowers, as they actually are known to do in Europe. These larvæ are probably hatched out near where the bees hybernate, so as to creep into their bodies before they fly in the spring, as it would be impossible for them to crawl up a willow-tree ten feet high or more, their feet being solely adapted for climbing over the hairy body of the bee, which they do not leave until about to undergo their strange and unusual transformations."

(*To be continued.*)

THE THEORY OF THE FORMATION OF CHLORAL.

In the preparation of chloral by the action of chlorine upon alcohol, it has hitherto been generally supposed that the reaction, keeping out of view secondary products, proceeded in two stages, the production of aldehyd being preliminary to that of chloral. And the latter body has been considered to result from the direct replacement of three atoms of hydrogen in aldehyd by three of chlorine.

$$\underset{\text{Aldehyd.}}{\begin{cases} CH_3 \\ CHO \end{cases}} \qquad \underset{\text{Chloral.}}{\begin{cases} C\,Cl_3 \\ CHO \end{cases}}$$

Recent experiments by Wurtz and Vogt appear to show, however, that the changes involved in the operation are less simple. They find that by passing a current of hydrochloric acid gas into a mixture of alcohol and aldehyd, the latter fixes the elements of ethyl chloride, and yields the compound—

$$\begin{cases} CH_3 \\ CH \begin{cases} OC_2H_5 \\ Cl \end{cases} \end{cases}$$

This submitted to the action of chlorine in presence of a small quantity of iodine, furnishes a tetrachlorinated body.

$$\begin{cases} CCl_3 \\ CH \begin{cases} OC_2H_5 \\ Cl \end{cases} \end{cases}$$

which is identical with the compound $C_4H_6Cl_4O$, obtained by Malaguti as a product of the action of chlorine upon common ether, and also with the body recently obtained by Henry by acting upon chloral alcoholate with phosphorous pentachloride.

This tetrachlorinated ether heated with water readily gives chloral according to this equation.

$$\begin{cases} CCl_3 \\ CH \begin{cases} OC_2H_5 \\ Cl \end{cases} \end{cases} + H_2O =$$

$$\underset{\text{Chloral.}}{\begin{cases} CCl_3 \\ CHO \end{cases}} + \underset{\text{Alcohol.}}{C_2H_5HO} + HCl$$

Distilled with sulphuric acid, the same compound gave chloride of ethyl and chloral.

Chloral has, therefore, in these experiments been procured from aldehyd, alcohol, hydrochloric acid, and chlorine; and these are just the substances present in the preparation of chloral by operating with chloral upon alcohol.

The presence of aldehyd among the products of that reaction has been proved by Stas, although it can readily be understood that it can never accumulate in notable quantity, inasmuch as it is at once attacked by the alcohol and hydrochloric acid. The water necessary is supplied, independently of that which may be present in the alcohol, by the reaction of the hydrochloric acid, which has been generated upon the aldehyd and alcohol.

$$\underset{\text{Aldehyd.}}{\begin{cases} C\,H_3 \\ C\,H\,O \end{cases}} + \underset{\text{Alcohol.}}{C_2H_5OH} + HCl = \underset{\text{Monochlorinated Ether.}}{\begin{matrix} CH_3 \\ CH \end{matrix} \begin{cases} OC_2H_5 \\ Cl \end{cases}} + H_2O$$

It decomposes the tetrachlorinated ether, according to the equation already given, into chloral, hydrochloric acid, and alcohol, which last may again react with a new quantity of aldehyd and hydrochloric acid. It is easy to conceive, therefore, that a limited quantity of water, alternately formed and decomposed, may take part in the formation of a considerable quantity of chloral

Wurtz and Vogt also show in their paper (Comptes Rend., lxxiv. 777) that by passing chlorine through a cooled mixture of aldehyd and aqueous hydrochloric acid, or even of aldehyd and water, chloral, contrary to the experiments of other chemists, is formed in notable proportion.

POISONOUS PROPERTIES OF JATROPHA URENS.

BY JOHN R. JACKSON, A.L.S., MUSEUM, KEW.

The following are the authentic details concerning a case of poisoning by this plant, which has formed the subject-matter of a paragraph that has recently been going the round of the papers:—

The occurrence took place in 1823, and the plant in question was raised from seeds sent from Trinidad. It is a small soft-wooded plant having lobed leaves which, together with the younger shoots, are covered with numerous stinging hairs. In the case mentioned above, the wrist accidentally came in contact with some of these hairs, and in a very few minutes the lips became swollen, the face became very red, and the whole system was affected. This was succeeded by faintness and a general suspension of the vital energies, so that for about five minutes the sufferer was thought to be dead, but after the lapse of this time he rallied, the first recollection of recovery being a feeling of relief from the head as if from the removal of a series of weights, each accompanied by a loud sound; sickness succeeded, and in twenty minutes he was again able to stand and was soon quite well.

After this sensational occurrence, the plant was put in a remote corner of the house and attended with great caution, but it soon died. About fifteen years ago another plant was raised at Kew from seed, and this was placed under a wire cage to prevent accidents to visitors. It would seem that Mr. Smith's experience of this plant, though sufficiently alarming, must have been mild by comparison, for we are told that in some persons unconsciousness last for a length of time; the pain and swelling also last for some days, and an itching sensation frequently continues for a much longer period.

The plant is a native of South America, and appears to extend into the Southern States of North America. Mr. Smith tells us that Mr. W. Purdie, who was botanical collector in New Granada for the Royal Gardens, Kew, from 1843 to 1846, spoke of the plant as being a constant terror to his guides during his collecting expedition. In Porcher's 'Resources of the Southern Fields and Forests' it is said that the plant "might be employed like the nettle (Urtica) as a counter-irritant in epilepsies and diseases requiring stimulating applications. The plants of this family furnish generally a stimulating and highly acrid oil, and they should be examined." A reference to the virulent nature of the plant is made at p. 252, Vol. II. of the present series of this Journal.

Another very virulent stinging plant which has been cultivated at Kew is the *Urtica gigas*, or tree-nettle of New South Wales. It grows to a height of 100 or 150 feet, with a tapering trunk which sometimes runs up to nearly 100 feet before branching. The tree is remarkable for the buttresses which are formed with great regularity around its base. It bears dark green cordate leaves, from twelve to fifteen inches wide, the stings upon which are most formidable and even dangerous. The tree was introduced to Kew by Allan Cunningham in 1828, and grew to a height of about six feet, but it died, perhaps from the neglect of the men under whose charge it was placed, and who probably had a natural dislike to it, owing to its excessively dangerous character, and from the fact of several of them having been stung by it. We believe the plant has never since been introduced. The curator was also a victim to this plant, having been stung in the hand; and he describes the effect as one of continued pain in the region of the arm-pit for six weeks or more, which pain became more sensible on the hand being wetted. Another species, *Urtica photinifolia*, likewise a tree abundant in the Clarence and Richmond brush forests is also very poisonous, as are some of the Indian species, such as *Urtica heterophylla*, etc.

A NEW SOURCE OF POTASH SUPPLY.

BY HERBERT HAZARD.

The present sources of the potash supply are rapidly failing; every year the area of the supply becomes smaller, and the product, in consequence of this and the increased demand, becomes more and more expensive. At the rate the country has been settled and the woods destroyed for the past ten or fifteen years, the source of supply in the United States will, in a comparatively few years, almost entirely fail. States which, a few years since furnished large quantities of ashes, now furnish none; wood has become too valuable in the arts to be burned even for fuel. The people as well as the Governments, in the older States, have commenced to discuss the ways and means of perpetuating their hard-wood forests, both as a protection to the land and for mechanical purposes. Soft woods do not yield enough of the salts to pay for working their ashes; hence we are driven to the newly-settled portions of the West and North-west for our present supply, the largest portion of which comes from Michigan and Wisconsin, where the trees are cut down and burned as the readiest means of clearing them from the land. But as the population of these States is rapidly increasing, and railroad lines are being proportionately extended, the forests are brought into more direct communication with the lakes and large cities, thus finding a market for their timber; and the saw-mill will then use up all the surplus trees, which will go into commerce as lumber instead of ashes, as at present. These causes will very much reduce, if not wholly terminate, the present supply from the North-western as they have from the Eastern States.

The forests of the Old World, by care and cultivation still furnish large quantities of potash, but never sufficient for home consumption, therefore this source of supply is not available to us; again, the demand for these salts is constantly increasing, both in medicine and in the arts, two more very cogent reasons why a never-failing source of supply should be secured.

This, it seems, can be accomplished in the following manner:—throughout the Western States large quantities of corn are produced, the cobs of which are now considered of little or no value, yet they may share the same fate as many substances which, though formerly considered worthless, have become new mines of wealth through the aid of chemistry. By the following assays and comparisons, I propose to demonstrate their value to pharmacy and the arts.

One hundred parts air-dried cobs yield, after drying at 212° F., the following results:—

	Cobs.	Ashes.	KCl.	K_2CO_3	Silica, Charcoal, Lime, Iron.	Loss.
1st,	91·70	1·120	·820	·750	·140	·230
2d,	90·95	1·040	·805	·745	·180	·115
3d,	92·85	1·015	·840	·755	·245	·005
4th,	90·94	1·115	·830	·795	·300	·020
Averaging,	91·61	1·072	·824	·762	·217	·093

Or, one hundred parts dried at 212° F., give the following results:—

	Ashes.	KCl.	K_2CO_3	Silica, Charcoal, Lime, Iron.	Loss.
1st,	1·221	·894	·818	·150	·253
2d,	1.143	·885	·819	·192	·132
3d,	1·093	·904	·834	·252	·007
4th,	1·226	·913	·874	·329	·030
An average of	1·171	·899	·836	·230	·105

The cobs were incinerated as thoroughly as possible without the use of nitric acid or other oxidizing agent, the presence of silica impeding the complete combustion of the charcoal. The ashes were assayed by exhausting them with water and filtering off the soluble portion, leaving a residue on the filter consisting of silica, charcoal, carbonate of lime, and a trace of iron. The filtrate was supersaturated with muriatic acid, evaporated to dryness and redissolved in acidulated water, leaving an additional quantity of silica, which was added to the first portion and weighed with it. The solution was then evaporated to dryness and weighed as chloride of potassium, and from this weight the carbonate was calculated.

In volume iv. of Watts's 'Dictionary of Chemistry,' the results of some analyses by Höss are given, from which it appears that ash, oak, elm and willow, which of our most common forest wood are richest in potash salts, yield respectively ·74, 1·50, 3·90 and 2·85 parts carbonate potash in one thousand of wood.

The average yield of one thousand parts of cobs, as shown by the tables above, is 7·62 parts carbonate potash, or nearly twice as much as the best specimens of wood, and from a material which can fill its full measure of usefulness for other purposes before it comes into the hands of the manufacturer of potash.

But the questions may be raised, how can these cobs be collected in quantities sufficiently large to pay for working them, and is the supply sufficiently large to be of any commercial importance? The first question is easily answered, for they are already collected at the shipping-points of the growing districts, where large shelling-mills, capable of running through 500 bushels of ears of corn an hour, are established; here, then, are the places where a supply of cobs may be procured. The figures below will show with what rapidity they accumulate.

A bushel of corn weighs 70 pounds on the cob; a bushel of shelled corn weighs 56 pounds, leaving a balance of 14 pounds cobs to the bushel; and a mill, shelling 500 bushels an hour, turns out 7000 pounds cobs an hour, or equal to 70,000 pounds per working day of ten hours. As many of these cobs as are necessary are used for the purpose of generating steam to run the shelling-mills; the surplus is sold, given away, or even cast out into places to decay. By collecting the ashes from these waste cobs, together with the ashes from the furnaces, it will be readily seen, by reference to the preceding analyses, what large quantities of potash salts may be produced from these now worthless cobs.

That the supply of cobs can never fail, the following statistics will show:—

The corn crop of the United States for 1870, was 1,094,000,000 bushels, of which amount

Illinois yielded	201,378,000	bushels.
Indiana ,,	113,150,000	,,
Missouri ,,	94,990,000	,,
Iowa ,,	93,415,000	,,
Making a total of	502,933,000	,,

in four States alone.

The corn crop of the whole country, for 1871, was 1,100,000,000 bushels, which, at 14 pounds cobs to the bushel, will yield 15,400,000,000 pounds, or 7,700,000 tons cobs, containing an average of three-quarter per cent. pure carbonate potassa. We have the enormous quantity of 115,500,000 pounds of that valuable alkali lost to commerce annually, which, if thrown into trade, would add very largely to the general resources of the country.—*Amer. Journ. Pharm.*

CRYSTALLIZED DIGITALINE.*

BY M. NATIVELLE.

The process adopted by the author for obtaining crystallized digitaline, a magnificent specimen of which accompanied the memoir, consists, in the first place, in exhausting the digitalis in 50† alcohol, instead of water, as ordered in the French Codex. He found that while the product obtained by an aqueous maceration contained chiefly an amorphous principle, soluble in all proportions in water, which he proposed to call digitaleine, the residue, usually rejected as useless and completely exhausted, contained nearly all the active crystallizable principle, together with another very bitter principle, approaching it in its properties, but not crystallizable. The alcoholic tincture so prepared was distilled, and the residue of the distillation concentrated to a weight equal to that of the digitalis originally used. Here the author introduces a modification based upon what is generally observed where several principles exist simultaneously in the same plant, that they exercise towards each other a particular influence, which determines or favours their reciprocal solution in the same liquid. This faculty, however, is manifested chiefly in a concentrated solution, being weakened or completely annulled when the solution is diluted. Thus, a concentrated solution of opium may contain, not only the principles dissolved directly by the water, but also more or less resin carried into solution by the influence of those principles, and which separates when the solution is diluted by a certain proportion of water. So with digitalis, in the concentrated solution that represents the product of evaporation after the alcohol is driven off, is found in solution, not only the principles directly soluble in water, like digitaleine, but other principles, such as digitaline and digitine, which, insoluble themselves, are kept in solution by the influence of the preceding in a concentrated solution. If, however, this solution be diluted by three times its weight of water, a gradually augmenting viscous deposit is formed, which represents nearly the whole of the digitaline, accompanied, it is true, by digitine and colouring matter, but freed from the digitaleine and other soluble principles—according to the author the chief obstacles to crystallization.

In order to extract from the viscous deposit the two crystallizable principles that it contains, it is to be dried in the open air, upon folds of filtering paper, and afterwards treated with twice its weight of boiling proof spirit. The filtered solution, left in a cool place, is quickly covered on the surface with crystals, which also form on the side of the vessel. This goes on for eight or nine days before the liquor is completely exhausted. The crystals are then separated; and after washing with weak alcohol are nearly completely colourless. The digitaline is then separated from the digitine by successive treatment of the crystals with chloroform, evaporating the chloroform, treating the deposit with eight times its weight of boiling 90 per cent. alcohol, adding a little washed animal charcoal, filtering and leaving to cool in a partially stoppered flask. The pure digitaline is then deposited in fine white and shining needles, grouped around the same axis. By this means, the two principles are effectually separated. The part dissolved is intensely bitter, giving a wonderfully intense emerald green colouration with hydrochloric acid, and having such a powerful physiological action that a quarter of a milligram is sufficient to produce the ordinary effects of digitalis. On the contrary, the part undissolved by the chloroform is tasteless, gives no colouration with hydrochloric acid, and exercises no appreciable action upon the organism.

In order to verify the results described in the memoir, the commission followed the process step by step, and succeeded in obtaining a product identical with the specimen accompanying the memoir. They also undertook a series of physiological experiments, the result of which led them to the conclusion that the new medicament appeared to produce effects identical with the other preparations of digitalis, particularly the digitaline of MM. Homolle and Quevenne, but incomparably more energetic, while, from the definite nature of the compound, more constant results follow its use.

* Extracted from the Report by M. Buignet, on behalf of the Commission, recommending the award of the Orfila prize (6000 francs) to the Author.

† The British Pharmacopœia orders rectified spirit.

THE NATURAL HISTORY AND COMMERCE OF SPONGES.

BY JOHN GIBSON.*

Every schoolboy knows that a tree and a dog belong respectively to the vegetable and animal kingdoms; but much older and wiser heads have been puzzled for centuries in trying to settle definitely to which of these two kingdoms sponges belong; and although the great majority of zoologists have now relegated them to the domains of animality, still there are many who hold that they are more at home among the plants, while a third party maintains that their true position is to be found in a *terra incognita*, lying somewhere between these two; that, in fact, the sponge is neither a plant nor an animal, but a living organism in which we find certain characteristics of both. It is curious to observe how opinion on this vexed question has vacillated from the remote past down to the present time. Aristotle, who was the first to make the sponge an object of scientific investigation, speaks of it as an animal. "The sponge," he says, "is a stationary or rooted animal." The same opinion was held by Pliny, who also tells us that in his time some writers divided sponges into male and female. That our earliest biologists should have placed sponges among animals seems somewhat remarkable. The outward marks—which, in those early days of scientific inquiry, were mainly relied on—such as their fixedness, their want of sensation, and their indefiniteness of shape, all seeming to point to their connection with the vegetable kingdom. Aristotle's views held undisputed sway

* Read at the Meeting of the North British Branch of the Pharmaceutical Society, April 18th, 1872.

through the dark ages, or to put it more correctly, the sponge in those times continued to discharge the practical duties of the *toilette*, and no unpractical questions regarding its nature seem ever to have been asked. With the revival of learning in the sixteenth century, however, the question was once more raised; the tide of scientific opinion set in strongly against Aristotle's view, and the sponges were now placed by general consent among plants, and even characterized as the most imperfect of their class. This remained the prevalent opinion down to modern times; thus we find Linnæus, in an early edition of his 'Systema Naturæ,' arranging the sponges among the cryptogamous algæ. About this time, however, Ellis and others succeeded in demonstrating the animal nature of zoophytes in general; again the views of the ancient writers were adopted, and in the twelfth edition of his great work, Linnæus arranges the sponges among animal zoophytes. This opinion has, since that time, been the prevalent one; while, since the publication in the Edinburgh 'Philosophical Journal,' of Dr. Grant's investigations on the structure and functions of the sponge, it may be said to have become almost universal. Regarding the sponge, then, as belonging to the Protozoa—the lowest of the animal sub-kingdoms—let us observe how it plays its humble part in the economy of nature.

The article known to commerce as the sponge, and which consists for the most part of a mass of delicate horny fibres interlaced with each other so as to form a rude sort of net-work, though it belongs to, yet does not constitute the animal. It is merely a framework on which the living part is supported, and corresponding somewhat to the skeleton of the higher animals. Those horny fibres are so arranged as to form regular canals, which permeate the sponge in every direction, and open on its surface in what zoologists term *pores* and *oscula*. The name of *pores* is given to the numberless small openings, while that of *oscula* is applied to those larger apertures which occur at rarer intervals on the surface of the sponge. It will afterwards be seen that the *pores* and *oscula* have very important, though entirely different functions to perform. In many of the sponges also, little needle-like bodies known as spicules are found scattered through the mass. These can be most readily obtained by burning a piece of sponge, when they are left behind, and from the variety of fantastic shapes which they assume, form beautiful microscopic objects. Their presence, however, in any sponge is fatal to its value as an article of commerce. In the living state every fibre of the horny framework is covered over with a coating of gelatinous matter of a brownish-yellow colour, and in other respects somewhat resembling the white of egg. This is the substance known as protoplasm, and which Professor Huxley regards as the physical basis of life. As living sponge is but an immense aggregation of minute bodies of this protoplasm, it may be well to notice some of the results of recent investigation on this substance, and specially as regards its modes of occurrence in nature. It is a true living fluid, for when allowed to escape from the cell in which it is confined, it moves about and gives all the signs of possessing life. It occurs in both the vegetable and animal kingdoms, existing in the former as the inner wall or primordial utricle, which is essentially the vital portion of every cell. In the latter it forms the most important constituent of the blood. Examine a drop of blood under the microscope, and it will be seen to consist of certain bodies known as red and colourless corpuscles respectively, floating in a colourless fluid. Separate a red corpuscle from its fellows, and it makes no motion; it passively assumes whatever shape you may impress upon it. Then place a single colourless corpuscle under the microscope, and, unlike the former, it will be seen to be ever changing its form, like a very Proteus. These colourless corpuscles consist of pure protoplasm. But this substance, which thus seems to carry on a subordinately independent life in the liquid element of our blood, is also found leading an entirely independent existence outside, not only in the aggregated form as in the sponge, but also as a separate solitary creature in the Amœba. This creature is found attached to vegetable growths in stagnant waters, and when looked at through the microscope behaves exactly as did the colourless corpuscle in the blood, or the protoplasm of the inner wall of the cell. It exhibits a constantly changing shape and has thus earned the name of Amœba, from a Greek word signifying change. This creature has been the subject of much and minute investigation, and yet no trace has been detected of what can properly be termed organized structure. It has no mouth, no gullet, no stomach and no intestine, and yet it gets hungry and eats; it grows, and therefore it must digest. How then is the work of nutrition which we always associate with the possession of the above organs performed in a creature apparently so structureless as the Amœba? Simply by its becoming for the time being, all mouth, then all stomach, and lastly all intestine. When the Amœba finds itself in the neighbourhood of something fit for food, it brings itself into contact with it, and then no matter at what part of its body this contact takes place, there it opens up,—an extemporized mouth is formed, and its victim, sometimes larger than itself, is gradually swallowed. Its food being thus engulfed, the creature now takes upon itself the duties of a stomach, and the foreign body is gradually dissolved, until the entire soluble portion is abstracted; the insoluble remnant has now to be dealt with, and the Amœba by virtue of a certain power of contraction which it is believed to possess, assumes the functions of an intestine, presses the effete matter from its interior towards its surface, when the animal again opens up and allows such matter to escape. But to return to our sponge; it has already been said that the gelatinous substance lining its canals is protoplasm. Any one may satisfy himself upon this point by getting a piece of living sponge from the Edinburgh and Glasgow canal, where the *Spongilla fluviatilis* abounds. Taking a thin section of this and placing it under the microscope, the canals will then be seen to be filled with a fleshy substance made up of a number of little bodies. Isolate one of these, and it will be found to exhibit phenomena in every way similar to what has just been described as belonging to the Amœba. Living sponge is thus an assemblage of amœba-like protoplasms supported on a network of delicate fibres. Unlike those creatures, however, the protoplasms of the sponge are fixed, the entire colony remaining permanently rooted; and being thus unable to go in search of food, they are solely dependent for their subsistence on the nutritious particles that may happen to come within their reach; and this bring us to consider the functions of the pores and oscula on the surface of the sponge. Dr. Grant, after long-continued observations, discovered that there was a constant flow of water into the smaller openings or pores, and that there was as regular an outflow of water from the larger apertures or oscula. He also found that the water from the oscula, had in its course through the sponge, been deprived of its oxygen and of its nutritious ingredients; while, on the other hand, it had become charged with the effete materials of digestion. It was thus shown that, by some means or other, water laden with nutritive matter was made to enter by the pores, and that passing along the canals, it surrendered its valuable contents to the little protoplasms arranged along the sides; that sweeping on, it gathered up the effete matter constantly being given off, and then entering the wider passages, its course got turned, and now moving towards the surface was at last ejected from the oscula. The means by which these opposite currents are produced has been the subject of much controversy, but Dr. Grant has shown that in many cases at least they are produced by the action of vibratile cilia. These cilia are minute hair-like bodies found on certain parts of all animals, but occurring in greatest abundance among the lower forms of animal life. They are constantly in motion while the creature lives, and even continue to move for some time after life has become extinct. The cause of this motion is attributed to waves in the protoplasm to which the cilia are attached. Dr. Grant believes that such cilia exist in all sponges, though from their minuteness in certain species, we have not yet been able to discover their presence.

A living sponge may thus be fitly described as a large and populous city, all honey-combed over with innumerable streets and lanes, and whose protoplasmic inhabitants ever sit, like Eastern shopkeepers, out doors, and make their living by picking up whatever treasure fortune may put in their way. Nor are they totally unprovided with instruments for seizing their prey. In common with the Amœba, they have the power of sending out prolongations of their own substance, known as *pseudopodia*, or false feet; and casting these across the watery channel, they lie in wait for the unfortunate animalcule that has just been allured by the ever-waving cilia to enter in at the outside pore, heedless of the shattered remains of fellow animalcules that are being constantly ejected from the neighbouring osculum. With regard to their mode of propagation, the parent sponge throws off little masses of protoplasm, which are taken up by the current passing along the canals, and sent out into the world of waters through the oscula. They float about in the water by means of cilia, specially developed for this stage of their existence, and for some time show considerable activity. Their appetite at this season also appears to be enormous. On this point, Mr. Carter, of Bombay, furnishes us with some interesting particulars. In one case "he saw one of these proteans approach a gelatinous body, something like a sluggish or dead one of its kind, and equal to itself in size, and having lengthened itself out so as to encircle it, send processes over and under it from both sides, which uniting with each other, at last ended in a complete approximation of the opposite folds of the cell wall throughout their whole extent, and in the enclosure of the object within the duplicature. Even while the protean was thus spreading out its substance into a mere film to surround so large an object, a tubular prolongation was sent out by it in another direction to seize and enclose in the same way a large germ which was lying near it. After having secured both objects, the protean pursued its course rather more slowly than before, but still shooting out its dentiform processes with much activity. It took about three-quarters of an hour to perform these two acts." Mr. Dallas, in his work on Natural History, also states: "That not unfrequently combats take place between two of these singular creatures, when, if the size of the combatants be nearly equal, they merely twist about for a short time and then separate, but if there be any great disparity in bulk, the larger one swallows up his antagonist without remorse." After leading this roaming life for a while, they gradually lose their cilia, settle down and get attached to some object at the bottom, where they begin to build up their skeletons, and assume the form of sponges.

(*To be continued.*)

OLIBANUM.

At a recent meeting of the Botanical Society of Edinburgh, Professor Balfour read the following extract from a letter received by Mr. Anderson-Henry from Colonel Playfair, dated Algiers, December 20th, 1870:—"When I was at Aden, Sir William Hooker wrote to me to say, that the tree which produced the *Luban maitee*, or olibanum of the east coast of Africa, was quite unknown to science, and he asked me to try and solve the enigma. It was believed to be a *Boswellia*, certainly not *B. thurifera* of Mutis, and that was all that was known of it. The north-east corner of Africa, around Cape Guardafui, where it was obtained, had rarely been visited by Europeans, never by naturalists; and it was some time ere I was able to get there. However, a report reached us that two men-of-war's crews had been murdered on that coast, and I was sent to investigate the affair in a man-of-war. During my stay on that coast, I directed my particular attention to the gum and resin-producing plants for which it is celebrated (it is the *Thurifera regio* of the ancients). I collected six species, which I sent home in a dried state to Kew, and Sir William Hooker pronounced them all new to botany. Amongst these was the *Luban maitee*, or true olibanum, the most wonderful plant it was ever my fortune to fall in with. It grows *on* not *out* of the polished limestone rock by a sort of intumescence at the base, like a boy's sucker; not a fibre seems to penetrate the soil. The district is almost rainless, yet the tree exudes its fragrant gum in immense quantities. It was not the season to obtain seed, so I did what I could by bringing away live plants, some of which I sent to Dr. Birdwood at the Victoria Gardens, Bombay, and some I planted on the hills at Aden in as nearly their natural condition as I could. Of these, a number succeeded; and they have at length flowered and seeded. A very small quantity of the seed reached me from Aden a day or two ago; and this I share equally between Hooker, you, and myself. The problem will be to get it to grow. It will require, of course, great heat; but in its native climate it gets very little moisture. I also send you a small specimen of the gum produced by the tree, which I actually gathered myself on the spot, and have kept by me ever since. It bears a great resemblance to the gum dammar of commerce."

COTTON SEEDS.

BY HORATIO N. FRASER.

From the time when cotton was first cultivated in the United States until within a few years, the lint or fibre was the only part used either in medicine or the arts; the seed, or all that part not used for re-planting, was considered as having no value, and was looked on only as an incumbrance. Since these seeds weighed nearly twice as much as the part formerly used, it became the subject of thinking men's experiments—how they could be turned to some use; and the results of these experiments have lead to the discovery and subsequent usage of the various products obtained therefrom.

A chemical analysis of the seeds demonstrated that a large percentage of a fixed oil could be produced from them, and not only that, but that the kernel might be advantageously used for food for animals. This latter was tried some years ago, but led to bad results; for even the best gins which were invented could not separate the lint entirely from the seeds to which it adhered, consequently this insoluble matter, with the hulls, formed hard masses in the stomach, and produced even fatal effects from the irritation of the membranes of the intestines. But, to obviate this, hullers have been made which decorticate, or remove the hull, with the adhering lint, entirely from the kernel. This is almost an invaluable invention for the planter; for, when we consider the millions of pounds of cotton which are annually produced in the Southern States, and also that the weight of seed is double the weight of the other portion, then we may be able to estimate the value of these seeds, when turned into nutritious food for stock.

Since small hullers have been introduced on many of the plantations, the planters are enabled to hull their own seeds. These are thrown into the top of the hullers, and first come in contact with knives, which cut the hull; then they are passed through sieves, by which process the kernel and hulls are separated. The kernel is divided into two portions; the first is that part which has been broken or cut by the knives; this is ground to make the meal used for feeding, and constitutes one-third of the whole weight of kernel. The remaining two-thirds come out whole, and are sold for other purposes. This meal has been found to be as rich in flesh and fat producers as linseed meal for stock, and supersedes the use of it in the cotton-growing States. The hulls are piled in heaps until they arrive at the right state of decomposition to be used as a fertilizer, for which they are well adapted, being rich in the phosphates and lime characteristic of substances used for this purpose. The seeds contain a fixed oil to the amount of about thirty-seven per cent. of the weight of the kernel, most of which is obtained by expression.

At the factory on Long Island, which the writer visited, the seeds are bought with the hulls on, although the whole kernel is generally bought directly from the planter. These are first thrown into a gin, which separates some more of the lint. This is packed in bundles and sold for ordinary cotton batting. From this they are conveyed to the hullers and undergo the decorticating process. The kernel is then carried by an elevator to a box, which feeds two large iron rollers, converting it into meal; the meal is put into a large vessel heated by steam, to render the oil more fluid, and then is put between iron plates, which are forced together by hydraulic pressure, which presses out nearly all the oil and some mucilage. About eight per cent. of oil is left, which cannot be removed except by solvents. This oil, as then obtained, is of a handsome dark wine colour and sweet taste. This then undergoes the purifying and bleaching process, which is kept a secret by the manufacturers.

The purified oil is either a golden yellow or white colour. An oil is also produced by chilling the purified oil, and expressing, to obtain a variety almost free from stearine, called by the manufacturers "winter oil," from the fact that cold will not thicken it.

This oil is used extensively in the arts, chiefly to adulterate and substitute higher-priced oils. Cheap paints are ground in it, and it is used to a certain extent to adulterate linseed oil; but being a non-drying oil, only a small percentage could be used.

It is also used for adulterating sperm oil for burning, and for mixing with lard oil. The most practical way to detect these is to heat the suspected oil with distilled water; separate the water and add a solution of subacetate of lead. If it contained cotton-seed oil, a white precipitate will be formed, on account of the presence of mucilage, which is always found in this oil. If the sperm or lard oil is pure, it would be indicated by the absence of any milkiness.

It is also used to adulterate olive oil, and chemistry has found no practical mode by which they can be definitely distinguished apart.

A soap has been made of the residue left after refining. It is of a more or less dark brown colour, and disagreeable smell. It is used in the laundry, and sells from three to seven cents a pound, according to quality. It was also attempted to make a soap from the white oil. This, when first manufactured, is of a handsome white colour, but after standing some length of time it becomes dark, and finally almost black. It is not made now.

It is used to the amount of ten per cent. in making fancy soaps, to give them a good lather, for which the oil is said to be the best known; but even in this small amount the odour of the rancid oil can be detected.

The hulls are used for fuel in the factory, and the greater part of the cake-meal was sent to Europe, the farmers of this country, at that time, not being generally acquainted with its properties. It sold for about thirty dollars a ton.

A few years ago, the oil was noticed in the journals in connection with preparations of pharmacy, to be substituted for oils in liniments and ointments, for which it is adapted by its properties as an emollient, but nothing definite was arrived at. Being cheaper than even the commonest grades of olive oil, and resembling it so much in its behaviour, it is peculiarly fitted for the preparations of the pharmacopœia in which the olive oil is used. Mixed with aqua ammoniæ in the officinal quantities for "Liniment. Ammoniæ," it makes a product which has all the essential properties that are indicated by the olive oil, and has the advantage of not forming so thick a mixture, thereby making it more convenient. In the "Lin. Camphoræ," it seems to serve exactly the same purpose as the officinal oil.

Lead plaster made with the cotton-seed oil has been substituted with advantage for the officinal, and has been used to mix with it to the amount of fifty per cent. by some manufacturers of the plaster. This, made with the cotton-seed oil alone, forms a handsome, light coloured plaster, apparently equal in all respects to the English, with the exception that it does not become hard enough to keep its shape, in the usual form of selling it. But when mixed with olive oil in equal proportions, this difficulty is entirely overcome.

The cost of the plaster made with the cotton-seed oil, using the best English litharge, is twenty cents per pound. This difference in the cost, combined with the practicability of using it, will recommend it to the more careful examination of druggists who deal extensively in this preparation.—*Amer. Journ. Pharm.*

MEETING AT LEEDS.

A Meeting of Members of the Pharmaceutical Society resident in Leeds, was held in the Library of the Chemists' Association, on Monday, 22nd inst.; Mr. Edward Brown, President of the Leeds Chemists' Association, in the chair.

The Chairman said that it had been their custom for the past few years to meet for the purpose of consultation, upon the important question of selecting representatives at the annual election of members of Council. He believed that the desirability of this mutual consultation was never greater than at the present time. A glance at the past disclosed the fact that no less than three Defence Associations had been formed amongst chemists and druggists to oppose aggressive legislation threatened towards our body. It was now made pretty plain that Government did not entertain the inflexible determination to enforce such legislation, as it had been loudly asserted was the case.

But the real danger lay in the conduct of some who ought to be their friends, and the combination to which he had alluded was rendered necessary in order to deliver them from such friends. Whilst the meeting would doubtless receive with due respect the results of any deliberations on the same question from their brethren elsewhere, he was fully aware that it would do so in an independent spirit, and consider the whole question upon its merits. The desirability of united action amongst those holding similar opinions was very clear, and he would ask the meeting to consider whether the candidates put forward by the Defence Associations would compare favourably, on general grounds, with the other candidates. Personally, he believed they would do this.

The following Resolutions were unanimously adopted:—

1. That this meeting of Members of the Pharmaceutical Society, having considered the List of Candidates for the new Council, resolves that the list of 14 names proposed by the United Defence Associations is deserving of its cordial support, and hereby promises the same.

Moved by Mr. E. Thompson,
Seconded by Mr. W. Smeeton.

2. That the Chairman and Local Secretary be authorized to sign, on behalf of this meeting, a recommendation of the said List.

Moved by Mr. J. Day,
Seconded by Mr. E. Yewdall.

The thanks of the meeting were voted to the Chairman.

The Pharmaceutical Journal.

SATURDAY, APRIL 27, 1872.

Communications for this Journal, and books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

PHARMACY IN THE SHOP AND APPRENTICES.

Two subjects have now for some time been discussed side by side, in the columns of this Journal, both of them extremely important in their bearings on the future welfare of the pharmaceutical body, and also having a more intimate relation to each other than has yet, perhaps, been claimed. The recent discussion on the apprenticeship question, having had its origin in the large proportion of candidates failing to pass the Preliminary Examination, turned rather upon the necessity of exacting an educational test from apprentices, previous to their being bound, than upon the best method of imparting to them a sound technical education after they have entered the business. As regards the former point, it is gratifying to find a very general recognition of the principle that no one who has the welfare of pharmacy at heart should receive an apprentice, on any terms, until he has satisfied the present very moderate requirements of the Preliminary Examinations.

But it must be evident that the exclusion of unqualified candidates from among the apprentices is even of less importance than the adoption of adequate means of educating those who are accepted. It is, therefore, to be regretted that the subject broached by the President of the Pharmaceutical Society, with the special object of pointing out how a more general preparation of galenicals by pharmacists would conduce to the education of their apprentices, has been argued more particularly from the point of view whether it would pay, and as to the amount of immediate benefit that would result to the master.

These are matters that will perhaps be decided upon variously, according to special circumstances, and they may well be left to individual judgment; but in the interests of those entering upon the business of Pharmacy, the home preparation of galenicals and chemicals is at the present time especially deserving of further consideration from a different point of view by those who still take apprentices.

It is true the changes that have occurred in our social relations during late years, especially in large towns, have done away with much of the domesticity that formerly brought the master, as a teacher, more intimately in contact with his apprentice. Moreover the enhanced facilities of communication, together with the increased use of machinery, have enabled manufacturers to offer inducements to the pharmacist to buy many of his preparations ready made, and these, with a variety of other circumstances, have tended much to develope an inclination to shift the burden of educational responsibility almost entirely upon schools of pharmacy and the apprentice's own efforts. A recent correspondent speaks of the majority of provincial pharmacies, as being places where the "master's "time is fully occupied with the multitudinous affairs "of the shop;" and, while freely acknowledging that it is the master's duty to see that the pupil receives a fair share of practical tuition, he is of opinion that "this may be accomplished by a supply of experi-"mental apparatus, and an allowance of extra time "each week for the student's use."

We fear that even this is far in advance of what, in very many cases, is acknowledged as the duty of employers towards their apprentices, or is at any rate practised in all cases. But even if the apprentice were always able to study for a term at a school of pharmacy, or if professors were—

> "Glad to turn itinerant
> To stroll and teach from town to town,"

such a system would still leave a deficiency that could be supplied by no person so well as by the apprentice's employer. Attendance at systematic courses of lectures and the study of scientific principles should certainly be regarded as necessities for the pharmacist of the future; but we believe the shop must ever be the chief school of practical pharmacy; if it be connected with a laboratory, so much the better. No amount of book or lecture knowledge, although supplemented by experiment, will supply that experience which is to be gained in the habitual preparation of the pharmacopœial compounds; and it is evident from the testimony of several of our correspondents that such preparations can frequently be made at home with advantage, both in price and quality.

But were it otherwise, and did it entail a cost upon the employer, the necessity appears equally plain for all who incur the responsibility of taking apprentices. It now is the clear duty of every pharmacist to do all he can to raise the status of his calling, and in no way can the individual be so influential in that direction as by turning out a well trained and thoroughly taught pupil. Of course, for a long time there will exist those who, untaught themselves, are unable to teach, and by whom apprentices will be taken to supply the places of mere shopmen and porters. But each year the proportion of qualified men will increase, and it will behove them to keep up the standard of education, not only by exacting from their apprentices the preliminary test, but also by securing a payment in the way of premium that shall be an equivalent for the time, labour, and money requisite for giving their apprentices such technical instruction as will fit them to take honourable and useful positions in the calling they have chosen.

EARLY CLOSING IN THE METROPOLIS.

It is satisfactory to be able to report that this movement, to which we referred three weeks since, is steadily progressing. Many laudable attempts in the same direction have previously been made, but from a want of co-operation between the employers and the assistants, with whom they have generally originated, but little success has hitherto been attained. On this occasion, however, the employers have taken the lead, and the results are, so far, very gratifying. Already nearly all the chemists in Oxford Street, Bond Street, Piccadilly and Conduit Street have commenced to "educate" the public into the habit of sending for their medicines in proper time, and with that object they have agreed to put up their window-shutters at 8 P.M. and their door-shutters at 9 P.M.

We direct attention once more to this movement, the more readily, since, there being no organization, —no treasurer, to collect subscriptions, and no secretary,—the spontaneous adherence of the London pharmaceutists is required, each being left to adopt such hours as may suit him best. We think we are justified in saying that, on the part of the assistants, there will be an effort made to prevent the interests of the employers suffering from the change.

THE ANNUAL MEETING AND THE ELECTIONS.

The extract from the Bye-laws of the Pharmaceutical Society that has appeared for several weeks among the official notices on the first page of the Journal cover, will have conveyed to most of the members a sufficient intimation that all who do not *before* the 1st of May pay the subscription due on the 1st of January last, will, by such default, become incapacitated from taking any part in the ensuing elections of members of Council and local secretaries, or attending the Annual Meeting; indeed, they will thereby cease to be members of the Society. We are induced specially to call attention to this fact, since the meeting of the Council falls this year on the 1st of May, and consequently there will be no opportunity of restoring a lapsed membership before the issue of the voting-papers, which can only be sent to persons whose names are on the Society's books.

We also take the opportunity of alluding to the election of local secretaries, on account of the want of interest and misunderstanding evidently existing in some localities. On several occasions it has devolved upon the Council to appoint local secretaries in the absence of any nomination, while only recently a letter has been received from an old member asking how local secretaries were nominated, and wondering why he himself had never had a turn of office. To any other persons troubled with the same doubts, we would say that in the course of next week a nomination paper will be sent from the office to each Member and Associate in business; and by following the plain directions therein laid down, the recipient may nominate any member of the Society he may please who lives in the district. Considering the important services these gentlemen are frequently called upon to render to the Society, it is to be hoped that each member will do his part in keeping the organization in a state of efficiency.

The next Evening Meeting of the Pharmaceutical Society will be held on Wednesday next, May 1st, when Mr. Greenish will read a paper on "Pharmacy in Austria." The chair will be taken at half-past eight precisely.

A provision has been introduced into the New York Pharmacy Bill, which is still before the legislature, that "junior assistants" or "apprentices in pharmacy" shall not be permitted to prepare physicians' prescriptions until they have become "graduates" or "licentiates" in pharmacy. This would seem to necessitate a very prompt acquirement of the qualification upon ceasing to be an apprentice, and arriving at the dignity of "graduate." Another point that seems to be objectionable is the constitution of the examining board, which, as the Bill stood at the time of our latest advices, was to consist of three graduates of a legally constituted medical college and two graduates of a college of Pharmacy. Assuming that pharmaceutists know their own business best, it is not very clear why there should be a preponderance of medical men amongst their examiners.

Some attention has recently been drawn to the extremely poisonous nature of the sting of *Jatropha urens* by the circulation of a paragraph describing its effects upon the system, experienced by the ex-curator of the Royal Gardens, Kew, who got accidentally stung by it soon after the plant was introduced, about fifty years back. The paragraph in question is essentially correct, but the facts, as given at p. 863, have been obtained from Mr. Smith's own lips.

Transactions of the Pharmaceutical Society.

EXAMINATIONS IN LONDON.

April 17th and 19th, 1872.

Present—Messrs. Allchin, Barnes, Carteighe, Cracknell, Davenport, Edwards, Gale, Garle, Haselden, Ince and Southall.

Dr. Greenhow was also present on behalf of the Privy Council.

MAJOR.

Seven candidates presented themselves; of these, *two* failed. The following *five* passed, and were declared duly qualified to be registered as "Pharmaceutical Chemists."

*Hill, William Edward	Leicester.
Wilson, John Herbert	Lee.
Wright, Thomas	Leicester.
Dale, John	Birmingham.
White, William Edwin	Dover.

These names are arranged in order of merit.

MINOR.

Thirty-nine candidates presented themselves; of these, *seventeen* failed. The following *twenty-two* passed, and were declared duly qualified to be registered as "Chemists and Druggists."

	*Cole, Edward Henry	Leeds.
	*Cortis, Arthur Brownhill	Worthing.
	*Appleby, Edward Joseph	Brighton.
	*Evison, William	Louth.
	*Howse, Henry William	London.
	Houghton, Robert William	Bermuda.
	Smart, Charles Frederic	Littlehampton.
	Harrington, Arthur Lewis	Rochford.
	Dixon, John Seth	Tunstall.
	Williams, William Griffith	Abergele.
	Robeson, Charles Brunting	Walworth.
	Bates, William	Stevenage.
	Haworth, Benjamin Henry	Manchester.
	Vince, James	Lancaster.
	Maitland, Alick	London.
	Saunders, Thomas Bealby	Cheltenham.
	Bishop, Charles Edward	Bristol.
	Cottam, William Procter	Lancaster.
Equal.	Blackwell, Frederick William	Birmingham.
	Jones, Mathew Henry	London.
	Maurice, James	Cardigan.
	John, Jabez Arundel	Tenby.

These names are arranged in order of merit.

PRELIMINARY.

The undermentioned Certificates were received in lieu of this examination.

Certificates of the College of Preceptors.

Charlton, John Spark .... Newcastle-on-Tyne.
Wilson, Robert .... Boston.

Certificate of the Society of Apothecaries.

Arrowsmith, George P. ...... London.

Certificate of the University of Cambridge.

Shaw, William .... Shrewsbury.

Certificate of the University of Oxford.

Gutheridge, George Frederick . Falmouth.

The following is the result of the Examination held on the 8th instant:—

ENGLAND AND WALES.

Two hundred and ninety-nine candidates presented themselves for this Examination; of these *one hundred and forty-one* failed. The following *one hundred and fifty-eight* passed, and were duly registered as

APPRENTICES OR STUDENTS.

	Taylor, Edward	Birmingham.
	Jones, William	Beaumaris.
	Shakespeare, Alfred	Leicester.
Equal.	Glyde, Henry Alfred	Bedford.
	Hall, Edward	Norwich.
	M'Knight, John	Hackney.
	Bowness, William	Workington.
	Scoley, Thomas Edward	Boston.
	Brend, Kenneth Benjamin	Swansea.
Equal.	Sanders, Gabriel	Birkenhead.
	Wallas, Thomas Irving	Carlisle.
Equal.	Gilders, George Pollard	St. Leonard's.
	Greenwood, Dennis	Cambridge.
	Jones, James Lewis	Bangor.
	Walton, Daniel	Manchester.
	Richards, Jonah	Cardigan.
	Cardwell, Ernest	Lytham.
	Rigg, John	Preston.
Equal.	Guy, Daniel	Lee Green.
	Hanham, John	Pendleton.
	Howard, George William	Tunbridge Wells.
	Waddington, Charles Edwin	Bath.
	Clayton, William	Howden.
Equal.	Robinson, William Prior	Waterloo.
	Savory, John Field	London.
	Upsall, Edgar Arthur	Holbeach.
	Brown, George German	Dresden.
Equal.	Bates, Edward	Bicester.
	Newitt, Herbert Henry	Bicester.
	Martin, John Wesley	Stratford.
	Parkinson, Frederic William	Peterborough.
	Bibbings, John Henry	Exeter.
Equal.	Elkington, William Alfred	Spalding.
	Haworth, Hezekiah	Blackburn.
	Roberts, Richard Pritchard	Bangor.
	Weedon, Joseph	Crawley.
Equal.	Bradbury, Thomas	Ashton-under-Lyne.
	King, John William	Bolton.
Equal.	Owen, Herbert	Coventry.
	Tracy, James	Kingston-on-Thames.
	Walker, William	Settle.
	Morris, John James	Cardigan.
Equal.	Linney, William Wycliffe	Ashton-under-Lyne.
	Lomax, Alban Edward	Liverpool.
	Stibbs, James	London.
Equal.	Amson, John Henry Occleshaw	Brindley Ford.
	Catford, Obadiah William	Chard.
	Evans, John	London.
	Leigh, Marshall	Middlesbrough.
	Robertson, Robert	Coventry.
	Strickland, Robert Brewster	Manchester.
	Walton, Henry	Manchester.
	Warburton, Walter	Middlesbrough.
	Wingrave, Vitruvius H. W.	Coventry.
	Troughton, Henry	Lancaster.
Equal.	Buswell, Frank	Leicester.
	Cousens, John Stather	Hull.
	Hicks, William King	London.
	Inger, George Edward	Nottingham.
	Salmon, Harold	Oxford.
	Smith, Thomas	South Shields.
	Williams, Walter	Oxford.
	Bridge, William Joseph	Wigan.
	Fresson, Charles Francis	Stevenage.
Equal.	Cobb, Frank	Sheffield.
	Dixon, William	Stratford-on-Avon.
	Watson, Thomas	Wells.
Equal.	Cory, Francis Albert	Newport, I. of W.
	Fawthrop, Thomas	Ryde, I. of W.
	Herbert, William James	Wantage.

*Passed with honours.

Equal.
Briggs, William Henry ...... Wakefield.
Hall, Richard Arthur .... Leigh.
Holliday, John .... Birmingham.
Newlyn, James .... Plymouth.
Peché, John .... Chertsey.
Southern, Charles William.... Donington.

Holt, George Alfred.......... Douglas, I. of M.

Equal.
Machin, William George...... Donington.
Piper, John .... Penzance.
Plumer, John George .... London.
Reeve, George Dunn Reeve .. Portsmouth.

Burden, John Britten .... London.

Equal.
Boultbee, Charles Edward .... Norwich.
Bramley, William............ Uppingham.
Brawn, James Ward .... Birmingham.
Brewerton, Thomas .... Manchester.
Cronkshaw, John .... Manchester.
Dawson, William Hewson .... Horncastle.
Gidney, Stephen William .... Windsor.
Harvey, William .... Walsham-le-Willows.
Jenkins, Alfred George ...... Birmingham.
Law, James .... Blackburn.
Tritton, Charles .... Bristol.
Ware, Emanuel.............. Broad Clyst.

Equal.
Lowe, Arthur................ Lynn.
Smith, William.............. Batley.
Sutton, George Sewell........ Gosport.

Gilbert, Sydney.............. Exeter.

Equal.
Chapman, Walter............ Nottingham.
Eady, Albert Arthur .... Chertsey.
Hartley, Thomas .... Preston.
Hughes, John Williams ...... Manchester.
Lord, John Edward .... Rawtenstall.
Mumford, Richard .... London.
Silverwood, Joseph .... Manchester.
Taylor, Jonathan............ Saltburn-by-the-Sea.
Taylor, William Edward...... Basingstoke.

Howells, William............ Llandovery.

Equal.
Bartle, William Thomas...... Heckmondwike.
Bridges, Ernest Claude ...... Kingsdown.
Mackenzie, Charles Anderson.. Plymouth.
Wilson, William Norman .... Liverpool.

Equal.
Bladon, William George ...... Cheltenham.
Broad, Thomas Benjamin .... Macclesfield.
Davies, John .... London.
Griffiths, David James ...... Cardigan.
Millhouse, Harry How ...... Sleaford.
Pattrick, George .... Long Sutton.
Rowe, Walter .... Leicester.
Spensley, Thomas Brentnall .. Middlesbrough.
Welborn, Otto Francis ...... Eton.

Equal.
Jones, Thomas .... Aberystwith.
Kellett, Richard Edward .... Wigan.

Gooseman, John Brocklesby .. Grimsby.

Equal.
Agger, Joseph Edward ...... King's Lynn.
Catcheside, Matthew Henry .. Hexham.
Harriman, Edwin............ Liverpool.
Northcroft, Arthur .... Plymouth.

Equal.
Barlow, Frederick .... Birmingham.
Fowler, George William.. Hackford next Reepham.
Hill, John Staniforth .... Blackpool.
Rickinson, Francis William .. West Hartlepool.
Sanderson, Edward John...... Stockport.
Sheldon, Arthur E. .... Walsall.

Dimmock, Frederick Augustus London.

Equal.
Hardy, James Hammond .... Filey.
Horril, William Harris ...... Newton Abbott.
Rees, Evan.................. Carmarthen.
Sturdy, Thomas Metcalfe .... Leeds.
Toon, Lionel Edward .... Gosport.
Turner, John................ Bath.

Equal.
Alfieri, Charles .... Stafford.
Frater, Mark................ Rothbury.
Halhead, John Armitstead .... Kirby Lonsdale.
Price, Herbert Ernest .... Ledbury.
Thompson, John Hartley...... Sheffield.

Equal.
Cox, Joseph Bethell.......... Lynn.
Crossley, Newbold .... Bury.
Dee, Walter .... Cheltenham.
Hardy, Frederic Warren...... Wigan.
Harrington, Arthur.......... Needham Market.
Howard, Augustus Frederick.. London.
Kerr, George Jobbing .... Liverpool.
Manock, Edmund............ Preston.
Maxfield, William Ashley .... Darlington.
Owen, Griffith Charles Roose.. Carnarvon.
Sproson, Thomas Frederick .. Wolverhampton.
Walker, Francis .... Liverpool.

The above names are arranged in order of merit.

SCOTLAND.

Forty-eight candidates presented themselves for this Examination; of these *twenty-one* failed. The following *twenty-seven* passed, and were duly registered as above:—

Christie, James .... Oldmeldrum.

Equal.
Hindes, James .... Edinburgh.
Scott, Peter .... Greenock.

Stiell, Gavin, jun. .... Dunfermline.
Forgie, William .... Falkirk.

Equal.
Forrest, John Kerr .... Edinburgh.
Hay, Joseph Pagan .... Dumfries.
Johnstone, Thomas Francis.... Dumfries.
Keith, John .... Glasgow.

Fogg, James .... Dunfermline.

Equal.
Nicholson, John H. .... Moffat.
Smith, Walter J. .... Edinburgh.

Robertson, Charles .... Edinburgh.
Dunlop, Thomas .... Govan.
Hunter, John Carswell ...... Glasgow.

Equal.
Frazer, Samuel M'Call ...... Glasgow.
Meikle, George .... Dunfermline.

Bean, John.................. Edinburgh.

Equal.
Hewetson, William .... Dumfries.
Lee, Alexander Milne .... Strichen.

Webster, James.............. Banff.
Reid, James .... Edinburgh.
Ellis, George .... Banff.
Smith, Patrick Cheyne ...... Oldmeldrum.
Wallace, Robert .... Cupar (Fife).
Murison, John .... Fyvie.
Duffus, George .... Aberdeen.

The above names are arranged in order of merit.

The following is a list of the Towns at which the Examinations were held, with the numbers of Candidates annexed:—

ENGLAND AND WALES.

	Candidates.	Passed.	Failed.		Candidates.	Passed.	Failed.
Abingdon	1	1		Canterbury	1		1
Altrincham	1		1	Cardiff	2		2
Ashton-under-Lyne	2	2		Cardigan	3	3	
Bangor	5	4	1	Carlisle	2	1	1
Barnstaple	1		1	Carmarthen	4	2	2
Basingstoke	1	1		Cheltenham	4	2	2
Bath	2	2		Chesterfield	1		1
Bedford	1	1		Cockermouth	2	1	1
Bideford	1		1	Coventry	4	3	1
Birkenhead	1	1		Darlington	1		1
Birmingham	8	5	3	Denbigh	1		1
Blackburn	4	2	2	Derby	1		1
Blackpool	2	1	1	Dewsbury	2	2	
Bolton	3	1	2	Doncaster	3		3
Boston	4	4		Douglas	1	1	
Bradford	2		2	Dublin	1		1
Bridlington	1	1		Exeter	3	3	
Brighton	1		1	Flint	1		1
Bristol	6	3	3	Gainsborough	1		1
Cambridge	1	1		Goole	1	1	
				Grimsby	2	1	1

	Candidates.	Passed.	Failed.
Guernsey	1		1
Guildford	1		1
Harrogate	2		2
Hereford	1	1	1
Hitchin	1		1
Horncastle	1		1
Huddersfield	1		1
Hull	2	1	1
Ipswich	1	1	
Kendal	1	1	1
Kidderminster	1		1
King's Lynn	6	3	3
Knutsford	2		2
Lancaster	2	2	
Leeds	2	1	1
Leicester	6	4	2
Lewes	1		1
Liverpool	9	6	3
Llandovery	1		1
London	29	17	12
Macclesfield	2		2
Manchester	24	11	13
Margate	1		1
Merthyr Tydvil	1		1
Middlesbrough	5	4	1
Newark	1		1
Newcastle-on Tyne	3	2	1
Newcastle-under-Lyne	2		2
Newport	1	1	
Northampton	1		1
Newtown	1		1
Norwich	5	3	2
Nottingham	2	2	
Oldham	1		1
Oxford	5	4	1
Peterborough	1		1
Plymouth	4	3	1
Portsmouth	3	3	
Preston	7	4	3
Richmond (Yorks.)	1		1
Rochester	2		2
Ruthin	1		1
Ryde	1	1	
Salisbury	1		1
Scarborough	1		1
Sheffield	5	2	3
Shrewsbury	1		1
Sleaford	6	1	5
South Shields	2	1	1
Spalding	4	2	2
Stafford	3	1	2
Stamford	2	1	1
St. Ives	1		1
Stockport	3	1	2
Stockton-on-Tees	1		1
Stoke-on-Trent	4	1	3
Stowmarket	1	1	
Sunderland	1		1
Swansea	4	1	3
Taunton	1	1	
Tenterden	1		1
Torquay	1	1	
Truro	2	1	1
Tunbridge	1		1
Tunbridge Wells	1	1	
Wakefield	1	1	
Walsall	1	1	
Warrington	1		1
Warwick	1	1	
Welshpool	1		1
West Hartlepool	1	1	
Wigan	4	3	1
Windsor	3	3	
Wolverhampton	2	1	1
Wycombe	1		1

SCOTLAND.

	Candidates.	Passed.	Failed.
Aberdeen	9	5	4
Banff	3	2	1
Dumfries	6	4	2
Dundee	2	1	1
Dunfermline	3	3	
Edinburgh	13	8	5
Elgin	1		
Glasgow	8	3	1
Greenock	1	1	5
Montrose	1		1
Perth	1		1

The Questions for Examination were as follows:—

LATIN.

Translate into English two or more of the following sentences:—

1. Hæc quum pluribus verbis flens a Cæsare peteret, Cæsar ejus dextram prendit; consolatus rogat, finem orandi faciat: tanti ejus apud se gratiam esse ostendit, uti et reipublicæ injuriam et suum dolorem ejus voluntati ac precibus condonet.
2. Eo circiter hominum numero sexdecim millia expedita cum omni equitatu Ariovistus misit, quæ copiæ nostros perterrerent, et munitione prohiberent. Nihilo secius Cæsar, ut ante constituerat, duas acies hostem propulsare, tertiam opus perficere jussit. Munitis castris duas ibi legiones reliquit et partem auxiliorum; quatuor reliquas in castra majora reduxit.
3. Colchicum macera cum acido in vase operto per dies tres; dein exprime, et sepone ut fæces subsidant; denique liquori colato spiritum adjice.
4. Sequenti aurorâ, sumat Olei Ricini quantum satis sit ad alvum solvendum.
5. What is meant by the term Ablative Absolute? and give two illustrations from Cæsar.
6. Write down the prepositions governing an accusative case.
7. Give the Mood, Tense, Person, and Number of each of the following Verbs:—prendit, faciat, prohiberent, macera, adjice, sumat.
8. Explain the difference between Co-ordinative and Sub-ordinative Conjunctions, and furnish examples of each.
9. Name the kind of Verbs which admit of two Accusatives, and give one or more examples.

ARITHMETIC.

10. N. was born in 1769 and died in 1821, how old was he at the time of his decease? and how many years have elapsed between his death and the present time, 1872.
11. How much cloth is sufficient for a cloak which has in it 4 yards of 7 quarters wide of lining, the cloth being but 3 quarters wide?
12. If 3600 have bread for 35 days at 24 oz. each a day, how much a day may be allowed to 4800 men each for 45 days, that the same quantity of bread may serve?
13. Divide $3\frac{1}{6}$ by $9\frac{1}{2}$.
14. What is the value of ·625 of a cwt.?

ENGLISH.

15. Classify the simple pronouns.
16. Into how many classes are Adverbs of Time divided? Give several examples of each.
17. State the general rule for the formation of the Possessive Case, singular and plural, and give examples.
18. Give the Past Tense and complete Participle f the following verbs:—Cost, thrust, beat, build, awake, chide, sew, strive, shear, and cleave.
19. Parse the following:—The Moon threw its silvery light upon the lake.
20. Write from fifteen to twenty-five lines upon *one only* of the following subjects:—
    A. St. Paul's Cathedral.
    B. Easter Holidays.
    C. Boat Races.

NORTH BRITISH BRANCH PHARMACEUTICAL SOCIETY.

The fifth and last Scientific Meeting for the Session was held in 16, Princes Street, on Thursday evening, April 18th; Mr. BAILDON, President, in the chair.

There was a good attendance, and a Paper on "The Natural History and Commerce of Sponges," was read by Mr. JOHN GIBSON, of the Edinburgh Museum of Science and Art.

The paper, which was illustrated by specimens and drawings, and was frequently applauded, is printed at p. 865.

The CHAIRMAN moved a vote of thanks to Mr. Gibson, seconded by Mr. AINSLIE, and cordially carried.

In connection with this subject, there was laid on the table several very valuable specimens of sponges of various kinds adhering to pieces of rock, which had recently been procured from Smyrna, by Messrs. Macfarlane and Co., of Edinburgh, and by them presented to the Museum of the North British Branch. These were viewed with much interest, and frequently referred to during the reading of the paper.

Mr. MACKAY proposed a special vote of thanks to Messrs. Macfarlane for their valuable gift to the Society's Museum, which was seconded by Mr. BAILDON, and carried with applause.

The PRESIDENT then gave his valedictory address:—

In taking a very cursory review of the Session now about to close, I am sure you will agree with me that the North British Branch of the Pharmaceutical Society is under great obligations to those gentlemen who have so kindly given us scientific papers, viz., to Dr. Stevenson Macadam for his interesting lecture on, and experiments with, the colouring agents recently derived from

Coal Tar; to Dr. M'Kendrick for his experiments and lecture on Neurotics; to Mr. James Mackenzie for his paper on Pharmacy in Edinburgh in the Olden Time; to Mr. Wm. Gilmour for his paper on Volumetric Analysis; to Mr. Paton for one on the Museum, its position and requirements; and, lastly, to Mr. John Gibson for the lecture on Sponges we have just listened to with so much interest.

I need not remind you how attractive, as well as instructive, these lectures were; and although the attendance on them was not so numerous as the Council could have wished, still, upon the whole, it has been an improvement upon previous years.

I hope the time is not very far distant when the members of the Pharmaceutical Society will have made so much progress in the scientific and practical knowledge of their profession as to be able to advance the science of pharmacy by original papers and researches, so as to obviate the necessity we at present labour under of drawing so largely upon the kindness of our professional friends who are not directly connected with the Society. I am the more sanguine of this result from the firm stand we are now making against permitting any to enter the portals of our Society who are not able to pass with credit the Preliminary Examination. This is not only an act of kindness to the youth, but is a guarantee that he has received a liberal education. It is also very desirable that, in making his selection of this particular department of science, he should follow the bent of his disposition, and that he should not pursue it from a lower motive only. Should he be fond of his profession, he ought to be able to pass his Minor Examination before the expiry of his apprenticeship, if he avails himself of the advantages open to him in Edinburgh, Glasgow, Aberdeen and other large centres; and I hope the London Council will soon be able to make such arrangements as will facilitate the education of those who are placed at a distance from these centres.

I regret to state that the statistics of the last Session's Examinations show a result less favourable than the Council could have desired. We find that out of 189 candidates, only 124 passed. This shows a large percentage of failures, and indicates but too certainly that there is still much to be accomplished before we can realize the existence of scientific pharmacists throughout the length and breadth of the land.

I have now the pleasure of stating that, after a good deal of consideration, the Council have agreed, with the approval of the London Council, to acquire a lease of very commodious premises in St. Giles Street—a new street made by the directors of the Bank of Scotland, and which is central to both the old and new town. The Council have found it very difficult to obtain premises in all respects eligible. It trusts these may prove to be so. The building is a new one, and it will be November before the Society take possession.

This, you are aware, is a preliminary step in carrying out our friend Mr. Dean's views towards the formation of an extensive museum and library of reference worthy of the North British Branch of the Pharmaceutical Society of Great Britain. These spacious rooms will be open both during the day and evening to all the members of the Society.

I wish to remind both Assistants and Apprentices that the same liberality as formerly is continued by Professor Balfour and Dr. Stevenson Macadam; and I would urge upon all those who have not availed themselves of these advantages, to do so without delay. The best thanks of the Council are due to these gentlemen for the liberal arrangements they have made to facilitate the acquisition of a knowledge of botany and chemistry. It now only remains for me to offer you my sincere thanks for the kindness shown me during this my second tenure of the honourable office of President of the North British Branch of the Pharmaceutical Society.

Mr. YOUNG, in a few remarks, moved a vote of thanks to Mr. Baildon for his efficiency as Chairman, which was seconded by Bailie BLANSHARD, and unanimously carried.

The Secretary then laid on the table the Smithsonian Report, Report of the Proceedings of the American Pharmaceutical Association, and two numbers of the *Pharmacist*, also from America, all of which had been presented to the Society. Having intimated the arrangements for the approaching Session, the meeting adjourned.

ANNUAL MEETING.

The Annual Meeting took place in Elliot's Room, 16, Princes Street, on Friday forenoon, 19th April, at 12 o'clock; Mr. BAILDON, President, in the chair.

At the request of the CHAIRMAN, the SECRETARY read the following

ANNUAL REPORT.

"The Council have again to bring before the Annual Meeting of the North British Branch of the Pharmaceutical Society their usual Annual Report, and in doing so, desire to congratulate the members on the continued success and onward progress of the affairs of the Association.

"The compulsory nature of the legislation embodied in the Pharmacy Bill of 1868 is now commencing to bear the anticipated fruit, and one has only to glance at the number of candidates for the various examinations in London and Edinburgh throughout the past year, to be assured that the statement now made is a correct one. Perhaps special allusion might be made to one branch of the Society's requirements in connection with this subject, viz. the Preliminary Examinations, or the foundation on which the real scientific knowledge of the future chemist and druggist must of necessity be based.

"Referring to these examinations, the Council cannot help expressing regret that there should be so many failures; and they are ready to do this all the more, because they feel that the questions set by the Examiners are neither numerous nor difficult, and such as any youth of ordinary ability and education ought to master with comparative ease. To those young men more advanced than the apprentice, the questions still retain the same character, and ought to form no barrier in the way of entering for the Minor Examination.

"Since April of last year there have been examined in Edinburgh 189 candidates. These comprehend the Preliminary, Modified, Minor and Major. Of this number 124 passed and 65 failed. The percentage of failures continues to be so large that the Council hope considerable improvement will be made in this department ere the Report for another year is issued.

"Change in the accommodation necessary for carrying on the operations of the Society in Edinburgh, including Examinations, Museum, Library, Meetings, etc., has produced not a little discomfort and awkwardness. This, however, the Council are pleased to intimate is nearly at an end, as they have now the prospect before them of a more steady arrangement.

"The Society in London is about to lease the new rooms in St. Giles Street, in process of erection, near the Bank of Scotland, being not only a central position for the old and new town of Edinburgh, but in close proximity to the general railway terminus; occupation will, it is hoped, be obtained in good time to commence the next winter session of 1872–73.

"The same opportunities as to the teaching of Theoretical and Practical Chemistry continue to exist, while the approaching summer course of Botany in the Royal Botanic Gardens will be open as before to all students in Pharmacy.

"The Council take this opportunity of expressing their thanks to Dr. S. Macadam and to Professor Balfour for their kindness in admitting pupils studying Chemistry and Botany on such advantageous terms to their classes.

Of the opportunities thus afforded, it may be mentioned that during last session 15 took advantage by attending Chemistry, and 12 by attending Botany, or, in all, 27. The Council will be pleased to find these numbers very much increased during the next session.

"The Council feel there is still a want of sufficient energy in connection with the Evening Scientific Meetings; and, while they heartily thank those gentlemen who have contributed during the past winter to render them both pleasing and instructive, they do hope that when fairly in possession of the Society's own rooms, more ready and extended assistance may be given to increase the number and interest of these meetings.

"One great advantage among others will accrue when possession of the rooms is obtained, namely, that both library and museum will be made more available for those who are entitled to use them. And this (of course, under certain restrictions) at any time during the day or evening. Every effort will be made by the Council to accommodate those who may be disposed to take advantage of the privileges which will then be offered.

"The Council have taken all the means in their power to make known the date and place of their Annual Meeting, and will be glad to find that members and associates in business, in and around Edinburgh, as well as those at a distance, may find it convenient to attend and take part in the proceedings.

"Various proposals have been and are still agitating the minds of many, in and outside the Society, in regard to monetary grants to be provided for Provincial Education.

"The Council feel that the importance of this question cannot be over estimated, nor can they deny that the difficulties in the way of coming to a fair and equitable conclusion of the matter are numerous, and not easy to overcome. Still, they have every confidence in believing that the London Council, who hold the reins, will give this important subject due consideration, and that they will yet be able to prepare and launch a plan, which, while it will effect the object in view, will also prove satisfactory to all who take an anxious part in desiring the education of the young pharmacist.

"It has been usual to submit to the Annual Meeting a statement of accounts for the preceding year. This has, however, already been done up to 31st December, 1871; and, after being properly vouched, sent to London, in order that it might pass through the Finance Committee there, and afterwards be presented at the Council Board.

"In closing the Report, and looking forward to increased space and additional cases for the Society's Museum, the Council will be pleased to receive presentations from any one disposed to contribute. Proposed specimens may be intimated to the Curator of the Museum, or to the Secretary. Show cases, bottles, or jars will be willingly supplied for any articles requiring them."

Mr. Anderson, of Musselburgh, Mr. Young, Mr. D. R. Brown, and several other gentlemen made some remarks on the clause in the Report wherein reference was made to anticipated grants in connection with education, the indications of which were a strong desire that very soon the London Council would see their way to carry out the feeling now so largely and almost universally held on this subject, and hoped that without much further delay a portion of the funds of the Society would be so judiciously distributed as to assist the cause of education in certain districts, where, at present, sufficient facilities do not exist for educating apprentices and others.

Thereafter the adoption of the Report was moved by Mr. Baildon, chairman, seconded by Mr. Fairlie, of Glasgow, and carried unanimously.

Mr. Anderson, of Musselburgh, then proposed Mr. H. C. Baildon as president, and Mr. Wm. Gilmour as vice-president for 1872-73, which was seconded by Mr. Frazer, of Glasgow, and carried unanimously.

Both gentlemen made suitable replies.

The Meeting then proceeded to elect the Council for the next year, and after ballot had been taken the following were declared duly elected.

Messrs. the President and Vice-President of the North British Branch, and W. Ainslie, D. R. Brown, G. Blanshard, J. Gardner, A. Noble, R. Raimes, J. R. Young, Fairgrieve, A. Napier, Heron, James Aitken, and Kinninmont, Frazer, Davison and Fairlie, of Glasgow, with the President and Vice-President of the Society in London *ex officio.*

The following gentlemen were then nominated as Examiners for 1872-73, viz.:—

Messrs. Buchanan, Ainslie, Aitken, Kemp, Gilmour, Young, Noble, and Kinninmont, of Glasgow.

Library and Museum Committee: Messrs. Aitken, Brown and Mackay.

Mr. Brown to be Convener.

Mr. Paton was re-appointed Curator of Museum.

Mr. Baildon proposed that Mr. Mackay be requested to continue to act as Honorary Secretary to the North British Branch, and in doing so expressed his sense of the valuable services which Mr. Mackay had for so many years rendered to the Society. He alluded to the amount of labour which Mr. Mackay had had during the past year in connection with the arrangements for the new premises in which the Society are about to enter, and to the satisfactory result attained, and trusted that Mr. Mackay may be long spared so as to see the success of his arduous services in connection with the Society.

Mr. Mackay replied.

In connection with the retirement of Mr. Brown as one of the Examiners in Edinburgh, Mr. Kemp begged to propose a special vote of thanks to that gentleman for his able and great services connected with the office, which he had so long efficiently filled. Mr. Kemp expressed much regret that the step now taken by Mr. Brown should have been occasioned chiefly on account of his failing health, but could not resist taking this opportunity of remarking how much they had been indebted to Mr. Brown for the important aid which he had given to the Society. Mr. Brown's position and scientific attainments were of no ordinary description, and he knew of no one whose presence would be more missed at the Examining Board than Mr. Brown.

Mr. Baildon seconded this, and conveyed the thanks of the Meeting and the Society to Mr. Brown, who made a very feeling reply, referring to the great pleasure which he had always had while giving his assistance to carry on the affairs of the Society.

Before separating Mr. Mackay called for a hearty and cordial vote of thanks to Mr. Baildon, who had for a second time acquitted himself so ably and so well in guiding the affairs of the North British Branch, and stated that he felt all the members were under a deep debt of gratitude to Mr. Baildon for the more than efficient manner in which he had conducted business as President.

Mr. Baildon replied, and the Meeting adjourned.

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

The Eleventh General Meeting was held at the Royal Institution, April 11th. The President in the chair.

Mr. W. Morris, chemist, West Derby road, was elected a member.

The following donations were announced:—A set of MSS. Prescriptions from Thomas Hyde Hills, Esq., current numbers of the Pharmaceutical Journal from the Society, and the "Proceedings of the American Pharmaceutical Association, Sept., 1871," from the Association.

The President (Mr. E. Davies, F.C.S.), then read a paper on "Artificial Alizarine," of which the following is an abstract:—

Modern chemistry is characterized by the special importance given to synthesis. Since urea was formed artificially efforts have constantly been made to imitate the work of nature, and build up by chemical art the products found in vegetables and plants. A large measure of success has attended these investigations, and not only are we year by year getting more mastery over this, at one time thought hopeless field of work, but in the examination of the substance to be imitated we get more knowledge of it. Particularly was this the case with alizarine; misled by inaccurate analysis experimenters were working in the wrong direction, until Messrs. Graebe and Liebermann began by getting a clear insight into the constitution of alizarine, and then knowing what had to be done, they, by a brilliant application of theory, obtained what may be considered to be the greatest triumph which chemistry can boast for many years past. Alizarine, the colouring principle of madder, has been the subject of many investigations, but from the difficulty of getting it pure the analyses were not concordant, and the formulæ proposed for its composition were not only varied, but, as it turns out, all wrong. Schunck believed it to be $C_{14}H_{10}O_4$, which is only in error by having 2 H too many. Strecker believed it to be $C_{10}H_6O_3$.

Graebe and Liebermann treated pure natural alizarine with powdered zinc. This reducing agent produced a hydrocarbon $C_{14}H_{10}$, which was proved to be identical with anthracene—a solid body contained in the best products of the distillation of coal tar. Having thus got anthracene from alizarine, the next step was to make alizarine from anthracene. They proved by their experiment, above-mentioned, that alizarine had not the composition assigned to it. It was almost certain that it was really $C_{14}H_8O_4$, and on this assumption, which has turned out to be correct, they worked. In 1861, Professor Anderson, of Glasgow University, had studied the anthracene compounds, and found that by the long-continued action of dilute HNO_3, specific gravity 1·2, a crystalline body was formed, to which he gave the name of oxanthracene $C_{14}H_8O_2$. This is now called anthraquinone for the following reason: from quinic acid contained in Peruvian bark a substance, quinone, $C_6H_4O_2$, is obtained. This is derived from benzol, C_6H_6 by replacement of 2H by 2O, one O partly saturated by the other O. Quinonic acid, $C_6H_4O_4$, is obtained by action of of potash on quinone. In like manner, we have $C_{14}H_{10}$ (anthracene), and $C_{14}H_8O_2$ (anthraquinone), and Graebe and Liebermann assumed that alizarine was the corresponding quinonic acid. Alizarine is an acid, and may be called alizaric or anthraquinonic acid. The first method adopted was to convert anthraquinone, $C_{14}H_8O_2$, into bibromanthraquinone by the action of Br. This gave $C_{14}H_6Br_2O_2$, and by heating with concentrated solution of KHO the Br was replaced by KO, forming $C_{14}H_6O_2(KO)_2$. This was decomposed by HCl giving $C_{14}H_6O_2(HO)_2$, or alizarine.

This method was, however, too expensive for practical purposes, owing to the high price of bromine, and the original inventors, together with Mr. Perkin, the inventor of mauve, worked in another direction. The anthraquinone was converted by the action of H_2SO_4 into disulphoanthraquinonic acid $C_{14}H_6O_2\left\{\begin{matrix}HSO_3\\HSO_3\end{matrix}\right.$ Potash then converted this into alizarine. The alizarine thus produced is in all respects similar to natural alizarine. The crystals are red needles in both cases, both give the same colour with KHO, and dye mordanted fabrics of the same colours, and equally fast. Cupric acetate gives the same purple colouration to the alcoholic solution; the absorption-bands in each are the same.

Anthracene is found to the extent of half per cent in coal tar, but it appears probable that a much larger amount may be obtained by the regulation of the heat in making gas. The importance of this discovery is seen at once on referring to some statistics of Dr. Roscoe in a recent lecture, where he shows that the annual production of madder is about 47,500 tons, worth £45 per ton, equal to £2,150,000. Of this we take about half, so that about £1,000,000 annually represents the sum which we pay to foreign countries for a substance which we may in future prepare at home. It is used at present for Turkey red dye, and some other styles of madder dyeing.

A vote of thanks to Mr. Davies for his interesting paper closed the proceedings.

TYNESIDE CHEMISTS' ASSISTANTS' ASSOCIATION.

At the rooms of the above Society, Mr. R. H. Rowell, Chemist, of Houghton-le-Spring, delivered a lecture on "Chemical Affinity."

There was a large attendance of members present, and the lecture, which was illustrated by a variety of experiments, was highly appreciated by the audience.

At its close some discussion arose, the chief speakers being Mr. B. S. Proctor and Mr. Simpson; after which a hearty vote of thanks was proposed by Mr. Shaw, seconded by Mr. Marshall, and carried unanimously.

Mr. Rowell responded in a few suitable remarks.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

Thursday, April 18th. The President, Dr. Frankland, F.R.S., who occupied the chair, announced the presence of Professor Himly, of Kiel, and of Professor Eschenburg as visitors.

After the usual business of the Society, the Secretary read two papers by Mr. E. A. Letts: "On Benzyl Isocyanate and Cyanurate," and "On a Compound of Sodium and Glycerine."

Professor Himly, who spoke in German, then gave an account of a new method of determining the carbonic acid in sea water, and of an apparatus for collecting the water at great depths, which could be immersed to the required distance below the surface, and there closed by means of stopcocks. These are turned by powerful springs, released at the proper moment by an electro-magnet.

There was also a short note by Dr. E. T. Thorpe, "On the Action of Phosphorus Pentasulphide on Tetrachloride of Carbon;" and another, "On the Degree of Solubility of Silver Chloride in Strong Nitric Acid," by the same author.

Dr. Hofmann, F.R.S., then gave a brief account of the new phosphorus basis which he had recently obtained by the action of alcoholic iodides on iodide of phosphonium in the presence of zinc oxide; and illustrated his remarks by several striking experiments.

The meeting was then adjourned until Thursday, 2nd May, when Mr. E. Riley will deliver a lecture on "The Manufacture of Iron and Steel."

PHILADELPHIA COLLEGE OF PHARMACY.

At the Pharmaceutical Meeting of this College on March 19th, a paper was read on the "Strength of the Officinal Tincture of Opium," by Mr. A. Shryock; and one on the "Amount of Moisture contained in Dried Drugs,' by Mr. G. W. Kennedy.

Professor Parrish presented, on behalf of Messrs. Cramer and Small, a specimen of fixed oil, obtained from 15 lb. of nux vomica, in the process for making the alcoholic extract. The weight of the oil was 2½ oz.; that of the extract after its separation, 18 oz. The oil was of a dark brown colour and very bitter to the taste.

Professor MAISCH remarked that he had not separated the oil in making this extract on the large scale, on account of its bitterness; but that by concentrating the tincture to a syrupy consistence, mixing a little water, and evaporating, the oil may be almost completely diffused throughout the mass.

Professor PARRISH prepared, in the presence of the meeting, a vial of emulsion of oil of turpentine by the process of Mr. J. W. Forbes;* and said that after many years' experience with this class of extemporaneous preparations he had found this plan to be a real improvement, both in regard to convenience and the perfection of the resulting preparation. He also showed emulsionized ether and chloroform made by the same process. In the latter, the chloroform, in consequence of its greater specific gravity, subsided in the vial, but was completely diffused by shaking.

Professor MAISCH exhibited some oil of *Eucalyptus globulus*, said to be used for the adulteration of other oils, it having a delicate odour, easily covered by bergamot and more powerful perfumes. The leaves yield six per cent. of the oil which is met with in commerce at from $1.50 to $2.00 per lb. Also a specimen of gurjim balsam, or wood oil, which he said is used in Germany for the same purposes as copaiba. It is obtained from several species of *Dipterocarpus*, indigenous to the East Indies, resembles copaiba in odour, though dark and opaque, and has a bitter taste. At 230° to 260° it becomes thick and almost gelatinous; above that temperature it is limpid.

At the Annual Meeting, which was held on the 25th March, the following officers were elected for the ensuing year:—*President*, Dillwyn Parrish; *Vice-Presidents*, W. Procter, jun., and Robert Shoemaker; *Treasurer*, Samuel S. Bunting; *Recording Secretary*, Charles Bullock.

CHICAGO COLLEGE OF PHARMACY.

The Annual Meeting of this College was held on Wednesday, March 6th, Mr. E. H. SARGENT, the President, in the chair.

After the reports had been read the PRESIDENT proceeded to deliver his address. The chief topic dealt with was the great calamity which, since the preceding anniversary, had overtaken their city. He expressed an opinion that while the conflagration, in its extent, the vastness of the injury, both public and private it caused, and the terrible suffering it entailed, was without a parallel in history, the world had hitherto seen no such exhibition of the goodness existing in the human heart as was manifest in the wonderful universal sympathy and benevolence to which it gave rise. In this overflowing charity the College and its members were not forgotten, and the whole-hearted efforts of their friends were the first glimmerings of light in their discouragement and gloom, giving them hope and energy to overcome the disaster. Immediately after the fire the druggists of New York placed a large fund in the hands of one of their number for the relief of those connected with the business who had suffered, and the druggists of San Francisco had sent a liberal contribution for the relief of any distressed member of the College. Of a different character, but quite as important in the reorganization of the College, was the benefaction of the Philadelphia College of Pharmacy, where books and specimens were being collected for the library and cabinet. From over the broad Atlantic, too, distant but not less generous friends had arranged for a most comprehensive endowment, including the refurnishing of the library and museum with a collection of books and specimens in many respects not inferior, and in some departments more complete than that they had lost. It was especially worthy of notice that the list of donors, embracing the names of those most eminent in English pharmacy, also contained those of a large number of students and apprentices, showing how deeply the sympathies of all were stirred by the misfortune. This notable feature of the gift would endear it to each one of them a thousandfold, and cause them to honour the young men and the system of instruction which led to such noble results. It must not be forgotten that these gifts would be a trust confided to their care to help them in the education and training of their clerks and apprentices to become qualified pharmacists, and that they would best show their appreciation of them by using all their energies to make the College more useful to students than it had ever before been.

At the conclusion of the President's address, Professor BARTLETT submitted the following resolutions, which were, on motion, adopted.

"Whereas, we have learned of the generous purpose of individuals, firms, and associations, in this country and Europe, toward this College, in making to us contributions of books, apparatus, etc., with the intention of re-establishing it among the institutions for the advancement of pharmaceutic science and art;

"Resolved, That we recognize on the part of the donors of these offerings, a kindly human sympathy; a highly complimentary appreciation of the works of this College, and a pleasing evidence of that common interest which binds together the cultivators of science in all countries."

"Resolved, That these contributions to the advancement of pharmaceutical science are received with a full sense of the responsibility which rests upon us, the recipients; and we hereby pledge ourselves to use our utmost endeavours to make this College worthy of the generosity which has been so kindly extended to it by its distant friends.

"Resolved, That we tender to each and every contributor the heart-felt thanks of each member of this College.

"Resolved, That the names of the donors be procured by the Secretary of the College, and preserved in a suitable form in the archives of the institution."

The following officers of the College for the ensuing year were then elected:—*President*, George Buck; *Vice-Presidents*, T. H. Patterson and J. W. Mill; *Secretary*, G. M. Hambright; *Treasurer*, A. C. Vanderburgh; *Corresponding Secretary*, Albert E. Ebert.

MEETINGS FOR THE ENSUING WEEK.

MONDAY.........*Medical Society*, at 8 P.M.
April 29. *Society of Arts*, at 8 P.M.—"Silicates, Silicides, Glass and Glass Painting." By Professor Barff (Cantor Lecture).
London Institution, at 4 P.M.—"Elementary Botany." By Professor Bentley.

TUESDAY ......*Royal Institution*, at 3 P.M.—"Development of Belief and Custom." By Mr. E. B. Tylor.
April 30.

WEDNESDAY ...*Pharmaceutical Society of Great Britain*, at 8.30 P.M.—"Pharmacy in Austria." By Mr. T. Greenish.
May 1. *Society of Arts*, at 8 P.M.
Royal Institution, at 2 P.M. — Annual Meeting.

THURSDAY......*Royal Society*, at 9 P.M.
May 2. *Royal Institution*, at 3 P.M.—"Heat and Light." By Dr. Tyndall.
Chemical Society, at 8 P.M. "The Manufacture of Iron and Steel." By Mr. E. Riley.
Linnean Society, at 8 P.M.

FRIDAY ....*Royal Institution*, at 9 P.M.

SATURDAY ......*Royal Institution*, at 3 P.M.—"The Star Depths." By Mr. R. A. Proctor.
May 4.

* See the paper describing this process, *ante* p. 747.

Notes and Queries.

*** *In order to facilitate reference, correspondents are requested to mark their answers in each case with the title and number of the query referred to.*

No notice can be taken of anonymous communications. All queries or answers should be accompanied by the name and address of the writer.

UNG. HYDRARG. OXIDI RUBRUM AND UNG. HYDRARG. NITRATIS.—Mr. C. C. Fredigke states, in the *Pharmacist* for February, that ung. hydrarg. oxidi rubrum may be preserved for an indefinite length of time by keeping it beneath a layer of glycerine half an inch thick. He has found ointment so treated to have just as fine an orange chrome colour after being kept eighteen months as when first made. He says also that the ung. hydrarg. nitratis may be prevented from becoming hard by incorporating with it, while warm, one-fourth of its weight of glycerine in small quantities at a time, rubbing after each addition until all the glycerine is extinguished. Ointment so prepared does not lose its fine citrine colour till after a year or more.

PREPARATION OF ABSOLUTE ALCOHOL.—Erlenmeyer (Annalen der Chemie und Pharmacie) proposes a slight modification of Mendelejeff's method of preparing absolute alcohol by distilling together alcohol having a specific gravity not higher than 0·792 with pieces of quicklime projecting above the surface, which only gives the middle portion of the distillate anhydrous. If, however, the alcohol and lime be heated by a water-bath for half an hour in a still connected with a return cooler, and then the cooler reversed and the alcohol distilled, Erlenmeyer states that the entire distillate is obtained in an anhydrous condition. If the alcohol contain more than five per cent. of water it must be submitted to the same treatment two or three times, but the lime should not at first project above the alcohol, and should be present in smaller proportion, as the rapid hydration endangers the still.

MISTURA CRETÆ.—The following is the formula according to which the specimen of mistura cretæ was prepared that was exhibited at a recent meeting of the Philadelphia College of Pharmacy (see *ante*, p. 775), in perfect condition after having been kept ten months:—

℞ Cretæ Præp. ℥ss
Glycerini ℥ss
Pulv. Acaciæ ʒij
Ol. Cinnamomi gtt. viij
Aquæ Dist. ℥viij

Mix thoroughly.

BROMIDE OF CALCIUM.—Mr. James R. Mercein, of Jersey City, communicates to the *American Journal of Pharmacy* the following method for the preparation of bromide of calcium:—A strong solution of hydrobromic acid is produced by passing sulphuretted hydrogen slowly into a half-gallon specie jar containing five ounces of bromine and two and a half pints of water, through a delivery tube touching the surface of the bromine, until all the bromine is taken up; the resulting liquid is filtered from the copious deposit of sulphur, gently heated in a capsule and again filtered. In order to free it from any possible impurity, it is distilled at a sand-bath heat until four-fifths has passed over. To the hydrobromic acid so obtained, precipitated carbonate of lime is added in slight excess; the solution evaporated by a water-bath to a syrupy consistence, removed from the bath and stirred till cool. The result is stated to be six ounces of bromide of calcium in fine granular powder, possessing every characteristic of the salt, and freely soluble in twice its weight of water, leaving a mere trace of residuum on the filter. The cost of preparation is one-fifth the market price of the commercial article, which frequently contains some uncombined lime.

EDIBLE FUNGI.—Meeting a friend some days ago, I found him bound upon an excursion to a certain pasture not far from the city, in search of what he called "Jew's lugs," with a dish of which, prepared into a kind of soup, he is in the habit of regaling himself once, at least, in the season in which they are to be found,—the early spring. I would be much obliged if you could inform me in your correspondence column, to what species they belong. The only thing I can find in any of my books under the name of Jew's ears, is *Exidia auricula judæ*, Linn., but they grow upon trees. These, however, grow in pastures, and only in a *few* places, at least hereabouts. They grow close to the ground with no stem visible. The specimens enclosed are somewhat shrunken, having been kept a few days.—W. M.

[*** The specimens sent by our correspondent were submitted to Mr. M. C. Cooke for examination, who writes as follows respecting them:—"The fungus sent to me is *Peziza venosa*. It is called Jew's ears in some parts of the country, and has long enjoyed the reputation of being edible, as well as *Peziza acetabulum*. Its odour, when stale, is more like that of the mushroom than any other *Peziza* with which I am acquainted. In the *Gardeners' Chronicle*, some time since, I think there was a letter published vindicating its esculent properties under the name of "Jew's ears," but I cite this from memory, and am unable to give more precise reference."—ED. PH. J.]

ADULTERATION OF OIL OF NEROLI.—Schramm states (Dingl. Pol. Journ. cci. 375) that copaiba oil may be detected in oil of Neroli, if present, by mixing a few drops with spirit and burning the mixture on cotton wool. When the spirit has burnt off, the smell of the copaiba oil can be distinguished.—*Journal of the Chemical Society.*

DANDRIFF.—The following remedy for this affection is taken from the *New York Druggists' Circular*:—

Carbolic Acid, ʒss
Oil of Bergamot, ʒj
Glycerine, ℥ij.

In addition, the frequent use of warm water and soap is recommended. See also *ante*, p. 637.

BOOKS RECEIVED.

AN EXPERIMENTAL RESEARCH ON THE ANTAGONISM BETWEEN THE ACTIONS OF PHYSOSTIGMA AND ATROPIA. By THOMAS R. FRAZER, M. D. Reprinted from the Transactions of the Royal Society of Edinburgh, 1872.

REPORT ON THE SANITARY CONDITION OF THE CITY OF LONDON, for the Year 1870-71. By H. LETHEBY, M.D., Ph. D., etc. Medical Officer for the City of London, etc. 1872. From the Author.

The following journals have been received:—The 'British Medical Journal,' April 20; the 'Medical Times and Gazette,' April 20; the 'Lancet,' April 20; the 'Medical Press and Circular,' April 24; 'Nature,' April 20; the 'Chemical News,' April 20; 'English Mechanic,' April 19; 'Gardeners' Chronicle,' April 20; the 'Grocer,' April 20; the 'Journal of the Society of Arts,' April 20; 'Grocery News,' April 20; the 'Milk Journal,' March, 1871 to April, 1872; 'Dublin Journal of Medical Science' for April; 'Proceedings of the Royal Institution'; 'Philadelphia Medical and Surgical Reporter,' Nos. 784 to 786.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Hospital Dispensing.

Sir,—My attention has been drawn to your leading article of this day's date on Hospital Dispensing.

I regret that you were not made acquainted with the real facts of the case, as you would then have arrived at a very different conclusion with reference to our dispensing department. They are as follows:—

One of our porters obtained from one of our qualified dispensers a supply of cough linctus, as if for himself, he having previously derived personal benefit from its use. He was allowed to have the medicine—the bottle being duly labelled—just as a servant or apprentice in a druggist's shop would be permitted to have medicine for his own use. Unfortunately, his object, good in itself, was productive of evil results. He gave it to a friend, by whom it was administered to his own child. The ultimate consequence was not therefore traceable to the hospital, but to the mistaken kindness of the porter and the misplaced faith of the parent of the child.

If you were to pay a visit to this hospital, I should be content to abide by your verdict as to our dispensing arrangements, which, looking to the extent of our out-patient department, are, I believe, as complete as any in London.

Wm. J. Nixon,
House Governor and Secretary.

London Hospital, Whitechapel Road, E.
April 20th, 1872.

[*** The hospital seems to have been inadequately represented at the inquest, when the facts detailed were accurately as described in our article, and led to a decided expression of opinion from the coroner and jury in condemnation of the arrangements so described. We are glad to learn from Mr. Nixon that the hospital has a better case than was then presented. The suggestion, that we should visit and report upon the dispensing arrangements, accords with an opinion which we have for some time entertained that such an inquiry, systematically carried out at all the hospitals, would be for the public good. We should not be unwilling to undertake it, if proper facilities were afforded.—Ed. Ph. J.]

Sir,—The following paragraph (which I fear has escaped your notice) certainly deserves insertion in the columns of your Journal, in order that it may not be lost to the pharmaceutical world, as illustrating the liberality of the Committee of the Dover Hospital:—

"According to the *Kentish Express*, the Committee of the Dover Hospital have appointed a dispenser at a salary of 5*s.* per week! We pity the patients."—*Medical Times and Gazette, April 13th*, 1872.

A hospital dispenser (from the responsible office which he holds) should be an educated and experienced pharmaceutist, one who has expended time and money in qualifying himself for the proper fulfilment of his important duties. To obtain such a man fair and even liberal remuneration should be given. Cases of accidental poisoning in hospitals (such as that reported in your last week's Journal) would then be of rare occurrence.

The Committee of the Dover Hospital can set but little value upon the lives of their patients when they pay their dispenser the paltry salary of £13 per annum.

F. J. Barrett.

Wolverhampton, April 22nd, 1872.

The Election of Council.

Sir,—In anticipation of the impending election, I am anxious to ask each voter to consider the claims of the Midland district, of which Birmingham is the great industrial centre, to a representative. It is at present unrepresented.

The Council of the Midland Counties Chemists' Association, at a recent meeting, unanimously resolved, on consideration of the subject, that Mr. John Churchill, of New Street, Birmingham, should be proposed as a suitable representative. He has accordingly been nominated, and appears in the published list of candidates who have accepted their nomination.

A kind but unknown friend has also, I find, nominated me; and though I have been solicited by several of my friends to stand, I have been compelled by various considerations to decline doing so.

May I, on this account, advance the request, and ask, apart from the personal claims of Mr. Churchill, and of the Midland district to a representative, that those who might have given their votes to me, had I elected to stand, would bestow them upon him. I am sure he will not disappoint the confidence of the constituency.

George Dymond,
President of the Midland Counties Chemists' Association.

Birmingham, April 23rd, 1872.

Co-operative Dispensing.

Sir,—I hope the discussion now being carried on as to the rights and the wrongs of apprentices may lead to a result of practical and permanent benefit to each party interested; at the same time it must be borne in mind that no hard-and-fast line can be laid down,—the time allowed and the facilities offered for study must necessarily vary, and it would be gross impertinence on the part of a London chemist to dictate to a provincial, and *vice versâ*. Let it be granted that proper facilities should be allowed, the details must depend upon the nature and requirements of the special business. But while we are trying to help the apprentice, cannot we do something to help ourselves? By so doing we should greatly assist him and make the business (we cannot yet call it a profession) worth the trouble and expense this high standard of education necessitates. No one living in London can fail to recognize the fact that the co-operative system is seriously affecting the retail part of a chemist's business, and unless means are taken to secure the dispensing of medicines to the duly qualified chemist, it will not answer the purpose of any one to enter the trade.

I think that agitation in this direction would be a perfectly fair and legitimate one for chemists, as a body; in the course of time it must succeed, and the sooner it is set about the better. Is it fair or reasonable to insist upon young men going through a course of study involving considerable expense, with the magnificent prospect of standing behind a counter and acting as agents for the sale of goods bringing no more profit than is obtained by his neighbour the grocer, who has at least the advantage of making ten times the return? Let the cry of the trade be "Agitate, agitate, agitate," but also "Educate, educate, educate." I believe it is to be done, and would meet with the support of the medical profession.

Henry Lawrence.

Kensington, W., April 20th, 1872.

Provincial Pharmaceutical Education.

Sir,—In reply to the remarks of J. P. (Sheffield), I would state that at the outset he admits a difficulty in maintaining a school in the country—the difficulty of finding qualified teachers, who have the leisure to teach—the men who are wished for having to attend to their own business.

J. P. says, "Either the lectures, etc., must be gratuitous or remunerated." Why should they be gratuitous? Does the student not have to pay for his instruction before he is bound apprentice? And why should he get teaching gratuitously afterwards? If the Pharmaceutical Society be induced to give instruction gratuitously, it would then be like a School Board, which has the power of taxing in order to provide instruction for those who cannot afford to pay for it. Of course, the student must pay for learning "from highly gifted gentlemen."

Again, J. P. states, "The expenses, incidental or otherwise, connected with attendance in London are such as to form a barrier to the majority of those who are apprenticed in the country." Form a barrier! Why should they? Ought any one to expect to acquire first-class instruction for nothing? Is any one authorized to enter a business without having the funds necessary to carry him through? And should the coffers of the Society, which J. P. says are so full—but which I doubt—be opened to assist this needy class?

"The school at Bloomsbury Square may, and does, answer for the metropolis, but is it suitable to the provinces? We provinces—answer, No!" I should like to know of whom this "we" consists. In the opinion of many well qualified to judge, the number of country schools (?) is sufficient, and in some cases more than sufficient, for all intents and purposes. Does J. P. desire to have a school in each provincial town? If so, has he ever thought of the expense of supporting each school? I dare venture to say that £200 a year could very soon be expended upon *one* country school if it were conducted properly. What, for instance, would a respectable, highly qualified teacher of chemistry (a great desideratum) require, say, for fifty demonstrations in practical chemistry, and fifty lectures=100 lessons? Is he not entitled to £100 for this? And how would this amount of money be raised? Could the local association contribute £50, and would the fees from the members in that country town amount to so much as to make up the £100—these fees of the members going at present into the Society's coffers according to J. P.'s views.

But only one subject is thus provided for. A teacher of chemistry might be got to go through a course of instruction for £30 or £40; but anyone who knows what sound chemistry is would immediately conclude that to do the job for this price, it would be done in a slip-shod manner; for £10 would be required for the demonstrations alone.

Then come difficulties connected with pharmacy, botany, and materia medica, subjects equally important with chemistry, but which I cannot now dwell upon. J. P. mentions a gentleman giving his services gratuitously. A competent person giving his labours for nothing is what we very rarely see. All those whose learning has cost much are not very willing to impart it for nothing. Some persons may be found to do so; but do they not do it for publicity, popularity, or applause, of which they soon become tired, finding it a losing game? Therefore an association should not rely upon voluntary teachers. It strikes me that the proper teacher, who would of course show his qualifications or diplomas, would demand, and justly so, a suitable recompense for his services. How many of our better chemists take apprentices for nothing? How many are willing to diffuse their learning gratuitously? Are they not authorized to expect a good return for capital invested in acquiring their knowledge? "Many associations are beginning to suffer." Yes, and in my opinion they always will suffer. I could say something on the impossibility of maintaining a school in the country; but this subject I must defer for the present.

Lastly, J. P. says, "Is it not the duty of the parent society to grant £300 a year to the provincial associations?" No! because doing so would be unfair, undesirable, impracticable, impossible. Again, why no? If the £300 were spent upon one association alone, it would not be a halfpenny more than would be required.

Let us look beyond our own body and profit by the experience of others. Has the Royal Veterinary College any country schools? Why? How many country schools has the Royal College of Surgeons? And why is it proposed to close them? How many other learned societies have not country schools, and why?

A Country Major Associate.

Tinct. Ferri Perchloridi.

Sir,—With reference to the note on Tinct. Ferri Perchlor. B. P., by Mr. Wilson, in a recent Journal, I would suggest the following as a still more simple and economical formula than the one he there gives:—

Liq. Ferri Perchlor. Fort. ℥v.
Aq. Destillat. ℥v.
Sp. Vini Rect. ℥x.

This I have been using for some time with most satisfactory results, and since the Spirit. Vini Rect. is not only a useless, but expensive ingredient, the above formula might, I think, be conscientiously adopted, the addition of water being preferable to glycerine, as it would be keeping nearer to the official form.

G. C. Druce.

Small Debts Bill.

Sir,—I am surprised no one has noticed your judicious reference to Mr. Bass's preposterous attempt at legislation on small debts. Every tradesman I have mentioned it to seems ignorant of the matter, and almost the universal remark is, "Surely a Bill attempting such absurd injustice will never pass;" but we see a man of business like Mr. Bass introduces it, and if no opposition is expressed, it may slip through the House. Surely every chemist should write to his member about it, and urge his neighbour tradesman to do the same. It would be worth while for each one also to send a post-card to Mr. Bass himself. This would surely prevent his ever attempting such a measure of confiscation again. No doubt his intention is to prevent the mischief caused by the "tally system," by which pedlars push their goods on foolish customers; but to interfere with all legitimate retail trade to do this, is as wise and as necessary as it would be for the police to handcuff every man and woman in a fair to prevent pocket-picking.

W. Symons.

Barnstaple, April 22nd, 1872.

A. P. S.—We consider that the means of preparation mentioned ought to be sufficient.

"*A Student.*"—Redwood's 'Practical Pharmacy.'

"*Inquirer*" (London).—You are recommended to use an equivalent quantity of chemically *dry* sulphate of zinc.

"*Inquirer*" (Aberdeen).—You would have to conform to the law prevailing in the particular State.

C. Andrews.—See an answer to a similar question at p. 660 of the present volume.

H. James.—A paper read by Mr. Abraham before the Liverpool Association, printed at p. 711.

X. Y. Z.—'How Crops Grow,' published by Macmillan and Co.

"*An Assistant.*"—(1.) No. (2.) No. (3.) It should be labelled, "Shake the bottle."

H. Edmonds.—We should think the Collodium Flexile, B.P. is intended.

"*A Student.*"—(1.) Yes, within a fraction. (2.) To prevent loss of phosphate of lime: see Dr. Tilden's 'Chapters for Students,' Vol. I. p. 844.

J. Horncastle.—We have applied to the author of the paper, who informs us that a reference to the original formula shows that the quantity should be one grain.

C. M.—(1.) One to three fluid drachms. (2.) Yes.

H. Rayson.—Vermin killers of any kind can only be sold by registered chemists and druggists. It is not necessary to label phosphorus paste, but we think it would be expedient to do so.

S. N. Holgate.—It is a point on which there is a difference of opinion whether vermin killers containing strychnine or arsenic should not be dealt with as directed for poisons in the first part of Schedule A.

"*Ranunculus.*"—Instructions are given in most elementary works on botany.

"*A* (*Very*) *Modified Man.*"—The subject is one upon which we cannot express an opinion; it is rather a matter for mutual arrangement between the parties concerned.

J. Smith.—Several memoirs by M. Pasteur on the subject have been read before the French Academy, and are printed in the 'Comptes Rendus.'

"*An Assistant.*"—The Pharmacy Act does not prescribe any restriction. With regard to the second part of the question, our correspondent's own sense of right and wrong should enable him to answer it as well as we could.

W. R. Richards.—(1 and 2.) We are not aware of any danger, or (3) any fatal accident that has resulted from its use. (4.) This question is upon a medical subject. (5.) It would depend upon the nature of the impurity.

"*Dominus Salus Mea*" and *W. H. Barr Hamilton.*—We have forwarded your letters to the Board of Examiners, who will doubtless take them into consideration before the next examination.

"*Chemicus.*"—Several recipes for the preparation are given in Beasley's 'Druggists' Receipt Book.'

W. Wilson.—The only notice of which we are aware, is in the second series, Vol. I. p. 42. We expect to be able to give some further information shortly.

"*Pharmaceutist.*"—The fruit of *Physalis Alkekengi* (N. O. Solanaceæ) is slightly acid, and is eaten in Arabia and some parts of the Continent. It is diuretic, and is used in veterinary practice.

Communications, Letters, etc., have been received from Mr. R. C. Mason, Mr. C. S. Miller, Messrs. Paris, Mr. Noble, Mr. Strachan, Mr. A. Tanner, Mr. Rimmington, Mr. Lamb, Messrs. Southall, Son, and Dymond, Mr. J. Abraham, Mr. Weaver, E. B., "Dulcamara," "Aroma."

PHARMACY IN AUSTRIA.*

BY THOMAS GREENISH, F.C.S.

Emerging from Saxon Switzerland on the borders of Bohemia, I recrossed the Elbe, and, after a day spent on the banks of this charming river, found myself in the fine old city of Prague. Here it was that I was first brought into contact with Austrian pharmacy, but as the whole of Austria is under one set of political laws for regulating the practice of pharmacy, as well as under one Arzneitaxe and one pharmacopœia, I shall defer my notice of the subject until I get to Vienna. In speaking of North Germany, I remarked that the pharmacies were in external appearance little more than private houses; but in the cities of Austria that I visited the case was different.

Most of the pharmacies in Prague had imposing plate-glass fronts, but no danger signal hung over the door, neither did a coloured carboy throw its glare into the street; the windows were kept studiously clear of everything but a few slips of porcelain, on which were the names of preparations much in demand, or proprietary articles, among which Liebig's Fleisch Extract occupied a prominent place. There is in this city a Pharmaceutical Society for Bohemia, which meets once a month; but it is as yet in its infancy, and possesses only a very small library. Membership is purely voluntary. In Prague there are 16 pharmacies to 180,000 inhabitants.

From Prague I passed on to Vienna. There, the pharmaceutical establishments are for the most part elegant, having windows of plate-glass scrupulously free from all obsolete symbols. One curious feature both in Prague and Vienna is the general use of signs attached to pharmacies, such as prevailed with shops in general in old London; thus—"Apotheke zum Goldenen Hirschen" (Golden Stag). From one generation to another the sign remains the same, however often the business may have changed its proprietor; probably this custom may be advantageous to a business during successive changes.

In Vienna, and also in each of the chief cities of Austria, there exists a pharmacists' Gremium, a legitimate corporation, as old as the pharmacopœia. This is an institution peculiar, as far as my experience goes, to Austria; and as it occupies a very important position with regard to the practice of pharmacy, and the education of the pharmacist, it is well that the distinction should be correctly understood between the Gremium and the Austrian General Pharmaceutical Society.

The Vienna Gremium dates from 1770, and includes all the pharmacists in that city, every pharmacist in Vienna being *ipso facto* a member of it. The same remark applies to the pharmacists of Prague and the other cities as regards their Gremiums. The Gremiums in the different cities are called chief Gremiums; these are independent of each other. There are also smaller Gremiums in the provincial towns, called *Filial* Gremiums, which also are independent of each other, but in connection with the chief Gremium of their district.

The duties of the Gremium are to receive and examine apprentices, discuss trade matters, look after the strict observance of Government regulations, exercise a certain discipline over its members, make proposals and offer advice to the Government, besides making the latter acquainted with the wishes and wants of the body. It never meets for scientific, but only for administrative purposes.

On the books of the Gremium every apprentice is entered as well as every assistant, and the name of the proprietor of every shop is registered. Before the Board of the Gremium the apprentice passes his "Tirocinal" or Minor Examination. This board consists of a president, vice-president, a Government medical officer, and three members, pharmacists, chosen from the Gremium. The president and vice-president are elected by the members for a fixed period, generally three years; they are recognized by the Government as the representatives of the Gremium in any matter connected with the authorities. It is with the Gremium only that the Government confers on matters connected with pharmacy, and it generally applies to that of Vienna. The Gremium meets four times a year, and all pharmacists are of necessity members of it, but they are only connected with the Austrian Pharmaceutical Society in so far as they have voluntarily joined that body.

In all the chief Gremiums there are benevolent funds for distressed members, and also pharmaceutical assistants. In that of Vienna, the fund is about £3500; the members pay together about £80 a year to it, and £250 is spent yearly in affording immediate relief and permanent aid.

In the gymnasia, or classical schools, a youth passes from one class to another by certificate, the result of an examination; the certificate must be signed by the director and all the professors. The candidate for apprenticeship to an apothecary must bring with him his last certificate, showing that he has passed through four classes of the gymnasium satisfactorily. This would comprise such an education as I mentioned in connection with apprenticeship in North Germany. The certificate must be presented to the Board of the Gremium to which the apothecary to whom the candidate is to be apprenticed belongs, and in order to become an apprentice, no further examination is required. The term of apprenticeship is three years, during which time the candidate is engaged in learning practical pharmacy, with time for study, and the opportunity of attending lectures. At the expiration of his three years he is again taken to the Gremium by his principal, and has to pass before that Board his Tirocinal, or Minor Examination.

This examination comprises botany, materia medica, chemical and pharmaceutical preparations. He must also read and translate prescriptions, and give proof of practical skill in pharmacy. Having passed this examination, he receives a certificate, signed by all the examiners, with the seal of the Gremium attached to it. He now becomes an assistant, in which capacity he must serve two years in a shop, but he cannot yet become the proprietor of one; and for every young man in an establishment with this qualification only, the proprietor is responsible.

At the expiration of two years thus spent, the assistant acquires the right of attending lectures at the university, where he must remain two years or four sessions. In the first year he takes mineralogy, botany, zoology, and physics. At the expiration of his first year, he must pass an examination entitling him to enter the second year's classes

* Read at the Evening Meeting of the Pharmaceutical Society of Great Britain, May 1, 1872.

In the second year he takes pharmacognosy, chemistry,—analytical, organic and inorganic,—and pharmaceutical legislation, together with laboratory work. At the end of the second year he undergoes his second examination; if successful, he receives his pharmacist's diploma, which entitles him to undertake the independent direction either of the establishment in which he has served, or of any other, or he can establish a new business if he gets the Government concession.

There is an annual visitation of pharmacists' shops. In university towns the commission for that purpose consists of the Dean of the medical faculty, the professors of botany and chemistry, and the two presidents of the Gremium. The result of the examination is noted in a protocol, which is signed by the examiners, and countersigned by the proprietor of the shop, and always forwarded to the Government. In smaller provincial towns the examination is made by the Government medical officer alone. The fee for such an examination is six ducats, or £2. 14*s*. for university towns, and three ducats for smaller ones. If the result be unsatisfactory, a second examination takes place after a short interval, and for this another fee has to be paid by the unfortunate proprietor. Pharmacists in Austria think it very hard that they should have to pay for an examination made solely in the interests of the public

In Vienna there are fifty-nine pharmaceutical establishments to 600,000 inhabitants. It is curious to notice the different customs that prevail as regards dispensing. In England, as a rule, great care is taken to put an external application into a blue bottle, and label it with a coloured label. In Austria there is no difference made between external and internal medicines, either in the shape of the bottle or the colour of the label. Even if the bottle contains a poison, it is not permitted, by attaching a poison label, to inform the patient that the lotion prescribed by the physician contains a poison; neither is it permitted to translate a prescription for a patient. In fact, in Austria it is thought that we have made a mistake in printing the British Pharmacopœia in English, and some English pharmacists are of the same opinion.

Assistants have usually two half-days a week for recreation, and apprentices two hours or so every day for study.

I shall now pass on to the formation of the Austrian General Pharmaceutical Society. It was somewhere between 1830 and 1840 that the chemists of Austria first began to form themselves into a society, but in 1848, the year of the revolution, the society then existing at Vienna was closed by order of the Government. Great efforts continued to be made to get a concession for a general society of the pharmacists of Austria, and it may be said that it was not until 1860 that the Minister of the Interior acknowledged the statutes of the Austrian General Pharmaceutical Society. It has now been in existence eleven years, and numbers between 500 and 600 members from different parts of Austria. Its museum contains a large collection of materia medica, drugs, chemicals, minerals, etc. Its collection of cinchona barks is specially valuable; that of woods, more especially of the Coniferæ from America, of which there are about 200 specimens, very interesting; and its herbaria of plants extremely useful to the young students. These are all so admirably arranged, so neatly and accurately labelled, with printed catalogues of reference, that it reflects the greatest credit on this society. I may add also that all this has been accomplished as a labour of love by pharmacists who have retired from business. A laboratory also has just been completed, in which instruction is given to students; it is not intended for pharmacists alone, but also for meeting the wants of the public by the analysis of water, urine, soils, etc.

In the rooms of the Society lectures on chemistry, botany, and materia medica are delivered to apprentices three times a week. The Society holds annual meetings; every third year it meets in Vienna, and in the intervening years in one or other of the chief cities, such as Prague, Brunn, etc. The membership of this body being voluntary, and its annual general meetings being held in different cities, it approximates more nearly to our Pharmaceutical Conference than to our Pharmaceutical Society. There are separate Pharmaceutical Societies in Prague, Gratz, Lemberg, etc., but little attention is paid by them to scientific subjects; they deal chiefly with the social and business interests of the members, and do not, like the Vienna Society, provide lectures for apprentices.

Through the kindness of Mr. Hills I was favoured with an introduction to Mr. Waldheim, to whose courtesy I am much indebted. He is President of the Gremium, and Vice-President of the Austrian Pharmaceutical Society; and while he holds these positions neither the interests of pharmacists or of pharmacy are likely to suffer. It is hoped that an important alteration in the Apothekerordnung will be secured. At present, questions affecting pharmacy are determined mainly by medical men and chemists; and the alteration looked for in the new Apothekerordnung is that on all matters affecting the interests of pharmacy, pharmacists themselves may be largely represented and have more influence. In fact, great efforts are being made by the body to shake themselves free, and to show themselves worthy of freedom.

From Vienna I went down the Danube to Pesth, in Hungary. This city has a population of about 200,000, and 14 pharmacies; while Ofen, or Buda, on the opposite side of the river, has ten pharmacies to 58,000 inhabitants. Hungarian pharmacy, I am informed, is much behind that of Germany; at present the Austrian Pharmacopœia is used, but a hope was expressed to me by a Hungarian pharmacist, that they would soon have a pharmacopœia for Hungary; and considering, that of the mixed population of the Austrian Empire, Hungary numbers about ten millions, and also that Hungarian counsels have prevailed with the Austrian Government, it is quite possible that they may succeed in their wishes.

After Pesth I went to Salzburg, with its 20,000 inhabitants and four pharmacies, but this is not a place of sufficient importance to require any notice.

With Salzburg my inquiry terminated, and I returned through South Germany, the pharmacy of which I left to a more convenient season. Having time for reflection on my homeward route, I asked myself what were the impressions left on my mind by this inquiry into the condition of pharmacy in North Germany and Austria; whence this great excellence in the German Pharmacist. In education, scientific attainments, and social position, he appears to shadow forth the Pharmacist of the future for Great Britain. It appeared to me, in the first place, that the sound education required of the candidate for apprenticeship was very important; while at school he can only rise from class to class by undergoing an examination, and it is only after he has passed through four classes that he can obtain the certificate without which he is not received as an apprentice. In the next place, during his three years' apprenticeship—and three years is ample time for apprenticeship—he is allowed two hours a day for study, and his employer is required by the Apothekerordnung to assist him in his studies, by providing him with books and instruction. The employer is reminded that there are duties as well as rights, trouble as well as profit, in the proper education of the apprentice. Whilst on this subject I will read some very pertinent remarks from the Prussian Pharmacy Laws, which merit careful attention by those who take apprentices.

"All apothecaries may take apprentices, but as they sometimes study their own advantage more than they do that of the apprentice or the public, the following has been made binding:—They must only take such apprentices as have by nature good parts, and as are sufficiently prepared by education and good moral training. In order that apprentices may not be taken from school too soon, it is enjoined that they do not leave before the age of 14; and as the knowledge of the Latin language is indispensable for properly understanding prescriptions, no apprentice shall be taken until he can translate easy passages from a Latin author. The decisions shall not be left to the masters themselves, but it shall be their duty to let the *intended* apprentice be examined by the Government Medical Officer. The master has further to see that the intended apprentice writes fluently and distinctly; this is particularly necessary to prevent mistakes occurring and the patient being misled by illegible writing.

"It is the duty of the master to provide proper books for the apprentice. It has occurred that apothecaries in many places have had other business than that of an apothecary to attend to, and that sometimes they have no *assistant*, but only three or four apprentices instead, and they prefer to take the roughest and most ignorant of boys, and also those that are too young, because they could make use of them for the rough work in their other businesses; and as the practice has led to an increase in the number of mere mechanical chemists' assistants, it is hereby ordered that an apothecary be allowed to take only as many apprentices as he has qualified assistants. If the business be so inconsiderable that one person only be employed, then no apprentice can be taken unless it be impossible to procure an assistant, or that the master be sufficiently skilful to take the place of assistant.

"To prevent the increase of badly trained assistants, it is ordered that for the future no master shall give his apprentice a certificate until the said apprentice has been examined by the Government medical officer in the presence of his master. The examination shall refer to such subjects as he has a right to expect from so young a man. He shall be particularly examined as to his practical knowledge of pharmacy and handiness in doing ordinary work, as practical knowledge is of more importance than mere theory in an apothecary. Should it be found that he is not yet a capable assistant, it is the duty of the Government medical officer to inform him that he cannot yet leave his apprenticeship, but must remain until he has fully qualified himself. Should it, however, appear that the master is more in fault than the apprentice and that he has neglected him or shown his own incapacity to instruct him in the business of an apothecary, that master shall be forbidden to take another apprentice."

Then again, the Minor examination is a qualification for an assistant only; he cannot conduct the business in the absence of the principal, neither can he purchase a business for himself. Our Minor, less thorough in its character, and less crucial, is a qualification for business as a chemist and druggist. But those who believe that pharmacy is progressive must arrive at the conclusion that an alteration here is only a question of time. After the Minor, three years must be spent in the practical details of pharmacy, and then the assistant goes to the university. Here lectures with practical work occupy his time, and after two severe examinations he procures his diploma, a qualification which enables him to conduct a pharmacy.

It will be noticed that in the examinations both of North Germany and Austria a knowledge of those political laws which govern the practice of pharmacy is required of the student; and in practice he does understand the letter and spirit of those laws. In this country when questions arise immediately affecting the interests of pharmacists, it is not until the danger is at our door that the body at large can be made to understand them. Our position, as defined by the several Pharmacy Acts and Poison Regulations, is so imperfectly understood, that our strength, as a body, is weakened, and our influence diminished. In the old Apothekerordnung, it was imperative that every pharmacy should have a laboratory attached to it; this brought into existence small apparatus suitable to the requirements of a pharmacist desirous of making the preparations of the pharmacopœia for his own establishment, a want much felt in this country where our pharmaceutical engineers cannot be made to understand that an ordinary room may suffice for a very efficient laboratory, where an acre of ground is not available.

I hold it to be the bounden duty of every one that takes an apprentice to teach him, or cause him to be taught, to make every preparation in the British pharmacopœia, and this may be done at a very moderate outlay. He should also be taught the history of most of the substances which constitute our materia medica, as well as how to recognize them.

In every city and town in North and South Germany, and also in Austria, the number of pharmacies is limited by Government regulation; it averages one pharmacy to about 10,000 inhabitants, and unless the population very much increases, no addition is made to the number. When there exists an apparent necessity, an addition can take place by Government concession. The pharmacists having this privilege are obliged to charge all drugs, and dispense medicines according to the price in the Arzneitaxe. This name may convey to the British pharmacist an erroneous impression as to its use; it is not a tax, but a medicine price-list. To give you an idea as to its working, I will take this prescription:—

Acid Tannic 0·1
Opii Puri 0·025
Sac. Alb. 0·3
Dos. x.

	Pfennige.
Acid Tannic 1·0	3
Opii Puri 0·25	1·0
Sac. Alb. 3·0	3
Mixing the powder	8
3 weighings	2
Dividing the powder (3 pfennige each)	3·0
Box with gold label	2·3
	7·9*

This limitation of pharmacies by Government is the question of the day throughout Germany. There is in Berlin an Apothecaries' Assistant Society which is now working vigorously for the abolition of this privilege, while on the other hand, the pharmacists already in business are battling hard against the proposed freedom of trade.

I fear that these hasty sketches of pharmacy in North Germany and Austria, the results of a holiday ramble, are very imperfect, but they may serve to direct attention to what our colleagues are doing in that part of the Continent. Germany, as regards pharmacy, is on the eve of important changes. This month the 'Pharmacopœia Germanica' will be published; on the 1st August it will come into force throughout the whole of Germany, and in September of this year, the general meetings of the North German Pharmaceutical Society, numbering 14,000 members, and the South German Pharmaceutical Society will take place conjointly at Frankfort. The question of the amalgamation of the two societies, and of the acceptance, by the latter, of the statutes of the North German Pharmaceutical Society, will be raised and discussed. There will then be for the whole of Germany one State pharmacopœia, one code of pharmacy laws, one arzneitaxe, and one pharmaceutical society. In Austria, also, pharmacists are by no means idle; and throughout the whole of North Germany and Austria, the educational standard for pharmacists is being raised rather than lowered. The following is an extract from a letter which I have received from Dr. Schacht, of Berlin:—

"In 1872, we hope that the education of pharmacists in Prussia and in the whole of Germany will be as follows:—

"After three years' apprenticeship (half a year of apprenticeship being dispensed with if the candidate has occupied the first class of the Gymnasium), he will pass his Minor before a Government medical officer, and a pharmacist. This examination lasts one day, and will be practical and theoretical; he will have to make certain preparations, and he must possess some knowledge of the *laws which govern pharmacy*. He will have been three years apprentice, three years assistant, and two years at the University, and then be examined. Then he will have to serve one year in the army, during which time he may be a soldier, or an apothecary to the army. After nine years from the time of his apprenticeship, and having passed the examinations named, he will, as far as qualification is concerned, be in a position to purchase a business."

After a month's absence, with renewed mental vigour, and restored bodily health, I returned home to grapple with the present, and dream of the future of British pharmacy, which, unaided by the same special protection, but untramelled by over-legislation, will rise to its proper place among the pharmacies of Europe, enriching science with fresh discoveries, and returning some of those benefits of which it has hitherto been for the most part only a thankful recipient.

[*The discussion upon this paper is printed at p.* 894.]

* About 8*d*. English Money.

CONTRIBUTIONS TO THE HISTORY OF THE OPIUM ALKALOIDS.

BY C. R. A. WRIGHT, D.SC.

Lecturer on Chemistry in St. Mary's Hospital Medical School.

(*Continued from page* 848.)

(2.) It being assumed that the molecules of codeia and morphia contain respectively either C_{18} and C_{17} or C_{36} and C_{34} (which latter is probably the case, experiments now in progress indicating that the molecular formulæ of these bases are double those usually ascribed to them), the above experiments lead to the conclusion that there exist polymerides of these alkaloids containing C_{72}, C_{144}, ... , or C_{68}, C_{136}, ... , these polymerides being formed by the action of strong acids, and serving as starting-points for new series of derivatives; experiments to obtain these polymerides in an unaltered condition are, as has been previously stated, in progress, and apparently with success.

This facile disposition to form polymerides is not an unknown feature in alkaloids, the experiments of Anderson having shown that the pyridine bases are characterized by this property; this fact would appear to warrant the speculation that morphia and codeia contain carbon groups analogous to, if not identical with, those contained in the pyridine bases; and, in fact, experiments now in progress, in conjunction with Herr L. Mayer, apparently lead to the conclusion that pyridine is obtainable from morphia derivatives by treatment which, though energetic, is nevertheless far short of destructive distillation: indeed, it may be doubted whether the carbon groups contained in the pyridine series of bases do not pre-exist in the bodies from which these bases are obtained by destructive distillation.

(3.) A comparison between the formulæ of the products obtained by the three hydracids HCl, HBr, and HI shows that while the action of HCl is simply to replace OH by Cl, or to remove the elements of H_2O (sometimes also replacing CH_3 by H), that of HBr is (in addition to the changes produced by HCl) to cause the addition of hydrogen to that one of the two resulting products that is derived from the non-polymerized molecule. Thus—

HCl and codeia give $C_{17}H_{17}NO_2$, apomorphia,
HBr ,, ,, $C_{17}H_{19}NO_2$, deoxymorphia,
which may be represented as $C_{17}H_{19}NO_3-H_2O+H_2$.

This hydrogenizing action is carried still further in the case of the derivatives obtained by HI; thus the expressions—

$$4C_{17}H_{19}NO_3-2H_2O+2HI+H_8,$$
$$4C_{17}H_{19}NO_3-6H_2O+2HI+H_{16}$$

represent the composition of the bases obtained respectively from morphia and codeia at 130°.

(4.) Codeia appears to be a species of methylic ether of morphia, their relative constitutions being probably—

$$C_{17}H_{17}NO\left\{\begin{matrix}OH\\OCH_3\end{matrix}\right. \text{ and } C_{17}H_{17}NO\left\{\begin{matrix}OH\\OH\end{matrix}\right.$$

(doubling the formulæ will not alter their relations in this respect). Adhering to the formula hitherto employed, the production of the same apomorphia from both alkaloids is readily accounted for thus:—

$$C_{17}H_{17}NO \left\{ \begin{matrix} OH \\ O.CH_3 \end{matrix} \right. + HCl = C_{17}H_{17}NO \left\{ \begin{matrix} Cl \\ O.CH_3 \end{matrix} \right. + H_2O,$$

Codeia. Chlorocodide.

$$C_{17}H_{17}NO \left\{ \begin{matrix} Cl \\ O.CH_3 \end{matrix} \right. = \left. \begin{matrix} Cl \\ CH_3 \end{matrix} \right\} + C_{17}H_{17}NO \left\{ O'', \right.$$

Chlorocodide. Apomorphia.

$$C_{17}H_{17}NO \left\{ \begin{matrix} OH \\ OH \end{matrix} \right. = H_2O + C_{17}H_{17}NO \left\{ O''. \right.$$

Morphia. Apomorphia.

According to this view morphia should contain two hydroxyl groups for every C_{17}, and codeia only one. Experiments are contemplated, with reference to this point, on the action of aniline, acetyl chloride, and glacial acetic acid, on these alkaloids, whereby it is hoped that definite information may be gained as to the presence, or otherwise, and the number of the groups CHO (aldehyde group), OH, etc.

(5.) It appears not improbable that codeia and morphia may contain in their molecules benzene residues. Schiff has pointed out* that phenols give colourations with ferric chloride, whereas the corresponding ethers or anisols do not do so; the well-known distinction between morphia and codeia in this respect, therefore, gives some support to the idea that both may be benzene derivatives.

III. *On the Physiological Action of some of the foregoing Derivatives.* By Reginald Stocker, M.B., Pathologist in St. Mary's Hospital Medical School.

Doses of one decigramme of the compound

$$C_{68}H_{81}I_2N_4O_{10},4HI$$

from codeia, and of the similar compound from morphia, were given to an adult terrier by the mouth without producing any perceptible effect whatever; when the dose was increased to three decigrammes, in each case repeated defæcation in the course of a few hours was produced, the stools being more loose than ordinarily and frequently of a dark greenish colour; no other symptom was noticeable, and no appreciable difference in the action of the two compounds was perceptible.

Doses of 5 decigrammes of the compound

$$C_{68}H_{82}I_2N_4O_{10}.4HI$$

from each of these sources were given to the same dog by the mouth with the result of producing similar repeated defæcation in the course of two or three hours; the sole difference discernible between these and the former experiments being that the effect was produced somewhat sooner and was of longer continuance in the latter cases, a result probably produced solely by the larger dose. No material differences were observed between the codeia and morphia derivative.

The same dog was employed throughout, two or three days being allowed to intervene between each experiment, so that the animal had recovered from the effects of a former dose before the administration of another.

It would hence appear that the derivatives of polymerized $C_{17}H_{21}NO_3$ are less active than those of polymerized $C_{17}H_{19}NO_3$; and also that there is no reason for considering the derivatives from codeia as different from those of morphia, the corresponding bodies having respectively the same quantitative composition and the same physical, chemical, and physiological properties.

Part V.

I. *On the Polymerides of Codeia.*

In Part IV. of these researches reasons have been adduced for the following general conclusions, viz., that codeia and morphia are capable of forming polymerides (with the elimination of methyl in the case of codeia in some instances), which yield derivatives containing certainly not less than C_{68}, and probably not less than C_{136} (C_{72} and C_{144} in the case of those codeia derivatives where methyl has not been eliminated). Experiments now in progress tend to show that the formulæ of codeia and morphia are really double of those formerly ascribed to these bases, *i.e.*, are

$$C_{36}H_{42}N_2O_6 \text{ and } C_{34}H_{38}N_2O_6$$

respectively, the proof of which is (as will be shown in a subsequent communication) that the first products of the action of hydrochloric acid on these bases appear to contain chlorine and carbon in the proportions C_{36} and Cl, C_{34} and Cl respectively, instead of C_{18} and Cl, or C_{17} and Cl. It might be anticipated, therefore, that intermediate polymerides might be formed containing respectively,

Morphia Series.			Codeia Series.
Monomorphia...	$C_{34}H_{38}N_2O_6$	... $C_{36}H_{42}N_2O_6$	Monocodeia.
Dimorphia	$C_{68}H_{76}N_4O_{12}$	... $C_{72}H_{84}N_4O_{12}$	Dicodeia.
Trimorphia	$C_{102}H_{104}N_6O_{18}$	... $C_{108}H_{126}N_6O_{18}$	Tricodeia.
Tetramorphia...	$C_{136}H_{152}N_8O_{24}$	... $C_{144}H_{168}N_8O_{24}$	Tetracodeia

In the case of codeia these anticipations have been verified.

In order to obtain these supposed polymerides before their further alteration by secondary reactions, the action of acids other than the hydracids was examined. Acetic acid seemed a probable agent for this purpose; but no appreciable quantity of anything different from ordinary codeia was obtained after sixty-four hours' digestion at 100° of one part of this base with three parts of glacial acetic acid. On precipitation of the product by Na_2CO_3 in large excess, extraction with ether, and agitation of the ethereal extract with HCl, a crystalline mass was obtained which developed a smell of acetic acid on standing in contact with a slight excess of HCl; but on analysis this gave numbers agreeing with those required for codeia hydrochlorate, and from it nothing different from codeia could be obtained; probably, therefore, only a trace of acetyl-codeia was formed.

The action of phosphoric acid, however, was found to lead to the desired result without the formation of by-products beyond colouring-matters formed by the high temperature employed; by heating codeia with three parts glacial phosphoric acid and 5 of water for several hours at 100°, no perceptible change is produced. The same result follows on boiling for twelve hours (boiling-point 105°) with an inverted condenser attached to prevent loss of water by evaporation; but if the boiling-point be allowed to rise slowly from evaporation, the mixture being very gently boiled in a long-necked flask, the product gradually acquires the power of giving an immediate amorphous precipitate with Na_2CO_3; no large amount of new substances are, however, formed until the boiling-point has risen to about 200°, beyond which point the evaporation cannot safely be pushed. The viscid chestnut-coloured liquid, while still hot, is dissolved in boiling water and allowed to cool; nothing separates on cooling; when cold, the liquid is nearly neutralized by caustic soda, and then precipitated with Na_2CO_3; the precipitate is collected on filters, drained from mother-liquors, dissolved in weak HCl, and reprecipitated by Na_2CO_3, to get rid of traces of unaltered codeia mechanically retained; finally, the drained precipitate is exhausted with ether. The ethereal solution yields on agitation with HCl a crystalline hydrochlorate, which may be purified by solution in water, fractional precipitation with Na_2CO_3 and repetition of the ether process, and finally, by re-crystallization of the resulting hydrochlorate.

(To be continued.)

MEETING AT HULL.

A meeting of the members of the Pharmaceutical Society of Hull was held at their room on Tuesday, April 30th.; Mr. A. Pickering, President of the Hull Chemists' Association in the chair.

It was unanimously resolved to support the list of fourteen names proposed by the United Defence Association.

* Ann. d. Chem. u. Pharm., vol. clix. p. 518.

THE PROPOSED DINNER AT THE CRYSTAL PALACE.

With the view of affording the members of the Pharmaceutical Society, and old pupils of the School of Pharmacy, who may come to London to attend the Annual Meeting on the 15th May, an opportunity of meeting their fellow-members in the metropolis and other friends, a Public Dinner will take place at the Crystal Palace on Tuesday, the 14th of May, at six P.M.

The PRESIDENT in the chair.

STEWARDS.

Allchin, A., London.	Linford, J., London.
Atherton, J., Nottingham.	Mackay, John, Edinburgh.
Attfield, Professor, London.	Mackey, J. B. London.
Barron, F., London.	Martindale, W., London.
Betty, S. C., London.	McCulloch, F., London.
Bottle, Alex., Dover.	Malden, W. W., London.
Bremridge, Elias, London.	Paul, Dr., London.
Barnes, J. B., London.	Preston, Alfred, London.
Bentley, Professor, London.	Redwood, Professor, London.
Brown, W. S., Manchester.	Robbins, John, London.
Bourdas, J., London.	Radley, W. V., Sheffield.
Burden, E., London.	Sandford, G. W., London.
Cracknell, C., London.	Savory, C. H., London.
Deane, Henry, Clapham.	Squire, William, London.
Davenport, J. T., London.	Shaw, Jno., Liverpool.
Down, Dr. Langdon., London.	Smith, E., Torquay.
Evans, H. S., London.	Stoddart, W. W., Bristol.
Frazer, D., Glasgow.	Schacht, G. F., Clifton.
Gale, S., London.	Southall, W., Birmingham.
Greenish, T., London.	Starkie, R. S., London.
Giles, R. W., Clifton.	Schweitzer, J., Brighton
Haselden, A. F., London.	Tilden, W. A., D.Sc., London.
Hill, A. B., London.	Urwick, W. W., London.
Hills, T. H., London.	Wade, Jno., London.
Hodgkinson, W., London.	Williams, Jno., London.
Hampson, R., London.	Warrick, R. B., London.
Howden, R., London.	

Gentlemen willing to act as stewards will oblige by forwarding their names to the Hon. Secretary. Dinner tickets, including wine, one guinea each.

In order to make the necessary arrangements and prevent discomfort, members and *their friends* desirous of being present are requested to apply *at once* for tickets, enclosing a P. O. O. for the amount, to Mr. BREMRIDGE, 17, Bloomsbury Square, W.C., or the Hon. Sec., MICHAEL CARTEIGHE, 172, New Bond Street, London, W.

Grenadier Guards' Band under the direction of Mr. Dan Godfrey.

THE EARLY CLOSING MOVEMENT AT CHELTENHAM.

A Meeting of the Chemists and Druggists of Cheltenham was held on the 25th April, to take into consideration the following memorial of the assistants and apprentices in their employ:—

"Gentlemen,—We, the assistant chemists and apprentices of Cheltenham, viewing with satisfaction the success which has attended the efforts made in some of the principal trades in the town, to diminish the hours of labour during the summer months, most respectfully pray you, our employers, to reduce the hours of business in our profession.

"We feel we can venture to ask this, not only on account of a want of sufficient time for physical and mental recreation, but also because of the higher educational demands which the late Pharmacy Act imposes upon us.

"We most respectfully beg to suggest that the hours of closing least likely to operate with disadvantage to the trade or the public, will be five o'clock on each Wednesday, and eight o'clock on other evenings, throughout the summer,—from the beginning of April to the end of September."

The following resolution was proposed, seconded and carried unanimously:—

"That this meeting, while desirous of shortening the hours of business, and of joining, as far as circumstances will admit, in any generally adopted arrangement, on the part of the various trades of the town to attain that object, regrets its inability to meet the request of the assistants and apprentices, so respectfully stated in their address to the chemists of the town."

THE VISIT OF THE BRITISH PHARMACEUTICAL CONFERENCE TO BRIGHTON.

A Meeting of the Chemists and Druggists of Brighton was held at the Town Hall on Wednesday, April 24th, under the presidency of Mr. W. D. SAVAGE, with the object of discussing what steps should be taken in reference to the projected visit of the British Pharmaceutical Conference in August next. It was unanimously decided that the Pavilion Committee should be communicated with respecting a suitable room where papers might be read and the Conference business transacted. It was also resolved that a dinner should be given to their *confrères* at the close of the first day's business; and that on a subsequent day, provided the weather be favourable and a sufficient sum of money be raised, to organize a picnic to the Dyke. The treasurer, Mr. Thomas Glaisyer, reported favourably of the response to his appeal for funds, and said that further communications would be made to the local secretaries at Lewes, Hastings, Eastbourne, Worthing, Horsham and other places.

MANCHESTER CHEMISTS' ASSISTANTS' ASSOCIATION.

The Annual Dinner of this Association took place on Thursday, April 25th, at the Mitre Hotel. Covers were laid for thirty. After the repast the Secretary's report was read. The usual toasts followed which, with music and songs, concluded this thoroughly enjoyable social reunion.

The General Meeting (for the election of officers for the next session) is postponed owing to the removal from the rooms recently used by the Association.

LETTER ON PROVINCIAL EDUCATION.

The following copy of a letter sent to the Presidents of several Provincial Associations who responded to Mr. Radley's communication of February 15th has been forwarded to us by the writer:—

"*Sheffield, April* 30*th*, 1872."

"Dear Sir,—In reference to my former letter on the steps taken by the Council of the Pharmaceutical Society with regard to provincial education, I have to thank you for the prompt manner in which you dealt with it by bringing the subject before your association. The object I had in view was to ascertain the general opinion of chemists in the country on the question, and to take action thereon if it was deemed desirable.

"It is remarkable that my letter struck a chord which immediately vibrated through the body politic, and drew forth a response which betokens a wide-spread dissatisfaction with present arrangements in this particular. No doubt you will have noticed the discussion which took place on this subject at the last meeting of the Council, as reported in the Journal of April 6th, from which it appears the Council is prepared to reconsider the matter with a view to a more liberal use of the funds of the Society in aiding pharmaceutical education throughout the country. This being the case, it seems to me undesirable at present to convene a meeting of delegates of provincial associations, but that a wiser course will be to wait awhile and reserve our strength for future action if the necessity continues. The Annual Meeting will probably afford an opportunity of bringing the subject before the Society. Will you have the goodness to make known the contents of this letter to the members of your Association? and believe me to remain, yours truly,

"W. V. RADLEY."

The Pharmaceutical Journal.

SATURDAY, MAY 4, 1872.

Communications for this Journal, and books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE RELATION OF THE PHARMACEUTICAL SOCIETY TO EDUCATION.

THE action of the Pharmaceutical Society in regard to Education is a subject which has recently cropped up from time to time, in these pages, and, in the form either of an address, an essay, a letter, or the report of a provincial association, various opinions have been expressed respecting it. But generally the reference to this subject has been either purely incidental, or so far superficial that only certain of its aspects have been dealt with.

Even the recent idea that the Society should provide educational facilities for students in the provinces does not appear to have excited sufficient enthusiasm to produce any response to our suggestion that it should be discussed in these pages; and though "provincial education" has since assumed a prominence to some extent commensurate with its importance, the expression of opinion on this subject has been almost entirely one-sided. Possibly the majority of our members are satisfied with the present position of the Society in this matter; it is one which has cost much labour, time, and money to mature, and, therefore, it should not be lightly set aside.

On the other hand, there is evidence that many do not understand what the existing relation of the Society to Education really is. Some who have spoken or written on the question evidently labour under considerable misapprehension on this point.

Thus we have, in the first place, one who is a pioneer in the matter treating the Society's School as being simply metropolitan, while another prominent thinker gives the Council credit for promoting the education of provincial men only to the extent to which it has subsidized local effort by small grants. And a third eloquent leader in Pharmaceutical policy evidently regards the School in Bloomsbury as benefiting only London and its suburbs. Now, as a matter of fact, four out of five students in the Society's laboratory are young men who come from the country specially to study there, with the object of passing the Society's examinations, and they return to the country as soon as that object is accomplished. This has, indeed, always been the case.

When, therefore, presidents and members of provincial associations base their arguments for grants in aid of local schools upon the erroneous assumption that the funds expended by the Council on education do not benefit the provinces, they place themselves in opposition to fact, and miss the really cogent argument they might urge in support of their views. The School of Pharmacy, in Bloomsbury Square, is in reality far more provincial than metropolitan; if the provinces have chiefly contributed to its support, the provinces have received the chief benefit. In this respect it resembles most other metropolitan institutions, or, in fact, London itself, which, unlike most other towns, has not been placed in its proud position solely by the energy of its merchants and traders—is not ever striving to outstrip a rival, for it has none,—is, indeed, scarcely a town at all, containing as it does several towns, two cities, and some half-dozen boroughs, but is rather a provincial centre. So the Society's School is the School of Pharmacy of Great Britain, located in the most convenient centre; while in respect of organization, funds and students, it is what the counties generally, and not merely Middlesex and Surrey, have made it.

In short, the members of the Pharmaceutical Society have successfully established one central school of which all are proud. We might, moreover, add that London, the centre at which all English candidates for examination attend, offers extra-collegiate facilities for pharmaceutical study at least equal to those of any town in the kingdom. But we refrain from multiplying such arguments, as our object is not to plead for the present school, but to state its true position in regard to metropolitan and provincial members of the Society. It is a question whether the advantages it offers are fully appreciated by all; but certainly they are not made use of as they should be, even by those who cannot plead the excuse that it is inaccessible; and though it may be matter for argument whether a second or third school of similar character should be founded elsewhere, it is much more a question of urgency to consider whether in view of the great difficulties of creating such establishments—comprising not only a lecture-room, laboratory, store-rooms, and other offices, but also a museum, library and professorial staff—it might not be desirable to endeavour to get more work out of the existing school, for its appliances are ample, for very much larger classes than have yet attended the Institution.

In saying this much, however, it must not be supposed that the importance of what is generally meant by the term "provincial education" is undervalued, or that the need for further educational facilities in the provinces is in the least doubted. Apart from other evidence, the action lately taken by several provincial associations fully proves the existence of a want in this respect, as well as the imperative necessity of providing for that want; and the question now to be considered is simply what part the Pharmaceutical Society should take in that direction.

Since the time when the Society's educational action assumed its present form, the general conditions to which the business of pharmacy is subject have been so far legislatively altered that there is, indeed, on this account alone, ample reason for reconsidering how far that action is sufficient or appropriate under existing circumstances; and it must be remembered that since the Society is now acknowledged as the governing power for the entire trade, it is not only in regard to members that its functions, in this respect or otherwise, have to be considered.

Regarding the subject from this point of view, and assuming that the attendance at the lectures and laboratory in Bloomsbury Square were very much more numerous than it ever has been, it may, nevertheless, be taken for granted that a very large majority of those who require pharmaceutical education could not come up to London for the purpose. To meet their case it would be necessary that they should have access to lectures during the time of their apprenticeship or while acting as assistants. But any measures taken to provide such a general system of teaching must evidently apply to the entire trade; and although it would be eminently in accord with the spirit of the Society's charter to promote such an uniform system of education, the fact that only about one-fifth of the trade are connected with the Society raises a difficulty as to the application of the Society's funds to the purpose. For this reason there seems to be some irrelevancy in the argument put forward by Mr. Baynes, Mr. Radley and others, that grants should be made to provincial associations as a return for the support heretofore given by country members to the Society. That argument might have considerable force as regards those connected with the Society, but it could not well be urged as a reason for the Society granting money to support provincial schools, unless at the same time it were seconded by the offer of liberal contributions from those who are not connected with the Society. Thus taking, for instance, the towns of Leeds, Sheffield and Hull, where the subject of provincial education has been very prominently mooted, it appears that the great majority of pharmacists in those towns do not belong to the Society. Even the number of registered apprentices and associates is far less than might have been expected, as will be seen from the following table:—

	Leeds.	Sheffield.	Hull.
Total number in business	112	100	102
Connected with Society	27	27	19
Associates not in business and Registered Apprentices	11	9	4

It is, therefore, an important point to ascertain how far any effort to establish provincial schools would be aided by the whole or even the majority of those in the trade. In regard to this point, we regret that so little has been done to carry out the suggestions offered in a previous article* on the subject, that our provincial friends should, by taking stock of their local wants and resources, ascertain what prospect they have of keeping up schools of pharmacy, as well as the means they can command for the establishment of such schools; but we hope the disposition since shown by the Council to deal with this subject in a liberal manner will yet be the means of bringing about such a course as we then suggested.

At the same time, we unhesitatingly deprecate the idea of making the provision for pharmaceutical instruction in any way partake of an eleemosynary character. In starting provincial schools, there probably must be, in many cases, some expenditure which cannot be at once recouped; but we have no faith in the utility of attempting to establish such schools, unless there be some decisive evidence that they will continue to be self-supporting. It is, moreover, very important to bear in mind that this condition has never yet been attained by our existing school.

Taking the general result of such attempts as have been made, it is too apparent that the aid required by "provincial education" is not so much money as interest on the part of those requiring to be taught.

Without dwelling too much on the failure that has characterized most attempts to establish schools of pharmacy in the provinces, it would be unwise to overlook this fact. It would be equally unwise to ignore the indifference to the claims for education prevailing in many cases among country chemists, or to disregard the disinclination of young men to enter upon the serious study of those subjects which should be mastered by every one who hopes to follow with credit the career of a pharmacist even in its most humble form.

How those obstacles are to be removed is a question well deserving the earnest consideration of every one desirous to raise the general status of the trade, and we hope those who have been active in making known the need of further educational facilities will, at the ensuing meeting, render the still greater service of demonstrating that there is also such a demand for them as would justify a liberal use of the Society's funds in promoting their establishment throughout the country.

An address from the students attending the class of practical chemistry at the Royal Veterinary College, has recently been presented to Professor Richard V. Tuson, expressing their appreciation of the advantages resulting from laboratory instruction, and congratulating him upon being the first to establish such a course in connection with that college.

The Annual Oration before the Medical Society of London will be delivered on Monday evening next, at the Architectural Society's rooms, Conduit Street, by F. J. Gant, Esq., F.R.C.S., upon "Modern Surgery as a Science and an Art." After the address a conversazione will be held.

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* Pharm. Journ. 3rd Ser. Vol. I. p. 388.

VOTING PAPERS.

We are requested to call attention to the Special Notice appearing in the front page of the Journal in conformity with a resolution of the Committee to which the matter was referred by the Council, and to point out that, in several instances, the list of candidates recommended by the Chemists' Defence Associations has been mistaken for the official voting paper of the Society and sent in to the Secretary under that impression.

ANNIVERSARY DINNER.

We have much pleasure in referring our readers to page 886 for particulars respecting this new feature of the Society's annual reunion, for which also we confidently ask the same enthusiastic co-operation which has made the Chemists' Ball and the Conversazione so eminently successful. Apart from the pleasurable attractions of the proposed dinner at the Crystal Palace, it has also a utilitarian recommendation which may not be unimportant for the general interests of the trade.

It is an old saying, that to put an Englishman in a good temper the best plan is to give him a good dinner, and though, happily, we do not for a moment suppose the promoters of the dinner can have for an ulterior object the smoothing of any possible difficulties at the coming Annual Meeting of the Pharmaceutical Society on the following day, we know no better plan of eliminating asperities from projected orations than that of giving intending speakers and voters an opportunity of becoming better acquainted, and appreciating the motives by which each is swayed.

The list of stewards given on page 886 comprises names representing every shade of opinion and the fact that so many have readily come forward to aid in making the dinner a success may well be accepted as evidence that the differences of opinion occasionally manifested amongst the Pharmaceutical body have their origin in the earnest desire for the general welfare. We hope the anniversary dinner of the Society will not only be successful this year but that it may also become a permanent institution.

A writer in the *American Journal of Pharmacy* calls attention to the great advances that have been made in the art of disguising nauseous drugs, and attributes to a great extent the increase in the number of votaries of homœopathy to the skill with which homœopathic practitioners have availed themselves of the resources of "elegant pharmacy" in their medicinal preparations. Premising that much might be done by the united action of the allopathic practitioner and the pharmacist to produce medicines that should successfully compete with homœopathic remedies in simplicity, beauty and adaptability, he suggests the abnegation of secret formulæ, on the ground that what is advantageous for one should be for all, especially with regard to such things as remedies for suffering humanity. It is to be feared that while the love of the "almighty dollar" is so strong in both countries, stronger arguments will have to be used to accomplish the desired object.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

May 1st, 1872.

MR. A. F. HASELDEN, F.L.S., PRESIDENT, IN THE CHAIR.

MR. EDWARDS, VICE-PRESIDENT.

Present — Messrs. Atherton, Betty, Carr, Frazer, Greenish, Groves, Hills, Sandford, Savage, Shaw, Smith, Stoddart and Williams.

The minutes of the last meeting were read and confirmed.

Resolved—That the following, being duly registered as Pharmaceutical Chemists, be respectively granted a Diploma stamped with the seal of the Society:—

Dale, John .... Birmingham.
Hill, William Edward .... Leicester.
White, William Edwin ...... Dover.
Wilson, John Herbert .... Harrogate.
Wright, Thomas .... Leicester.

Resolved—That the following Pharmaceutical Chemists be, and are hereby, elected Members of the Society:—

Freeman, Ernest .... Ledbury.
Hill, William Edward .... Leicester.
Southwell, Charles Henry .... Boston.
Towerzey, Alexander .... Clifton.
Ward, Joseph .... Gloucester.
Wilson, John Herbert .... Harrogate.
Woolley, Harold .... Manchester.
Wright, Thomas .... Leicester.

Resolved—That the following registered Chemists and Druggists be elected to Membership:—

Alexander, John .... Liverpool.
Cornforth, Edwin .... Birmingham.
Chalmers, John .... Dundee.
Denston, John Thomas .... Kettering.
Evans, Edward .... Sheerness.
French, Benjamin .... Gosport.
Pitman, John .... Bristol.
Riddle, Joseph .... South Shields.
Rogers, Sampson .... Shaldon.
Salter, Joseph Birch .... Shrewsbury.
Shorrock, Ralph .... Over Darwen.
Stanley, Robert Swan .... Southwell.

Resolved—That the following, having passed their respective Examinations, be elected "Associates in business:"—

Minor.

Brewis, Thomas .... Amble.
Davison, John .... West Hartlepool.
Dolman, William .... Cheltenham.
Evans, Richard Morgan ...... Blaenavon.
McNeil, James Norton ...... Crewe.
Margetson, James Francis .... Coltishall.
Mountain, Robert .... Harrogate Wells.
Palmer, Francis .... Upper Norwood.
Robeson, Charles Brunting.... Southwark.
Stokes, Walter Edward ...... Brompton, Kent.
Wilkes, John Sanders ...... Leicester.
Williams, William Francis.... Chepstow.
Woolstencroft, Joseph .... Northwich.

Modified.

Chapman, Josiah Thomas .... Manchester.
Ellis, Alexander .... Skelton in Cleveland.
Field, Henry .... Aylesbury.
Gibson, Reuben Leonard...... Loughborough.
Graves, Joseph Waddington .. York.
Grimditch, William James .. Ely.
Highley, William .... Rochdale.
Morgan, Philip Henry .... Taunton.
Passingham, George William .. London.
Radclyffe, Robert Caygill Tom Birmingham.

Sloman, Richard ....Torquay.
Smith, Percy John ....Balham.
Spratt, George Uriah ....Nottingham.
Woodcock, Arthur ....Norwich.
Wynne, Edward Price........Aberystwith.

Resolved—That the following, having passed their respective Examinations, be elected Associates of the Society:—

Major.

Brough, Henry James........Windsor.

Minor.

Appleby, Edward Joseph ....Brighton.
Bates, William ....Stevenage.
Blackwell, Frederick William Birmingham.
Constance, Herbert Edward ..London.
Cortis, Arthur Brownhill ....Worthing.
Dear, James Edward ....St. John's Wood.
Edwards, Thomas............Newport, Monm.
Evison, William ....Louth.
Green, Vittery ....London.
Greenish, Thomas Edward....London.
Haworth, Benjamin Henry....Manchester.
Houghton, Robert William ..Bermuda.
John, Jabez Arundel ....Tenby.
Jones, Matthew Henry ......London.
Langham, Henry John ......Diss.
Latham, Robert John ....Worksop.
Maitland, Alick..............London.
Williams, William Griffith....Abergele.

Modified.

Cox, John James Wilson ....Brighton.
Griffits, John Alonza ....Wantage.
Johnson, Robert Armstrong ..Newcastle-on-Tyne.
Probyn, Clifford ....Kennington.
Shemmonds, John ....Coventry.
Watson, Charles ....London.

It was resolved—That the Report and recommendations of the Library, Museum and Laboratory Committee be received; and the following books recommended for the Library were ordered to be purchased:—

Lyell's Principles of Geology.
Merrifield's Technical Arithmetic and Mensuration.
Wood's Notes on Heat, etc.
Darwin's Origin of Species.
Smith's Pharmaceutical Guide.
Frankland's Lecture Notes—Organic Chemistry.
Humboldt's Cosmos.
M'Culloch's Dictionary of Commerce and Commercial Navigation.
Annuaire Pharmaceutique.

The Committee presented the Annual Report of the Council, which, with alterations, was agreed to, and ordered to be issued with the Voting Papers for the election ensuing of Council and Auditors.

Resolved—That the Report and recommendations of the House Commitee be received and adopted.

The Report of the Finance Committee was received and adopted, and sundry payments ordered.

Resolved—That the Report and recommendations of the Parliamentary Committee be received and adopted.

The Report of the Provincial Educational Committee was read. It recommended the expenditure of more money on provincial education, and stated that in the opinion of the Committee, the applications for aid would have been more numerous had the conditions been less stringent and less fettered by details. It therefore recommended certain amendments in the regulations.

Mr. Williams suggested the question whether the proposed alterations would really widen the sphere of provincial pharmaceutical education.

Mr. Atherton said they would no doubt do so to some extent, but in his opinion the whole matter would have to be gone into systematically and on a broader basis by the new Council. He therefore doubted the advisability of doing a thing partially which would have to be re-considered so soon.

The President thought the new Council would be assisted in this matter by the recommendations of the Committee being adopted.

Mr. Shaw thought it most important that something like the principle of "payment for results" should be inaugurated in connection with this matter. In the case of Liverpool there had not been such a demand for pharmaceutical education as might have been expected, and the facts showed the necessity of some regulations which would ensure the funds of the Society being wisely expended. For the last twenty years every desirable means had been provided in Liverpool for giving a thorough systematic pharmaceutical education, lectures on Botany, Materia Medica, and Chemistry being delivered, but although there must be from three to four hundred apprentices and assistants in the town, these lectures had not been attended by more than half a dozen, while the Materia Medica lectures were attended by *two* only.

Mr. Hills asked if the masters had given their young men the opportunity of attending.

Mr. Shaw said he was simply speaking of the facts, not entering in any way into the cause or causes. He had heard that in other places masters had insisted on the time spent by their apprentices in attending lectures, etc., being made up at the end of the term. Individually he was prepared to vote for any amount being expended on the advancement of provincial education and was very much pleased with the action of the Northampton Association as stated at the last meeting. He hoped that by degrees it would become generally known by parents and guardians, that under the regulations which required every chemist to pass his examination before entering into business, it would be essential that ten or twenty guineas should be expended on lectures, etc., at the conclusion of a young man's apprenticeship. He thought on the whole the matter had better be left to the incoming Council, and suggested that it would be well if the balance sheets of the various provincial Societies were forwarded, so as to show that all was fair, and above board, and that it might be known who had done their duty and who had not.

Mr. Stoddart said that his experience at Bristol was quite at variance with that of Mr. Shaw at Liverpool. The Bristol Association had made no application for assistance, though he had been asked several times to do so; but he had always said they had better do all they could for themselves first, and then if absolutely necessary they could ask for assistance, and he was sure the Society would grant it. He believed every druggist in Bristol had joined their Association, which had now been in operation for two seasons, and had been very prosperous indeed. Last year there were classes in Chemistry, Botany and Materia Medica, the number of students at the commencement being 18, and the same at the conclusion of the session. He found that two of the young men had since passed their minor examination, although the last lecture was only given in February. This showed they ought to be rather circumspect in this matter, and see that people tried their best to help themselves before asking assistance.

Mr. Shaw said that Liverpool had not applied for assistance. He asked if Mr. Stoddart had not virtually applied the system of payment for results, by requiring a fee of 5*s*. only for the lectures (which he gave gratuitously) if the students attended regularly, whilst 10*s*. was exacted if they did not.

Mr. Stoddart said the fee was uniformly one guinea, which was devoted to the formation of a museum of materia medica. The 5*s*. subscription to which Mr. Shaw had referred was requisite to constitute a young man a member of the association.

Mr. SAVAGE thought the suggestions of the Committee were very admirable, and really met Mr. Shaw's views.

The Report of the Committee was then adopted.

Mr. SANDFORD suggested that a special resolution should be passed, embodying the proposed alterations in the regulations.

Mr. ATHERTON thought it would be useless to do so, as the Council were so soon going out of office.

Mr. SANDFORD thought it would be, at any rate, taking a step in the right direction. He saw no reason why a given amount should not be voted to a provincial association, and left to be expended as necessary. The regulation hitherto acted upon had stood greatly in the way of assisting provincial education, though the principle of granting aid had been fully established—first by a resolution at General Meeting, and afterwards by repeated resolutions at the Council. He would, therefore, move that the alterations recommended by the Committee be made in the code of rules marked "No. 1."

Mr. GROVES suggested that the motion which Mr. Frazer brought forward at the last meeting should be incorporated, so that all applications should come before the Council together and be decided at the same time.

Mr. FRAZER said he was still of opinion that money for this purpose should be voted upon some general principle, and he knew of none except the state of the balance sheet. He thought Mr. Shaw's idea of payment for results was really met by the proposed regulations. He always thought it a mistake not to give any assistance towards lectures, which it appeared to him were equally worthy of encouragment with the collection of books and specimens.

Mr. WILLIAMS thought the course of the discussion showed how difficult the question was, and that it had really better be deferred. If they adopted the resolutions, they had no guarantee they would be acted upon in the future. As Mr. Atherton had remarked, it was a large question, and must be dealt with on some great principle, and he hoped this would be done by the new Council.

Mr. HILLS agreed that the question had not been gone into sufficiently yet; but this was a step in the right direction, and he would therefore accept it for the present. He believed London members would be very liberal in the matter. For his part, he would at any time give half as much as the local Society itself raised.

Mr. BETTY said it was from no want of desire on the part of the Committee to enter into the question on a broad basis that they did not go further in the regulations proposed. They were simply put forward, and the Committee wished them to be accepted as an earnest and evidence of the good feeling of the Council towards advancing pharmaceutical education in the provinces. They would willingly have gone a step further, but it would have been impossible to go into the whole question at present, because they could not complete the work. The broad question had not been lost sight of, though the Committee had not been able to come to a decision upon it. Several plans had been proposed, and one was mentioned which he believed would some day have to be adopted, viz., that schools should be established in so many provincial centres—say 12 or 14,—where pharmaceutical education should be given, similar to what was done in the case of the medical schools. He also agreed with Mr. Frazer's suggestion that the balance-sheet, showing what was done with the funds voted, should be presented annually. He had mentioned a sum of £600, to be divided into 12, which would give £50 to each, and that, he thought, should be granted for one or two years; and even at the expiration of that time assistance might be given according to the results of the teaching. The schools must be established first, and the results paid for afterwards.

The PRESIDENT thought Mr. Betty was going rather further than the Report before them warranted.

Mr. BETTY said he was only giving the reasons why the Committee were not able to go into the general subject, though they were very desirous of treating it in a comprehensive manner.

The resolution was then put and carried.

(In order that the alterations may be fully understood, the Regulations as amended are printed at page 893, *the alterations being in italics.*)

Resolved—That the Report of the Conversazione Committee be received and adopted.

Mr. SMITH then drew the attention of the Council to a circular which had been sent round with regard to the forthcoming election, headed "Pharmaceutical Society of Great Britain," and, therefore, purporting to emanate from that Society. It appeared to him a very important matter, and, as he thought, unless some immediate steps were taken it would have the effect of vitiating the whole election. He thought those who had put it forward had subjected themselves to legal penalties.

Mr. GROVES was of the same opinion. He had not seen it before.

Mr. SMITH said it was important to stop such a matter at once, for no one could say on what occasion a similar thing might be done next.

After some further discussion, in which several members took part, the matter was referred to the Parliamentary Committee, with instructions upon it as the solicitor should advise, to take such steps that a meeting of the Committee be called immediately.

Mr. CARR drew the attention of the Council to a letter in a recent number of the Journal, by Mr. Scholefield, regarding the investment on the Benevolent Fund account. He suggested that if the amount invested in consols were turned into Metropolitan three and-a-half per cents., there would be an increase of income of upwards of £40 per annum, with perfect security.

REPORTS OF THE BOARD OF EXAMINERS.

April, 1872.

ENGLAND AND WALES.

Examination.	Candidates examined.	Candidates passed.	Candidates failed.
Major	7	5	2
Minor	39	22	17
Preliminary	299	158	141
	345	185	160

PRELIMINARY.—Certificates received in lieu of this Examination:—

College of Preceptors	2
Society of Apothecaries	1
University of Cambridge	1
University of Oxford	1
	5

SCOTLAND.

Preliminary Examination.

Candidates examined.	Candidates passed.	Candidates failed.
48	27	21

Mr. CARR said as this was the last monthly meeting of that Council he begged leave to move a cordial vote of thanks to the President for the very able and courteous manner in which he had discharged the duties of his office during the past year.

Mr. SMITH seconded the motion, which was carried unanimously.

A similar vote of thanks was given to the Vice-President.

ERRATA.

In the Number for April 27th, page 873,

line	10	*for*	Kendal	1	1	1	*read*	Kendal	1	1	
,,	41	,,	Elgin	1			,,	Elgin	1		1
,,	42	,,	Glasgow	8	3	1	,,	Glasgow	8	3	5
,,	43	,,	Greenock	1	1	5	,,	Greenock	1	1	

STATEMENT OF ATTENDANCE OF MEMBERS OF COUNCIL ON COMMITTEES FOR THE YEAR 1871-72.

	Committees held once a Month or oftener.			Committees held occasionally.						
	Finance.	Publication of Council Minutes.	Library, Museum, and Laboratory.	House.	Benevolent Fund.	Parliamentary.	Provincial Education.	General.	Special Committees appointed to draw up Reports, etc.	Total Number of Attendances.
No. of Committee Meetings held.	13	12	13	11	9	17	6			
Atherton (*Nottingham*)	*	*	*	*	*	7	2	This Committee did not transact any Business during the Year.	2	11
Betty (*London*)	10	*	8	*	8	14	6		12	58
Bottle (*Dover*)	*	*	*	*	*	7	*		0	7
Brown (*Manchester*)	*	*	0	1	*	5	*		3	9
Carr (*London*)	10	*	*	*	7	2	0		0	19
Edwards (*Dartford*)	0	0	2	1	0	3	1		1	8
Frazer (*Glasgow*)	*	*	*	*	*	*	*		1	1
Greenish (*London*)	10	*	12	11	7	13	4		9	66
Groves (*Weymouth*)	*	*	*	*	*	*	1		5	6
Haselden (*London*)	3	12	12	5	3	11	2		17	65
Hills (*London*)	*	*	12	10	*	6	*		1	29
Mackay (*Edinburgh*)	*	*	*	*	*	*	1		2	3
Reynolds (*Leeds*)	*	*	*	*	*	4	2		3	9
Sandford (*London*)	*	11	6	6	*	8	1		8	40
Savage (*Brighton*)	*	*	*	*	*	4	*		0	4
Shaw (*Liverpool*)	*	*	*	*	*	7	3		1	11
Smith (*Torquay*)	*	*	*	*	*	*	*		0	0
Stoddart (*Bristol*)	*	*	0	0	*	*	1		0	1
Sutton (*Norwich*)	1	*	*	*	1	*	0		0	2
Williams (*London*)	*	*	13	10	*	16	6		10	55
Woolley (*Manchester*)	3	*	*	*	3	*	1		0	7

* Not appointed on this Committee.

STATEMENT OF ATTENDANCE OF MEMBERS OF COUNCIL AT COUNCIL MEETINGS FOR THE YEAR 1871-72.

Atherton, John Henry	14	Greenish, Thomas B.	13	Savage, William Dawson	12
Betty, Samuel Chapman	15	Groves, Thomas B.	12	Shaw, John	12
Bottle, Alexander	12	Haselden, Adolphus F.	15	Smith, Edward	11
Brown, William Scott	7	Hills, Thomas Hyde	15	Stoddart, William Walter	9
Carr, John	14	Mackay, John	4	Sutton, Francis	8
Edwards, George	10	Reynolds Richard	5	Williams, John	14
Frazer, Daniel	7	Sandford, George Webb	12	Woolley, George Stephen	8

Conditions for Making ard Receiving Grants and Loans in Aid of Provincial Schools of Pharmacy.

The alterations now agreed on by the Council are printed in italics.

1. Grants in aid of Provincial Education in Pharmacy shall be made for the *special* purposes of supplying materials for class-teaching, such as apparatus, specimens, diagrams, chemicals, class-books, etc., and also towards the formation of libraries, *or for the general purposes of advancing education where satisfactory evidence is given that the Association from which the application proceeds is really promoting that object and needs assistance.*

2. That application for such grants be made in writing to the Council on forms provided for the purpose, by local Associations of Chemists and Druggists, signed by the Secretary of the Association and by three resident Members of the Pharmaceutical Society.

3. That each application shall state the kind *and amount* of aid required.

The following portion of the original clause to be omitted, [and, where a money grant is applied for, shall indicate the sum intended to be applied to each specific purpose.]

4. That where a grant is made for the purpose of providing *materials for class teaching*, etc., the applicants *shall guarantee* their safe custody for a period of three years. The said materials to be *the loaned property of the Pharmaceutical Society for three years*, after the expiration of which they may be resumed by it, or otherwise disposed of. The Council may, in special cases, forego this guarantee where it deems it not desirable.

5. Applications for the use of apparatus from the "*loan collection*" of the Society may be made by local Associations of Chemists and Druggists, and grants made for periods of fourteen days, in accordance with the following rules:—

1. A list of the apparatus which the Society is prepared to lend, or which may be hereafter added to the collection, shall be published in the Journal, and printed for circulation in a separate form. Such lists may be obtained from the Secretary of the Pharmaceutical Society.

2. The apparatus shall only be lent to Associations of Chemists and Druggists, and applications for the loan thereof must be made in writing, on forms provided for the purpose, signed by the Secretary of the local Association, describing the articles required, and directed to the Secretary of the Pharmaceutical Society.

3. The Secretary of the Pharmaceutical Society shall refer any application so received to Dr. Redwood, who, with the assistance of the Curator, shall supply the same, subject to approval of the President or the Vice-President of the Society, and to the following conditions:—

A. No apparatus shall be lent for a longer period than fourteen days, unless a renewed application is made for it.

B. All apparatus so lent shall be at the risk of the borrowers, who shall defray the cost of any damage that may occur to it.

C. Packing cases and packing will be provided and paid for by the Pharmaceutical Society; but cost of carriage must be paid for by the borrowers.

D. A list of the apparatus lent to local Associations shall be sent to the Secretary applying for it, who shall sign and return it as a receipt for the apparatus when received.

6. Applications for aid to Libraries must be accompanied by particulars of the number of volumes already contained in such library, and the name of each book applied for, and its price specified.

7. The relative claim of any town to receive aid from the Society must be indicated by the earnestness and efficiency of local effort. A complete curriculum of chemistry, practical chemistry, materia medica, pharmacy and botany is the standard to be aimed at.

8. All applications to the Council for aid may be referred to a standing Committee appointed annually for this purpose. The recommendations of the Committee to be laid before the Council for action thereon.

To the Council of the Pharmaceutical Society of Great Britain.

Form of Application for Grants in Aid of Provincial Schools of Pharmacy.

Name and Address of Association applying for Grant . } ______________________

(In the following Divisions state the object or objects for which the Grant is required, and the amount it is desired to appropriate to any or each of the following purposes)—

A For providing apparatus, specimens, diagrams, etc. Specify the articles required, and the amount of grant requested . . } ______________________

B For providing books, etc. for library. State the particulars of the number of books already in the library of the Association, the titles and prices of the books it is now desired to purchase, and the amount of grant requested . . . . . } ______________________

C For any other object. State the purpose for which the grant is required, and the amount requested . . . . . } ______________________

D *For the general purposes of Pharmaceutical Education, give the balance-sheet of the Association for the preceding year, and the number of students availing themselves of the opportunities offered. Also state the reason for requiring aid from the Pharmaceutical Society* . . . . } ______________________

As the relative claim of any town to receive aid from the Society must be indicated by the earnestness and efficiency of local effort, state here any consideration which, in the opinion of the applicants, entitles them to a grant from the Society's funds . . . . } ______________________

(Signed) *Name* ______________________

Address ______________________

Secretary of the above Association.

Three resident members of the Pharmaceutical Society.	*Name* ______________
	Address ______________
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Dated ______________

PHARMACEUTICAL MEETING.

Wednesday, May 1st, 1872.

MR. A. F. HASELDEN, F.L.S., PRESIDENT, IN THE CHAIR.

The following donations to the Library and Museum were announced, and the thanks of the Society were voted to the donors:—

Durham University Calendar: from the University,—Minutes of the Convention of Pharmaceutists and Druggists, 1851; Proceedings of the National Pharmaceutical Convention, 1852; Proceedings of the American Pharmaceutical Association, 1855, 1867, and 1871: from the American Pharmaceutical Association,—Bark of *Memecylon grandis*, the Ki-temboga or copper tree, of Java, from Ceylon; Bark of *Cerbera Odallam* of Ceylon; Essential Oil of *Chavica* (*Piper*) *betle;* Essential Oil of *Gaultheria punctata:* all presented by Dr. J. E. De Vrij,—Oil of *Eucalyptus globulus;* Oil of the pericarp of the Cashew-nut; Oil of Cashew, from the kernel; Eucalyptol, from *Eucalyptus globulus:* presented by Mr. G. Brownen,—Specimen of Crude Chloride of Potash, as imported from Saxony: presented by Messrs. Hodgkinson, Stead and Treacher, —A very fine specimen of one of the Vertebral Bones of the Whale: presented by Messrs. Hopkin and Williams.

Professor BENTLEY made some observations on the donations of Dr. De Vrij. He said he had understood that the bark of *Memecylon grandis* had been sent partly for analysis and partly because Dr. De Vrij had found it useful as an astringent. He thought it was very likely that it was so, because it belonged to a Natural Order, *Melastomaceæ*, many of the plants of which have a slight astringency. If there were any particular value to be derived from it, that would be shown when we get more particular information in connection with it. It was always a matter of great interest that such men as Dr. De Vrij should bring us specimens from different districts, because that was the only way to introduce new remedies into this country.

Mr. COLLINS said that the specimen of *Gaultheria punctata* was in illustration of Dr. De Vrij's article in the Journal. With regard to the bark of *Memecylon grandis*, Dr. De Vrij thought it might also be used in tanning. The native name, Ki-temboga, is given on account of the very characteristic copper colour of the bark.

Dr. TILDEN said that at the last meeting there was laid upon the table a specimen labelled "bisulphite of magnesia," and since then a paper had been written by Mr. Archbold, in which an account was given of the properties and composition of the salt, as well as details of its analysis. Dr. Tilden's attention had been directed to the subject, partly in consequence of the improbability, already pointed out by Mr. Carteighe, of the existence of such a compound, and partly, by what seemed to him, the singular and incoherent style in which the paper was written. He was always happy to welcome any new worker in the field of science, but he thought Mr. Archbold was not very familiar with the kind of investigation he had undertaken. Dr. Tilden had analysed the specimen which had been presented to the museum, and found it was no "bisulphite," but simply the ordinary sulphite of magnesia, containing six molecules of water of crystallization, and which would be found described in many of the text books. The formula given by Mr. Archbold was an impossible formula. That a solution of an acid sulphite of magnesium might exist, and that in certain cases it might be a useful remedy, he did not dispute, but the specimen before the meeting was certainly incorrectly named, and he thought it highly improbable that any such compound could be produced in the solid form.

Mr. WILLIAMS said that he had no special knowledge of bisulphite of magnesium in the crystallized form, and thought it would probably be very difficult to produce; with respect to the soluble bisulphites, especially those of potash and soda, the following test could be employed, to determine if they were bisulphites or simply sulphites,—it depended upon the fact that bisulphite of lime was soluble in water. A solution of chloride of calcium added to a solution of the bisulphite to be tested will produce no precipitate if the salt is perfect, but if a precipitate be produced (it may be sulphite or carbonate) the whole should be thrown on a filter, and the filtrate precipitated by lime-water, by which means the excess of sulphurous acid would be neutralized, and from the amount of sulphite thus produced, the percentage of bisulphite originally present in the sample could be easily calculated.

PHARMACY IN AUSTRIA.

[Mr. GREENISH then read a paper on "Pharmacy in Austria," which is printed at p. 881, and gave rise to the following discussion.]

Mr. BETTY said they ought to be very much obliged to Mr. Greenish for the very exhaustive and practical essay which he had written. He had, in common with every pharmacist, been very much pleased with the contrast existing between the practice of pharmacy in England and on the Continent. He thought it ought to act as a warning to English pharmacists, and lead them to watch very zealously, lest the independence which attaches to the national institutions and the spirit of an Englishman should be in any way compromised or destroyed by that petty and over-legislation which so prevailed in foreign States. He hoped the Government of this country would never be afforded any pretext for commencing it. It was too often thought that the making up of a prescription was a mere mechanical action requiring no skill, and especially was this the case in foreign countries, as was shown by the amount paid for the skill in making up a prescription in Austria. In the instance given by Mr. Greenish, two-thirds of the price was paid for the mechanical operation of dividing the powders and for the box and gold label. He was glad to see that German pharmacists were trying hard to get rid of that over-legislation which had proved so irksome to them.

Mr. GROVES said that, although it appeared that in Germany pharmacists were harassed by unnecessary legislation, nevertheless, on the whole, benefit resulted to them from it. One thing he observed was that all young men who entered their names were required to pass a preliminary examination in arts. He thought that would be about the best thing that could happen in this country. It was highly absurd that a pharmacist here was compelled to undertake certain examinations before he could open a shop and conduct a business, and yet immediately after that he might engage any one he liked for his subordinate, and pay him as little as he liked. He thought that in this the public health and safety were not considered, and that no one ought to be engaged who was not thoroughly qualified. Referring to the remark of Mr. Greenish, that the young men in Austria had two hours a day to themselves, he said that he thought every master ought to allow that amount of time, and also afford access to a laboratory and other apparatus. He could not help remarking the prevalence of the objection of pharmacists to laboratories. He much regretted it, and hoped that more would be established. He had himself conducted one for many years, and he intended to bring the subject forward in the Journal, and endeavour to show how one might be carried on at very small expense, and with very great profit.

The PRESIDENT said he should like to ask Mr. Greenish what time the apprentices commenced work, and at what time they ceased their ordinary labours; and what was the time of the day they got for study; and how many hours they were allowed for meals? for he thought that when they had been informed on these matters, probably young men present would be better satisfied with their position than they were now.

Mr. GREENISH said the assistants went to business very early indeed, usually about six o'clock, and the shops were kept open to a late hour. But the apprentices had generally two hours every evening for study, and the assistants two half-days every week for recreation. The apprentices and assistants were a greater number of hours in business than in this country. A pharmacist mentioned to him that though the apprentices had two hours given them every evening, there was the greatest difficulty in keeping them at study, for they would go to the *cafés*.

Mr. WILLIAMS said he could not say anything about the practice of pharmacy in Vienna, but he had seen something of it in the more country parts—in the Tyrol. His impression was that the pharmacists were in anything but an enviable position, especially compared with us here, and no one would wish to change places; and that was amply proved by the scale of charges allowed for a prescription. It could not be a very remunerative business, even where money goes a great way. As far as he could judge, they seemed to be in a very unsatisfactory position indeed. There appeared to be two classes of society, and only two—the nobility and gentry and the peasantry, and no intermediate class; and the chemists were really drawn from the lower class, and they were allowed to get a miserable living, and that was all. He might be wrong, for he could gather but little information except by what he saw, but such was his impression, and he thought their position was not at all of an enviable character.

Mr. HILLS said he could endorse what Mr. Williams had said, that English pharmacists are in an enviable position compared with pharmacists in other parts of the world. He would not deny that the hours were very long, but they had been much longer. In his time they had been very much curtailed, and they were still being curtailed, and it was to his younger friends that they all looked to uphold pharmacy in England. They must remember this: in pharmacy the position a man occupied would depend very much upon himself, whether he was an apprentice behind the counter or a shopman; a man could take almost any position he liked if he displayed intelligence and courtesy and gentlemanly conduct. It must not be forgotten that lately two or three of their body had received the honour of knighthood; but he would not be satisfied with that, for he hoped to see some of them baronets, and perhaps rise even higher still. It was to the students of the present day that he looked to place pharmacy in the position it ought to be. He thought he might be permitted to say that he believed he was the first associate of this Society, and when he first commenced, students had nothing like the privileges they have now. When he came to Oxford Street they only had one or two books, such as Thomson's 'Dispensatory,' Turner's 'Chemistry,' Hooper's 'Dictionary,' and Thomas's 'Practice of Physic.' At that time, with the help of Mr. Mackay, of Edinburgh, they formed a class among themselves, and they used to get what information they could during their meals and after nine or ten o'clock, after which time their class was held. If they had gone through all that, and yet pharmacy had attained its high position, he would tell his young friends present what they expected of them. Having gone so far themselves, now they expected a great deal more from those who were coming on the stage. Of course, in thus assisting in the progress of pharmacy in England, they had benefited themselves. It was for the present students to persevere, to work hard; and in working hard, they might depend upon it, success would crown their efforts, and they would find it to be the happiest time in their lives. When they were at work, let them work with all their might.

Mr. GREENISH said he endorsed Mr. Williams's remarks as regards pharmacy in the Tyrol, but he thought they would not apply to Austria generally. There the pharmacists were well off. The limitation of pharmacies on the Continent is such that a business becomes valuable; much more is paid for it because of this Government concession. There can be no opposition. A pharmacy returning a thousand a year would fetch several thousands of pounds there. There is a society now established in Berlin trying very hard to get freedom of trade. As regards social position, the pharmacist is a gentleman and can mix in any society.

Mr. WILLIAMS suggested that he had a private income as well.

Mr. GREENISH said he was not sure of that. But he must have been able to put his hand upon a good sum of money in order to have bought the pharmacy.

Mr. BETTY asked if any reasons could be given for the Government limiting the number of apothecaries' shops?

Mr. GREENISH replied that the great reason why the limitation was not done away with was because it was a Government concession; and if it were abolished and there were freedom of trade they would have to make compensation, which would involve the payment of an enormous sum of money. He also said that it was the feeling of a large number of people, many of whom, however, were out of business, that this over-legislation was very injurious to the interests of pharmacy generally, and he believed it was himself.

The PRESIDENT said he could well understand the comfortable position of pharmacists in Austria, from the fact of the number being so limited. He had no doubt if half the pharmacists in this country would emigrate or go to another world it would be a capital thing for those left behind. But when he looked at the scale of charges there for what we called skilled labour, he felt sure that our assistants would be greatly dissatisfied with that proportion of pay. One sentence in the paper he could not help smiling at, and that was that the master had to see that the intended apprentice wrote fluently and plainly. This was particularly necessary to prevent the patient being mislead. He remembered on the last occasion it was said that very often the medicine was given to the person who came for it wrapped up carelessly and not sealed, so that frequently, if it happened to be a wet day, by the time the messenger reached home it was impossible to tell what was written upon the label.

Mr. GROVES said that these men enjoyed tolerable incomes, notwithstanding the lowness of price; and he thought their position after all was to be envied.

Mr. HILLS said he could not agree with Mr. Groves that the pharmacists did not take a position in this country. He believed it was entirely their own fault if they did not. He did not care whether a man was in the shop or where he might be, if he conducted himself properly and straightforwardly, and showed intelligence and a love of his profession, he always took a position. It was true he might not get into the House of Lords; but, as his friend near him suggested, he could go into the House of Commons. He thought it was altogether a mistake to decry the position of pharmacy.

Mr. GROVES said that living in the country as he did he found that, with a certain class of people, it was customary to look down on pharmacists, though he admitted it was not so with others, and mentioned an amusing instance that had occurred in his own experience.

Mr. Betty, referring to the position of the future pharmacist, said that, in his opinion, very much would depend upon the education he received. If a sound preliminary education were secured, and this followed up by earnest and persevering study, he believed pharmacists might lay claim successfully to a very high position in society.

Mr. Walter Hills said that as to the position chemists took in Germany, it ought not to be forgotten that most of them made chemistry, botany, or some other scientific pursuit their particular hobby, and devoted themselves wholly to it, and this gave them a certain position; and being always at scientific meetings, and so forth, they mixed in the highest intellectual society, and thus were able to hold their own against everybody. As regards the position of assistants abroad, he thought they were not at all in an enviable position. In France, as far as he could judge, they were very badly off indeed. He thought that an English chemist in a pharmacy in Paris would get about double the salary that a man would get in one of the French pharmacies. It ought also to be remembered that Sundays abroad are much less free than they are in England. Most assistants here get at least one Sunday in two. The long hours, small pay, and bad lodgings provided in many cases, made their position a very unenviable one.

Mr. Greenish said he could confirm what the last speaker had said as to pharmacists abroad taking some particular subject, and instanced several men who had devoted special attention to different branches of the science.

The President said that the subject was now closed; but he would like to make one observation. According to the original proposition, it was intended to have another meeting on the 5th of June, but it had been suggested that it would be advancing rather too far into the summer, and, therefore, unless some special notice was given to the contrary, there would be no further meeting this season until October next.

A vote of thanks was then proposed by Mr. Williams, and carried with acclamation, to the President for his courtesy and kindness, and the ability with which he had presided at the evening meetings of the Society.

A vote of thanks was also given to Mr. Greenish for his able and interesting paper.

Provincial Transactions.

TYNESIDE CHEMISTS' ASSISTANTS' ASSOCIATION.

The First Annual Meeting of this Association was held on March 20th, at its rooms, Royal Arcade, Newcastle; the President, Mr. Shaw, in the chair.

On rising, he reviewed at some length the benefit to be derived from such an association as their own. Besides the association being a source of improvement, it had also been the means of creating a more friendly feeling amongst the assistants and apprentices of Tyneside than had ever before existed. He felt happy that they had been so successful during this their first session, as the Secretary's report would show.

He then called upon Mr. Alfred Brady, the Secretary, to read his report:—

"A Meeting of Chemists' Assistants and Apprentices was called September 5th, 1871, to consider the desirability of forming an association, which ended in a Society being formed, and committee, etc., elected.

"On Thursday, September 21st, Mr. Shaw (the President) read the inaugural address in the Museum of the Natural History Society, after which the Secretary read a paper on Alchemy.

"On Thursday, October 5th, the first of the ordinary meetings was held in the rooms now held by the club, at which Mr. Melhuish read a paper upon the various Sennas of Commerce.

"Since then papers have been read on the following subjects:—

"Tobacco, by Mr. Anderson; Cell-formation, by Mr. Heslop; Opium, by Mr. Shaw; Gum Acacia, by Mr. Greenwell; Specific Gravities, by Mr. Brady; Chlorine, Bromine, etc., by Mr. Pittuck; Iron, by Mr. Charlton; Dispensing, by Mr. Welch; Mercury, by Mr. Marshall; Solution, by Mr. Spence; Water, by Mr. B. S. Proctor, (a lecture); Cod Liver Oil, by Mr. Foggon; Cinchona Barks, by Mr. Owen; Oxygen, by Mr. G. Proctor; Iron, by Mr. J. Aslin, (a lecture); Opium, by Mr. Shaw, (2nd paper.)

"The average number attending the above meetings was 23½.

"It seems to me needless to go into the various grievances that have been discussed at various times; all have, I think, been fairly settled, and the Society is now in full working order.

"The number of members now is altogether about 60.

"We have had, besides donations in the form of cash, the following articles presented to the Society:—

"A Materia Medica Cabinet, by Messrs. Crozier and Smith; do. do., by Messrs. Evans, Sons, and Co.; do. do., by Messrs. Southall, Son and Dymond; a handsome set of materia medica specimens, by Messrs. Hodgkinson and Co.; a case of various tobaccos, by Mr. Jones; a large number of specimen jars, by the York Glass Company; do. do., by Mr. Mather; do. do., bottles, by Messrs. Maw and Co.; a number of shelves, by Mr. J. Swan; the Pharmaceutical Journal weekly, from the Society; 'the Chemist and Druggist,' by Mr. B. S. Proctor; do., by Mr. Welch; set of labels and map, by Mr. Barber; a ballot-box, by Mr. Simpson. Besides the things above mentioned, a considerable number of books have been lent. So that altogether we have not come off very badly and have, if work is meant, ample means for any student to pursue his studies."

The report was unanimously received by the members. The treasurer's report was then read, which showed a balance of £10. 1s. 3d. in favour of the Society. On the motion of Mr. Shaw, seconded by Mr. Charlons the report was received.

The election of officers for the ensuing session then took place. There were nominated for the presidency Mr. W. Shaw and Mr. Alfred Brady.

Mr. Shaw declined to take office again on account of pressing business engagements, thereupon Mr. Brady was elected unanimously.

There being no opposition, the following gentlemen were elected to the various offices.

Vice-President, Mr. Simpson; *Secretary*, Mr. G. H. Proctor; *Treasurer*, Mr. G. T. Marshall; *Committee*, Messrs. Shaw, Bullus, Owen, Heslop and Welch.

This concluded the business of the evening. The meeting then adjourned.

At the meeting on April 25th, the minutes of the last meeting having been read and adopted, the President elect delivered his opening address, which was as follows:—

Gentlemen,—Before thanking you for the honour you have conferred upon me in making me your President, it may be well for me to take a retro as well as a prospective glance at our general proceedings. Our late President, Mr. Shaw, told us in his opening address that one of his reasons for wishing to form an association here was that he, as things then stood, knew no one out of his own shop who was connected with the trade, and with whom he could associate or spend the evenings after the business of the day was concluded. This object has, I think, been to a great extent obtained, inasmuch as a large number of young men from the different establishments in the town have met together for the sake of social intercourse,—some to read, some to examine and talk over the numerous specimens in our collections, and others to enjoy a quiet pipe or game of chess. But this is not the only thing that came before the minds of those chiefly concerned in commencing our club. The primary object was to give our younger members all the advantages possible, to enable them to get up knowledge sufficient to pass the now compulsory examinations of the Pharmaceutical Society. Few indeed are the chances that an apprentice, say in a small shop in an out-of-the-way part of the town, has, especially where the premises are not closed till eight or even nine o'clock—few I say are the chances for such an one to pass his examination with any credit. He goes home, or to his lodgings, as the case may be, tired and too sleepy to do any good work. Now, if he chose, he can come here, have a quiet hour with little or no interruption, and, as a rule, can have any question answered or theory explained, and go away having passed a comparatively satisfactory evening; and by the time he arrives at his journey's end he will feel refreshed, and look forward with pleasure to the next day's duties.

At our meetings which have been held on Thursday evenings, and which are devoted to the reading and discussion of papers, we have had a fair diversity of subjects. I should like to see more of our younger members come forward in these; for depend upon it there is nothing which fixes a subject so well on the mind as reading that subject up with the purpose of writing an essay upon it for the benefit of others. And you may take it for granted that no paper you can read, if it has taken any reasonable amount of time and care to prepare, can pass without giving some instruction to all its hearers. I should like to see more members come forward with lectures, such as Mr. Heslop delivered at the commencement of the session, for, though his was really an essay on the cell-formation of plants, it was a subject on which little or no discussion could follow, as what he stated were facts not to be argued, but taken as such. We are, I think, exceedingly fortunate in having a friend like Mr. B. S. Proctor, who is able and willing to lecture to us, as he has shown, and who takes such interest in all that concerns the good of the association. Our thanks can do little to repay him for time and trouble he has taken on our behalf, but we can by following profit by his advice, and endeavour to show him that we are gratified for the pains he has taken.

With regard to the classes formed in the latter portion of last half year, we made one mistake, in having too many of them. It was not to be expected that any members could possibly attend them all; if, instead of four, two were commenced per week, as well as the ordinary meeting held on Thursdays, there would, I think, be a chance of a fair attendance at every one. You must see that it is not right to expect a man to spend the time necessary to get up a lecture on any subject, more especially a series of such lectures, and to get together the specimens required for them, if after all, only two or three gentlemen come to hear him. For my part, I would rather have eight or nine really attentive students than twenty who did not seem to care about the information they received. But, where are the eight or nine? I have heard more than once of the class not being held, because only one or two came to it. Now, if these classes are to be a success, there must be more attenders; and I cannot help thinking that there must be a large number of assistants in the various chemists' shops in Newcastle and Gateshead who would, if they only knew it, derive a good deal of profit by attending such classes. I do not expect that it would be much good to start them again until the summer is over; but when winter evenings commence, that is at the beginning of next session, I hope we shall be able to set to work again with renewed vigour. But, though we may not have any lectures on botany, you must not forget that it is in the summer that the plants are to be collected for use and study. I would recommend every one to take every chance he has to gather and preserve by pressing every sort of wild flower he can lay hands on—I said flower, but I did not mean only the flower. The botanist takes stem, leaves, and as much root as is convenient or possible to obtain. I would not have him simply keep medicinal plants, though they always make a large and interesting collection, as there are numberless herbs growing in our hedges which, though they do not enter into our Pharmacopœia, yet have, in times gone by, been used in medicine, and many that are still used, though seldom.

All that a botanist requires is a tin case or vasculum, and a pair of boards with two good strong straps, and a few folds of blotting-paper; with these he is fully equipped for his work. Many a time when I have been taking a holiday have I longed for the pressing-boards which I had thought too much trouble to take when leaving home.

They are really of very little bother, and few things are more annoying than to find a plant which you do not know, and wish to preserve, without having the means at hand.

Having said so much with regard to the necessaries for pursuing the study of botany, it is only needful to say that, having got your plant, the first question is to find out by general characters the Natural Order to which it belongs, and after that its more minute or specific characters, to arrive at the determination of the species; it may seem difficult at first, but really a very superficial knowledge of the Natural Orders is enough to distinguish them. Many of them, such as Umbelliferæ, Compositæ and Cruciferæ, are told at a glance.

Mind, let not what I have just said as to superficial knowledge lead you to think that I consider that sufficient; the temptation to be content with surface-work is naturally too strong when certain examinations are prominently in view. No one can suppose that any permanent good can be derived from such study, or does he intentionally lay himself out for such a course of smattering. Intentions are always good at starting. A new broom sweeps clean; but it requires determined and sustained effort to resist the compromises between inclination and duty, which so soon present themselves. The enthusiasm and excitement attending a change of occupation will carry most young men through the first stage of student life, without much drain on the store of these good resolutions; but there then comes a period when the drudgery of learning seems far to outweigh the fruits of knowledge obtained, and then it is that those who began with fair promise seem to fall away. But then the force of habit, together with a natural curiosity and gradual acquirement of knowledge, engenders an increasing thirst for more. It is then that temptation is strongest to be content with superficial study, when the attendance at classes or lectures is apt to become a formal thing, accepted as a task, in the hope that just sufficient knowledge can be obtained for examination purposes. The listless attendance of lectures can be of no real value. It is a mistake to suppose that the most gifted professor can teach you except by showing you the way to learn, and placing before you faculties to be worked out by your own industry. The right acquirement of knowledge is an individual work that no man can perform for you. The condition in which the drudgery of the onset becomes a labour of love is attainable by any of you, and until it is obtained, scientific progress is hard and uncertain. By ardent study, sticking closely to it, you will soon derive a pleasure from it not to be obtained in any other way. Ever remembering the injunction of King Solomon, "Whatsoever thy hand findeth to do, do it with all thy might." To conclude, gentlemen, I sincerely and heartily thank you for the honour you have done me in placing me in the high station of President of this Association, and I trust that I shall never cease to regard this Association with increasing interest. We may at some future period have a North of England branch of the Pharmaceutical Society, and who knows but what we may be the original cause of such a proceeding. We are, through the help of our hard-working and indefatigable Secretary, Mr. George Proctor, I believe increasing our numbers, and if you will all join and work hand-in-hand, I feel certain we shall rise quickly to the position of one of the best—I mean most useful and well-working-Associations, in the kingdom.

NORWICH CHEMISTS' ASSISTANTS ASSOCIATION.

On Friday, 12th ult., the Winter Session of the above Association terminated, and with it, the weekly classes, with the exception of that for the Preliminary Examination, which will be continued until July next.

In spite of the offer of prizes at the beginning of the session, the attendance has been very limited; the few students, however, who have been regular have worked well, and, it is hoped, will show to advantage in the examinations which will be held.

Three prizes of books are to be awarded to those who obtain the highest number of marks in a *vivâ voce* examination on those subjects taught by the Association; the fourth, given by the Vice-President, for the best written answers to a chemistry paper.

For this last, Professor Attfield has kindly consented to award marks.

Lately the Council have largely increased the library, consequently there has been a much more extensive circulation than heretofore.

The museum has also been increased, principally by donations from some of the leading London wholesale firms.

GLASGOW CHEMISTS AND DRUGGISTS' ASSOCIATION.

The Annual Business Meeting of this Association was held in the West Hall, Anderson's University, on the evening of Wednesday, 24th April last; Mr. Thomas Davison, President, presiding. There was a large attendance of members. The minutes of the last meeting having been read by the Secretary and approved of, Mr. J. J. Weir brought forward the motion of which he had given previous notice, anent the present unnecessary Sunday traffic. He supported his motion by a lengthened address; and after a good deal of discussion for and against, in which Messrs. Kinninmont, John Black, Brodie, Fairlie, the President, and others took part, the following motion was unanimously agreed to:—

"That this association views with sincere regret the widespread traffic in unnecessary articles on Sundays; and, having the honour and good of our profession at heart, we resolve to appoint a committee to draw up circulars, first, requesting employers connected with the drug business to discountenance the sale of such articles which do not necessarily come within the province of medicines; second, an address to the public, in the form of a card which could be placed prominently in the shop, where the attention of customers might be drawn to it, and thus induce them to desist from inquiring for such articles; and, third, to the various ministers throughout the city, asking their assistance, and that of their congregations, to curtail or put a stop altogether to the unnecessary traffic. Messrs. Davison, Kinninmont, and Weir to be the committee."

The Secretary, Mr. Fairlie, was then called upon, and read, as follows, the

Annual Report for Session 1871-2.

"The continued prosperity of your association is a great cause for congratulation. Many societies such as yours, long before they reach the age of your association, pine away and die through ill-health; but yours has gone on from strength unto strength, always growing in usefulness and influence as it grew in years.

"Session 1871-2 has been no exception. The membership consists of 38 employers, 50 assistants, and six apprentices, numbering 94 in all,—a smaller number, no doubt, than that of the year immediately preceding, but the new meeting-place being somewhat of a novelty last year, together with the small subscription, accounted in some degree for the great accession to the number of members last session. This year, however, that novelty has worn off, while the increased subscription, we are sorry to say, has prevented many from joining us, while some of those have found the attractions of the Assistants' Association and the agitation for early closing more in accordance with their wishes. We are convinced the late hour of meeting also prevents many from becoming members, and we earnestly hope that arrangements may be made next session which will enable us to meet at least an hour earlier than hitherto.

"The proceedings throughout the session just closed have been carried on with the usual spirit, the chief features being the opening address by Mr. E. C. C. Stanford, of the British Seaweed Company, and the address on 'Indian Poisons.' by Professor P. A. Simpson. The Association has also been indebted to Mr. M. H. Cochrane, F.C.S., Demonstrator in Anderson's University, for two very practical papers which were beautifully illustrated. To these gentlemen your Council would again tender their most sincere thanks.

"The other papers by members were more numerous this session than formerly; and several of these having found their way into some of the trade journals, proves, to some extent at least, that they were of no mean order.

"The discussions held throughout the year, though not so animated as in some previous years, were well sustained by the members generally, and were both interesting and instructive.

"The annual festival, which took the form of a supper this year, was quite a success in every way.

"The pharmaceutical botany class, conducted by Mr. Hennedy, and the chemistry class by Dr. Moffat, have been comparatively well attended throughout the year, but the experience of your Council in regard to these special classes has brought them to the conclusion, first, that a single course of lectures given once a week is not sufficient to prepare students for the various examinations to be passed in connection with pharmacy; and second, that in a city like Glasgow, where so many educational advantages exist at such reasonable terms, they are not altogether necessary.

"The late hours in many of the establishments throughout the city, is a very great hinderment to students taking advantage of these cheap evening classes; but your Council would recommend that all students should make such arrangements with their employers which would enable them to take advantage either of the morning or evening classes in the Andersonian University. It may be well to mention that the usual matriculation fee is not charged to pharmaceutical students, and it might be a recommendation for the Council elect to ascertain if students in pharmacy could not be allowed to attend the Andersonian classes on more advantageous terms even than the regular students. Our main grounds for this conclusion is the fact that only 18 members came forward this session to Dr. Moffat's chemistry class, and that a loss was incurred of about £6 to the Association; those who did take advantage of it, however, have derived considerable benefit, though, as stated above, the term was too short for all practical purposes. These and other reasons have prevented your Council from entering into any new arrangements for special classes.

"The number of failures in connection with some of the examinations of the Pharmaceutical Society has attracted considerable attention of late, more especially with regard to apprenticeship and provincial education; and we are glad to observe that the Council in London, principally through the exertions of Mr. Frazer, the Glasgow representative, have decided to reconsider the mode of giving aid to provincial associations. And your Council hope that before another year, some such proposal as that suggested by Mr. Frazer will be agreed upon, and that in future those societies throughout the country, such as yours, requiring aid, will have something tangible to look forward to each year, and not, as at present, an isolated and paltry sum which, hitherto, your Association has considered not worth asking for. It is certain, at all events, that provincial associations can do but little of themselves without the prospect of regular help from the Pharmaceutical Society, a body which at present is drawing very large sums from the very class who require their help.

"The question of prices, we observe, has again come up for consideration, and your Council express the hope that Glasgow, which has for so long been behind other towns in this respect, will soon be on a level with its compeers. A better opportunity certainly could not present itself than the present, when not only tradesmen of all grades are getting higher wages and shorter hours, but the present high price of many drugs and chemicals demand that something shall be done to remedy the anomalous state of things which has existed so long among us.

"Your Council are glad to record that the early-closing movement has at last resulted in something fruitful; and we earnestly hope that those still adhering to the late hours will be induced this summer to adopt the eight o'clock movement also. We would not be wanting in our duty, however, if we did not acknowledge that the present reduction of the hours, on the south side of the river especially, has been stimulated to a very great extent by the exertions of the Assistants' Association, a society which has sprung into existence chiefly for this purpose, though, we believe, they intend, after securing the short hours, to remain organized for mutual improvement. Your Council look upon this step of the young men as very promising for the future body of pharmacists. It is to hoped, however, that they will not only acknowledge gratefully what has already been done for them by this Association, but will go hand in hand with them in endeavouring to advance the educational status of the trade.

"Your Secretary has received regularly as published, the PHARMACEUTICAL JOURNAL, *Chicago Pharmacist*, and *Chemists and Druggists' Advocate*, all of which have been largely taken advantage of by members who have not other opportunities of perusing these journals.

"In conclusion, your Council trust that the earnestness and energy which has hitherto characterized the members of your association will continue; and as we hope ere long to have increased facilities for meetings and mutual intercourse, may we always have in view the advancement of pharmaceutical science; and as our business is one of a humane nature, may we, in our studies as well as in the pharmacy, do our utmost to alleviate the sufferings of our fellow men."

Mr. YOUNG, treasurer, was then called upon, who read the financial statement of which the following is an abstract:—

RECEIPTS.

	£	s.	d.
To Balance from last year	4	18	1½
,, Donation, W. and R. Hatrick and Co.	1	1	0
,, Do. Wm. Greig (New Apothecaries' Co.)	1	1	0
,, Do. Thomas Davison	1	2	0
,, 4 Donations at 10s. each	2	0	0
,, 30 Subscriptions at 5s. each	7	10	0
,, 50 Do. at 2s. 6d. each	6	5	0
,, 6 Do. at 1s. each	0	6	0
,, 18 Fees for Chemistry Class at 15s. each	13	10	0
,, Attfield's 'Chemistry' for class	9	0	6
,, "Supper" account	16	0	0
	£62	13	7½

PAYMENTS.

	£	s.	d.
By Hall-Rent and Janitor's Fee	10	12	0
,, 18 Fees for Chemistry class, 21s. each	18	18	0
,, Attfield's 'Chemistry' for class	9	0	6
,, Printing Account	6	14	6
,, Supper Account	14	16	6
,, Postages, Stationary, etc.	1	14	4½
,, Balance on hand	0	17	9
	£62	13	7½

Audited and found correct.

(Signed) JOHN M'MILLAN, ROBT. T. DUN } *Auditors.*

Several motions where then brought forward, and referred to the Council for further consideration.

The election of officers, council, and auditors for the ensuing year was afterwards proceeded with, and the following were declared duly elected:—*President*, Mr. Thomas Davison; *Vice-President*, Mr. John Jaap; *Treasurer*, Mr. Wm. Young; *Secretary*, Mr. J. A. Clarke; *Council*, Messrs. Daniel Frazer, Alexander Kinninmont, Wm. Whyte, John Black (Rutherglen), John M'Millan, J. M. Fairlie, John Fenwick (Strathbungo), Robert Brodie, Archibald Paterson, Andrew Waddell, J. J. Weir and John Murdoch; *Auditors*, Messrs Robert T. Dun and Jas. L. MacMillan:

On the motion of the CHAIRMAN, seconded by Mr. A. W. RITCHIE, Messrs. Brodie and Fairlie were awarded a very hearty vote of thanks for their valuable services as vice-president and secretary to the Association during the last three years.

The meeting then separated.

THE NORTHAMPTON CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

The Monthly Meeting of the above Association was held on Thursday, April 25th, in their rooms in College Street Mr. MASTERS, President, in the chair. The Secretary (Mr. DRUCE) read the minutes of last meeting, and announced that they had received during the month a grant of ten pounds from the Pharmaceutical Society, a Bunsen's burner from Mr. Dadford, book for prescriptions from Mr. Negus, and Lindley's 'Introduction to Botany' from Mr. Barry.

Mr. MASTERS said he should be only expressing the feeling of all the members when he said how deeply gratified they were at having received the grant from the Council, and how each would do all in his power to show that the confidence put in them had not been misplaced; the apparatus and books which they had thus been able to purchase would prove invaluable to them in their practical chemistry class, which he had no doubt would prove very successful. He was sorry that the reading of papers did not occur more frequently. Some little misunderstanding must exist, he thought, as to what was required in a paper; he would suggest that it should be made as terse as possible, either original or a digest from the best authorities. Alluding to the method of preparing certain tinctures, he thought that percolation was not the best mode of procedure, and suggested that maceration for seven days, with frequent agitation, would give much better results. He also very strongly objected to the tinctures being made up with spirit to a definite quantity, as he believed it impossible by so doing to produce tinctures of the same strength by different makers.

After a long and exhaustive discussion, the SECRETARY read a paper on "The Origin and Early History of Chemistry," in which, after touching upon its probable beginning, and the discoveries made by the Egyptians, Arabians, and Chinese, and its eventual introduction into Europe, proceeded to notice the chimeras those early philosophers indulged in, namely, the Philosopher's Stone, the Elixir of Life, and the Universal Solvent, and the time wasted in their unprofitable employment. He concluded by saying that if they copied the alchemists in their perseverance, they would possess a philosopher's stone which would transmute base ignorance into pure knowledge; and, though they had not the elixir of life, yet they might have a greater satisfaction in knowing they had not misused their talents, and helped not only themselves but their fellows.

The President said he hoped that the half-yearly meeting would be held on the 2nd of May, and proposed that the Principals be invited to attend.

THE BRADFORD CHEMISTS' ASSOCIATION.

The following circular has been issued by the Council of the Bradford Chemists' Association:—

"The Council of this Society feels it to be a matter for deep regret that the lectures it instituted about three years ago should be discontinued for want of support by those they were intended to benefit. The aim of the Society was to help the assistants and apprentices then in the town to pursue their home reading preparatory to the examinations that are now required of all.

"This has been so strongly felt, that it has been urged that a vigorous effort should be made to rekindle the slumbering interest of the young men in this matter, and to press upon their attention its importance. It is with this object that negotiations have been entered upon with Mr. Callaway, Secretary and Curator to the Philosophical Society, to deliver a course of ten or twelve Lectures on Elementary and Structural Botany, to the Associates of the Society, gratis, on payment of their annual subscription.

"The Council also wishes to say a word with regard to the object and purpose of these and all lectures; that they are not intended, and cannot do away with the necessity for personal study and effort; but by conveying in a clear and systematic manner, the leading principles of the subjects treated of, they will greatly facilitate the progress of students, by enabling them to understand many difficult matters, that would altogether bar their progress without such help; the ultimate object being to shorten and make easy the study necessary for passing any of the examinations of the Pharmaceutical Society.

"In conclusion, the Council find it impossible to make personal solicitations of each individual, but as the matter is one of personal interest to all, it is hoped that all will join the class, and forward their names to Mr. Harrison, Mr. Bell, or Mr. Rimmington at once, so that arrangements can be completed for commencing the first week in May.

"F. M. Rimmington, }
"F. Bell, } Committee."

Parliamentary and Law Proceedings.

HOUSE OF COMMONS.

Monday, April 29th.

Juries Bill.

The second reading of the Juries Bill was deferred until Thursday, the 9th of May.

Public Health Bills.

The Committees on the Public Health Bill and the Public Health and Local Government Bills were deferred until Monday, the 6th of May.

Wednesday May 1st.

Adulteration of Food, Drugs, etc., Bill.

The Committee on the Adulteration of Food, Drugs. etc., Bill, was deferred till Wednesday, the 15th of May.

Correspondence.

Election of Council.

Sir,—I have received from the Chemists' Defence Association a circular setting forth the names of fourteen persons selected from the list of gentlemen nominated for the ensuing Council, as being the most fit for election. The issue of this circular under the heading, "Pharmaceutical Society of Great Britain," renders it incumbent on those who desire to to maintain the independence of individual members to protest most strenuously against this usurpation of the name of the Pharmaceutical Society of Great Britain.

There are doubtless good names on this list, but when the Council absolutely needs an increase in the number of London members, why should such men as Messrs. Savory, Stacey, Malden, Burdon, Carr, Starkie, and Wade be handicapped?

Fair Play.

Sir,—I did not intend to trespass upon your space, or in any way advocate my claim to a seat in the Council, but as an opinion exists that if each candidate publicly expressed his sentiments, it would enable voters to judge for themselves who best represented their views, and so obviate the necessity for any individual or party to select for them, or to attempt to bias, or blindly lead in favour of one or the other; therefore, with your permission, I will briefly state the reasons that induced me to accept the honour, having been nominated for the Council.

For many years before the passing of the Pharmacy Act, it is well known I took a prominent part in all that related to the bringing about the incorporation of the trade, exemption from jury service, and associating outsiders with pharmaceutists in friendly co-operation. After three years I find little has been done by the Society and its Council, to enable it to say it faithfully represents the trade, or more than one section; and yet it was constituted the governing body over all. I am convinced that the true policy of the Society, both for financial reasons and political strength, is to secure the support of that large body of outsiders, who, for some cause to be ascertained, have as yet refrained from giving their confidence. My desire is, and will be, if elected, to make the Society honoured and approved by all chemists and druggists, to offer such inducements as will bring members and friends to the succour of the Institution, to cause its educational means to be as useful and well applied in provincial schools as at the Metropolitan Academy, to give confidence in the distribution of its funds to those who now lack it, by having none to represent them or their donations.

I desire the Council to become thoroughly representative, strong in the support of all classes, a power capable of resisting medical influence or dictation, able to combat restrictive legislation that does not emanate from itself, for its own security.

I would uphold the right of every man to carry on his business as heretofore, without penalties, or what is still more odious, Government surveillance, whether it be dispensing or general trade. My proceedings last year in opposition to the compulsory regulations, and the amendment which settled the question at the annual meeting, are substantial evidence of my aversion to that unnecessary and objectionable measure.

I regret finding myself antagonistic to many efficient and excellent men who will contest the election, but who in my opinion too strongly represent high-class pharmacy, to the prejudice and indifference of the middle-class and ordinary druggist; but if the propositions I have advanced are agreed to by any members, and who believe with me that the Society is competent to become of greater utility, if worked on a wider and more liberal basis, then I respectfully solicit their votes and interest.

April 29th, 1872. John Wade.

J. Levers.—Your letter has been handed to the Secretary. We are requested to say that it was a printer's error.

We are compelled from want of room to defer the publication of several communications and answers to correspondents.

Communications, Letters, etc., have been received from Mr. A. Weavers, Dr. C. R. A. Wright, Mr. Wilkinson, Mr. Bell, Mr. Pocklington, Mr. Druce, Mr. Cooper, Mr. Stott, Mr. Proctor, Mr. Hayland, Mr. Ellwood, Mr. Richardson, "Chemist and Druggist."

OBSERVATIONS ON TESTS FOR QUININE AND MORPHINE.*

BY PROFESSOR FLÜCKIGER.

The most characteristic test for ascertaining the presence of quinine is the formation of the splendid green compound called *Thalleiochine*, which is produced if solutions of the alkaloid or its salts are mixed with chlorine-water and then a drop of ammonia added.

It is known by Pelletier's researches that some other alkaloids are also altered by the above treatment, yet without assuming the same colorations. Morphia, for instance, shows a red hue, very quickly turning dark brown.

I was induced by a lamentable poisoning case to examine the behaviour of the two alkaloids when mixed. The first question was to ascertain the smallest quantity of *quinine* which, in solution, displays the green colour. If one part of quinine is dissolved in 4000 parts of acidulated water and then about $\frac{1}{10}$ of the volume of the liquid of chlorine-water and a drop of ammonia added, a green zone will be readily formed if the liquids are cautiously placed in a flask without shaking. If the solution of quinine contain no more than $\frac{1}{5000}$, the green zone may still be obtained, but in more diluted solutions the success becomes more and more uncertain. From a practical point of view we may state that $\frac{1}{5000}$ of the alkaloid is the smallest quantity whose presence can thus be discovered with certainty. Kerner (1870) has succeeded with $\frac{1}{20000}$, but I was not able to corroborate this statement.

As to morphine, its solutions assume a yellow hue if chlorine is added, whereas chlorine does not at all alter the colourless solutions of quinine. The dark brown coloration of *morphine* in solution, to which chlorine-water and ammonia have been added, is no longer produced if less than $\frac{1}{1000}$ of morphine is present.

From these observations it may be foreseen what must happen if a mixture of salts of both those alkaloids be tested by chlorine and ammonia. The green colour, thalleiochine (thalleioquine), will appear notwithstanding the morphine if the amount of the latter is less than $\frac{1}{1000}$ of the solution. But the test for quinine fails if there be more than $\frac{1}{1000}$ of morphine present, even when the quinine is in considerable quantity. The green colour of the thalleioquine is enveloped by the dark dingy-brown colour due to the salt of morphine.

In a specimen of quinine containing morphine, or *vice versâ*, the presence of either of them can be shown as one pleases by means of chlorine and ammonia. In the comparatively concentrated solution the brown colour of morphine will make its appearance, whereas thalleiochine results as soon as the quantity of the solvent much exceeds the proportion of 1000 parts to one of morphine.

This is an illustration of the importance of not relying upon one test alone. In the fatal case alluded to, the presence of quinine happened to be ascertained, but morphine was overlooked. There was certainly no reason for presuming the presence of the latter, but one drop of nitric acid poured on the supposed hydrochlorate of quinine would have pointed out the presence of morphine, and spared the lives of two women.

I was curious to know the effect of bromine instead of chlorine in the above tests. The salts of morphine are apparently not altered by bromine and ammonia, but salts of quinine are more intensely coloured by the latter process. The thalleioquine is then indeed produced in solutions which contain only $\frac{1}{20000}$ of quinine. Yet the behaviour of bromine displays some striking differences. Chlorine alone, as already stated, causes no immediate alteration of somewhat diluted solutions of quinine, whereas they become turbid on addition of bromine as long as there is about $\frac{1}{2500}$ or more of quinine present. Now the precipitate which is produced by bromine in the solution of quinine does *not* turn green if a little ammonia is subsequently added, or, at least, the thalleioquine thus obtained is rather greyish. But in more dilute solutions of quinine, bromine acts more readily than chlorine. An excess of bromine is to be carefully avoided. This is easily performed if the vapour of bromine, not the liquid bromine itself, is allowed to fall down on the surface of the solutions of quinine; their superficial layer only must be saturated with bromine by gently moving the liquid. Then a drop of ammonia will produce the green or somewhat bluish zone, which is much more persistent than that due to chlorine.

Consequently, for demonstration of the test under notice, chlorine is to be used in comparatively concentrated solutions. In solutions containing so little quinine (less than $\frac{1}{2500}$), that it is no longer precipitated by vapour of bromine, the thalleioquine test succeeds much better with bromine, and goes much further, as shown above.

A well-known test for morphine is iodic acid, which is decomposed by the alkaloid, and forms a beautiful violet solution with bisulphide of carbon or chloroform. This test succeeds with solutions containing no more then $\frac{1}{10000}$ of morphine.

* Abstract of a paper contained in the 'Neues Jahrbuch für Pharmacie,' April, 1872, p. 136.

EMULSIONS.

BY R. ROTHER.

A perfect emulsion is a homogeneous liquid, more or less fluid, in which an oily substance, in an extreme state of mechanical division, is permanently suspended. The requisite ingredients of which an emulsion is composed are, primarily, an oily substance which constitutes the medicinal agent to be administered, then a mucilaginous or viscid body, by means of which the oil is divided and suspended, and finally an aqueous liquid, which, rendering the action of the second component available, also serves as the diluent and vehicle.

Emulsions may be classified as of two kinds, according to their origin, namely natural and artificial, —the first being the result of organic action, and the second, as the name implies, the work of art.

Natural emulsions are, firstly, milk and the yolk of eggs; secondly, the gum resinous juices of many plants, of which familiar examples are myrrh, ammonia and assafœtida; and, thirdly, numerous oleaginous seeds, familiar examples are the almond, flax and hemp seeds. The natural emulsions are all perfect, however much they may at first differ in physical appearance. The apparent difference is caused by a predominance or deficiency of water. The seeds finely triturated and gradually mixed with water, the gum-resins somewhat similarly treated, and the yolk simply diluted with water, will then all assume the physical characteristics of milk.

A perfect artificial emulsion is physically identical with the natural,—that is, as far as the extinction of the oil is concerned,—and this peculiarity is, in fact, the distinctive feature of an emulsion.

The preparation of a correct emulsion has been rightly judged as one of the most difficult tasks of the dispenser,—so much so, that a successful issue of the operation was attributed more to the dexterous skill of the manipulator than to the application of any particular method. However, as a successful result is not always assured, even in the aptest hands, it scarcely admits of a doubt that most of the manipulations now in use for the production of emulsions are utter failures—failures so far as to preclude the probability of an invariably definite result, not to say but that chance would frequently likewise lead to the same. The desideratum, therefore, consists in a process which, under certain necessary conditions, will always yield a perfect emulsion. To arrive at this, it is, firstly, required to examine the methods at present in use, and, secondly, necessary to inquire into the conditions most favourable for the production of an emulsion, and the principles upon which its formation rests. The following processes are such as came under the writer's observation:—

Firstly, the most inefficient of all methods was one strongly suggested in the *Druggists' Circular* a number of years ago, which consisted in shaking the oil, gum and water in a bottle until the emulsion was formed; it did produce a sort of mixture, but not what pharmaceutists usually accept as an emulsion. The shaking process is admirable for effecting solutions, but not so effective as the mortar and pestle for mechanical combinations.

The second process required that sugar, gum and oil be all rubbed together in a mortar, and then water be gradually added in small portions, with constant trituration. By chance a good emulsion would occasionally result in this manner, but mostly a large proportion of water would be absorbed, and the mixture still be too thick to pour. After a short time the peculiarly slimy mixture would suddenly resolve itself into a curdy or granular-appearing liquid having considerable fluidity. The same phenomenon occurs if a moderately increased quantity of water is added at once to the slimy combination, and then slowly stirred. After this relapse, the mixture could occasionally be doctored into a passable combination, by introducing more gum and triturating violently. But, in either case, most of the oil would rapidly separate on standing. It was supposed in this instance that the sugar greatly aided the process, but in the writer's experience sugar is really detrimental to the formation of emulsions. This process, among all the rest, is the most fatal, as in case of failure the loss of both time and material is incurred. The operation is more successful, however, if the sugar be added to the mixed oil and gum in the condition of syrup, and then followed by water.

By a third process, devised by Overbeck, given in a note to the U.S. Dispensatory, and also recommended by Mohr in his 'Pharmaceutical Technics,' a definite quantity of oil, gum and water, in proportions adjusted according to the nature of the oil that is employed, is all rubbed up at once in a mortar, and, when the proper union has taken place, more water is gradually added. This method is quite good, and yields very few failures where the oil does not exceed 2 fluid ounces, but with 4 fluid ounces of oil in one quantity the process becomes precarious.

A fourth method is given in the U.S. Dispensatory. According to it the gum is first mixed with water, in the same proportion as it exists in the officinal mucilage of the Pharmacopœia, the oil then added, mixed and diluted with the prescribed amount of water. In this case the oil is usually added in a thin but continuous stream with rapid stirring. This process is nearly as good as the preceding one, but often the emulsion is not as perfect as it should be.

These operations have mostly reference to the fixed oils and balsams, and are not equally applicable to the volatile oils, which, as a class, are much more difficult to emulsify. Experience demonstrates that the thicker and more viscid the oil the easier it is emulsified. The volatile oils, owing to their great mobility, are the most difficult to overcome. Castor oil and oil of turpentine are typical of these opposite extremes.

Thus it becomes evident from the disconnection and dissimilarity of these methods, that the true principle upon which the process of emulsification depends, has been either entirely unknown or completely disregarded. A perfect emulsion is characterized by its dazzling whiteness, its uniformity, and the property which admits of its dilution to even an extraordinary extent without destroying it appearance or identity. The incipient or complete emulsion, in its most concentrated form, from the moment of its generation, is unmistakably distinguished by its whiteness, and the peculiar tenacity which causes the pestle, when moved through it, to give the characteristic crackling sound of the emulsion; when these indications evince themselves the success of the operation is assured.

Now, the writer observed that by following Overbeck's method, and using a broad mortar, if the trituration be confined to a narrow space for a moment until perfect emulsification had taken place, even in a small portion of the material, and then gradually bringing the rest of it within this centre, a perfect emulsion was invariably attained. Applying this manner of manipulation in the process of the U.S. Dispensatory, that is, instead of pouring the oil upon the mucilage in a continuous stream, adding only a small portion at first; this, with the large proportion of mucilage, never fails to emulsify. The remainder of the oil is then added in small quantities at a time, and each perfectly emulsified before introducing the next. Finally, the perfect emulsion is diluted to the required measure. The writer now further observed that when the proportion of oil was great, in comparison to the mucilage, a time would arrive during the addition of the oil when this ceased to merge with the emulsion; in no instance, however, was the previously-formed emulsion ever disintegrated or deranged. Therefore, it was assumed that the inaction originated in a deficiency of water, consequently this addition was made, and complete emulsification again and immediately resulted. The addition of oil was then continued, occasionally adding water, until the original volume of mucilage had lost its comparative individuality in the overwhelming proportion of the oil, and still the process of emulsification progressed. The emulsion, during any period of the operation, could be diluted with water to any desirable volume without decomposition. This principle was now applied to oil of turpentine, assumed to be the most refractory in the category of oils.

Two fluid drachms of officinal mucilage of acacia was placed into a broad, conveniently-sized mortar, and diluted with one fluid drachm of water. Half a fluid drachm of oil of turpentine was then added, and the whole triturated a few moments until the oil was emulsified. One and half drachms of oil was then added, in half-drachm portions, emulsifying each before adding the next: this was followed by one drachm of water. Five fluid drachms of oil was now introduced in the same manner as before, and again followed by half a drachm of water. After this three drachms of oil were again incorporated as above, and still the emulsion retained its perfect appearance, and ever ready to extinguish quantities of oil to an almost unlimited extent. However, this was not required, and therefore the incorporation of oil was here discontinued, and the emulsion diluted with water.

Upon these deductions, the following theory is established :—A concentrated, perfect emulsion is in itself the most rapid and efficient emulsifier, and possesses the property of emulsifying oil to an almost unlimited extent.

This theory is expressed in the following rule of the emulsion :—

Introduce the emulsifier into a broad, conveniently-sized mortar; this may be already a perfect emulsion, as the yolk of eggs, but if it is gum this must be in the form of mucilage, either thick or thin, according to the nature of the oil. Now pour in a small quantity of oil, and triturate this with the mucilage until a perfect emulsion has formed, then add the rest of the oil in small portions at a time, and not until the previous addition has been perfectly emulsified, adding small quantities of water at intervals, as the indications may require. Finally, when all the oil has been incorporated, gradually add the prescribed volume of diluent. When both a fixed and volatile oil are prescribed in an emulsion, the fixed oil must be emulsified first before the addition of the other.—*The Pharmacist.*

Chapters for Students.

CHEMICAL NOTES TO THE PHARMACOPŒIA.

BY WILLIAM A. TILDEN, D.SC. LOND.

DEMONSTRATOR OF PRACTICAL CHEMISTRY TO THE PHARMACEUTICAL SOCIETY.

Sodii Chloridum, $NaCl$.—Chloride of sodium is found in greater or less quantity in the waters of all springs and rivers, and abundantly in sea-water. In the massive crystalline form, as "rock salt," it also occurs in beds of vast extent and considerable thickness, which are generally supposed to have been formed by the gradual drying up of inland seas.

It is from this source that all the table salt of commerce is obtained. Bay salt is produced from sea-water. Common salt is the chief source of other sodium compounds.

[§ It imparts a yellow colour to flame. The solution is not precipitated by perchloride of platinum, but gives with nitrate of silver a white precipitate ($AgCl$) soluble in ammonia, but insoluble in nitric acid.]

Common salt never consists of perfectly pure chloride of sodium, but contains small quantities of chloride of magnesium and of sulphate of sodium. The presence of the former explains the slightly deliquescent character of ordinary salt, and its action in discolouring silver spoons left in contact with it.

Spiritus Ætheris Nitrosi.—A solution of ethylic nitrite with aldehyd, and frequently other substances, in rectified spirit.

When a mixture of alcohol and nitric acid is submitted to distillation, no *nitrate* of ethyl is obtained as might, at first sight, be expected; but when the acid becomes sufficiently concentrated, a reaction sets in, in which part of the alcohol is oxidized and part converted into nitrite of ethyl.

$$\underset{\text{Alcohol}}{C_2H_5HO} + \underset{\text{Nitric acid}}{HNO_2O} + \underset{\text{Alcohol.}}{C_2H_6O} =$$
$$\underset{\text{Ethyl Nitrite}}{C_2H_5NO_2} + \underset{\text{Water}}{H_2O} + \underset{\text{Aldehyd}}{C_2H_4O} + \underset{\text{Water.}}{H_2O.}$$

The aldehyd, which is the principal product of the oxidation of the alcohol, distils over with the ether, accompanied by traces of acetic acid, and often of other bodies.

The process of the B. P. was devised with the view of obtaining a more uniform product by moderating and regulating the action of the nitric acid. Pharmaceutically speaking it is an admirable process, though it does not yield nitrous ether in a state even approaching purity.

A solution of nitric and sulphuric acids in rectified spirit is distilled from a retort containing copper turnings. At a temperature of about 175°–178° F. the liquid becomes covered by a head of froth, and the liquid distils rapidly for some time till, at a certain point, the froth somewhat suddenly subsides; more nitric acid is then added and the process resumed.

The copper was originally employed with the idea that it would, with the aid of the sulphuric acid, reduce the nitric to nitrous acid,—

$$\underset{\text{Nitric Acid}}{HNO_2O} + \underset{\text{Sulphuric Acid.}}{H_2SO_4} + Cu =$$
$$\underset{\text{Nitrous Acid}}{HNO_2} + \underset{\text{Water}}{H_2O} + \underset{\text{Sulphate of Copper.'}}{CuSO_4}$$

and that the latter would react in a simple manner upon the alcohol. Thus

$$\underset{\text{Nitrous Acid}}{HNO_2} + \underset{\text{Alcohol.}}{C_2H_5HO} =$$
$$\underset{\text{Nitrite of Ethyl Or Nitrous Ether.}}{C_2H_5NO_2} + \underset{\text{Water.}}{H_2O}$$

This occurs, however, only to a limited extent, and consequently the resulting spirit still contains nearly as much aldehyd as the old-fashioned spirit of nitre.

The aldehyd may be recognized by warming the spirit with an equal volume of liquor potassæ. A peculiar yellow soapy-smelling, resinoid compound, characteristic of aldehyd, is deposited on cooling. It cannot, however, be made to reduce silver in the form of a mirror, as is the case with aqueous solutions.

When any solution of nitrous ether is heated in a sealed tube with strong ammonia, nitrogen gas is evolved and alcohol generated.

$$\underset{\text{Nitrite of Ethyl}}{C_2H_5NO_2} + \underset{\text{Ammonia}}{NH_3} =$$
$$\underset{\text{Alcohol}}{C_2H_5HO} + \underset{\text{Nitrogen}}{N_2} + \underset{\text{Water.}}{H_2O}$$

The Sp. Æth. Nitr. of the Pharmacopœia is represented as containing ten per cent. of ether, of which two per cent. separates on agitation with saturated solution of chloride of calcium. Whether so much as eight per cent. remains unseparated is, however, very doubtful. Experiments on this point are wanted.

[§ It effervesces feebly or not at all when shaken with a little bicarbonate of soda. When agitated with solution of sulphate of iron and a few drops of sulphuric acid, it becomes deep olive-brown or black.]

The acidity is generally due to acetic acid, but in old specimens it is much increased in consequence of decomposition resulting in the formation of oxalic, formic, glycolic and glyoxylic acids, and doubtless other bodies. Acid spirit of nitre may thus be regarded as containing nascent nitrous acid, and, therefore, when mixed with iodide of potassium it frequently liberates iodine. This may be prevented by previously shaking it up with a few crystals of bicarbonate of potash.

(*To be continued.*)

THE SO-CALLED AFRICAN SAFFRON.

BY JOHN R. JACKSON, A.L.S.

(*Curator of the Museums, Kew.*)

From the description of the so-called African Saffron by Professor Maisch at p. 824 of the Journal, there seems no doubt but that the flowers are those of *Lyperia crocea*, Eckl., a scrophulariaceous plant of South Africa, small quantities of which have been imported into this country from time to time, chiefly for use as a dye. The following description of the plant and its uses is given by Dr. Pappe in his 'Floræ Capensis Medicæ Prodromus":—

"A little branchy shrub. Leaves very small, wedge shaped, fasciculate, obtuse, entire, smooth. Peduncles elongated, axillary. Flowers sub-racemose, yellow. Tube of the corolla much longer than the calyx. This bush deserves notice as a drug; and in all probability will, before long, become an article of colonial export. It grows abundantly in some parts of the Eastern districts, whence it has found its way into the dispensary. The flowers, which are called *Geele bloemetjes*, closely resemble saffron in smell and taste; they possess similar medical properties, and as an antispasmodic, anodyne and stimulant, ought to rank with the *Crocus sativus*. Here, they have as yet been only used with success in the convulsions of children, but they deserve a more general trial. On account of the fine orange colour which they impart, they are in daily request among the Mohammedans, who use them for the purpose of dyeing their handkerchiefs. This drug has been observed to be sometimes adulterated by the admixture of other plants of the same genus which are less efficacious."

About thirty species are recorded of the genus, all natives of the Cape Colony, and the flowers are mostly yellow or purple, always turning black in drying.

THE NATURAL HISTORY AND COMMERCE OF SPONGES.

BY JOHN GIBSON.*

(*Concluded from* p. 867.)

The sponges of English commerce are of two kinds, Turkish and West Indian. The Turkish sponge is found throughout the Mediterranean, but it is principally obtained from the eastern extremity of that sea, where, especially in the Grecian Archipelago, the islands of Cyprus and Crete, and the shores of the Levant, the fisheries of sponge take the place of the coral fisheries on the Italian coast. Along the coasts of Tunis, Barbary and Algiers an inferior kind, of a large-holed texture, known as the 'horse' sponge, is obtained. Sponges are found at greatly varying depths, but it is observed that those brought up from comparatively shallow water are usually of coarser quality; and that to obtain the soft, delicate ones, it is often necessary to descend to a depth of thirty fathoms. Aristotle observed this fact and tried to account for it. He says, "In general, those which grow in deep and still water are the softest, for the wind and waves harden sponges as they do other things that grow, and check their growth." Whether this be the true explanation or not, certain it is that our finest sponges are all brought up from a depth of at least eight fathoms. They are obtained by diving, an art to which the inhabitants of the Grecian isles and the surrounding coasts are specially trained from their earliest years, and dexterity in which is considered one of the first qualifications in a husband, while, in some places, it seems at one time, to have been considered a scarcely less important female accomplishment. Pomet, in his 'Complete History of Drugs,' says "The greatest part of the sponges that are sold come from the Mediterranean, and there is a certain island of Asia that furnishes us with a very large quantity of sponges. This isle is called Icarus or Nicarus, where the young men are not allowed to marry till they can show that they can gather sponges from the bottom of the sea; and for this reason when any one would marry his daughter, a number of young fellows are stripped and jump into the sea, and he that can stay longest in the water, and gather the most sponges, marries the maid."

These Icarian fathers evidently put little value on being over "head and ears in love," unless it be accompanied by a fair development of the power to remain over head and ears in water.

In his 'Voyages and Travels in the Levant,' Hasselquist tells of a somewhat similar custom, though rather differently applied. He says, "Himia is a little and almost unknown island, directly opposite Rhodes; we saw it in the morning on our right hand. It is worth notice, on account of the singular method the Greeks—the inhabitants of the island—have to get their living. In the bottom of the sea, the common sponge (*Spongia officinalis*) is found in abundance, and more than in any other place in the Mediterranean. The inhabitants make it a trade to fish up this sponge, by which they get a living far from contemptible, as their goods are always wanted by the Turks, who use an incredible number of sponges at their bathings and washings. A girl in this island is not permitted by her relations to marry before she has brought up a certain quantity of sponges, and before she can give a proof of her agility by taking them up from a certain depth." At the present time the Ottoman sponge fishery alone employs from four to five thousand men, who form the crews of about six hundred boats. On reaching the scene of operations, the diver finds his way to the bottom, taking with him a piece of stone of a triangular shape, with a hole drilled in one of its corners, through which a cord is passed connecting him with the boat. Having reached the growing sponges, he tears them off with his hands, sometimes

* Read at a Meeting of the North British Branch of the Pharmaceutical Society, April 18, 1872.

making use of a knife, and puts them under his arm; he then pulls the cord by which the signal is given to his companions to haul him up. Practice enables these sponge divers to stay under the water for a considerable time, in some instances as long as two minutes, although the average time of submersion is not more than eighty seconds.

Another mode of obtaining the sponge is by means of a pronged instrument. This is the plan adopted by the Greeks in the Morea, and also by those engaged in the sponge fisheries of the West Indies and coast of Florida, but the sponges thus obtained are generally torn, and sell at a low price. On removing the sponge from the water the gelatinous matter, which is of a brownish-yellow colour, and of a decidedly fishy odour, begins to run freely from it; it is necessary, however, to hasten this process in order to prevent the evil effects of putrefaction. For this purpose the sponge gatherers dig round, shallow holes in the sand along the shore filled with water, in these the living sponges are placed, and then trampled upon until their canals are entirely free of the gelatinous protoplasm, and nothing remains but the keratose skeleton known as the sponge of commerce, together with a certain quantity of sand taken in at the pores during this process, and which is got rid of afterwards. Of the two principal kinds of sponges brought into the English market, namely, the Mediterranean and the West Indian, the former are the most highly valued; and of these the sponges found in Turkish waters, and especially those along the coast of Crete, fetch the highest price in the market. They are known as Smyrna or Turkey or Greek sponges, and may generally be distinguished by their cup-like shape. They grow in masses from the size of a man's fist to that of his head, and as compared with the 'horse' sponge of the Barbary coast, or the huge species found in the West Indies and known as the 'Bahama' sponge, they are much closer and softer in texture, and less liable to tear. They appear to be somewhat rapid in their growth, as it has been noticed that a period of two years usually suffices to renew the crop of sponges on spots that had been laid almost bare by the sponge divers.

The importance of this branch of industry appears from the quantity of sponges which are annually imported by Great Britain alone. The total import for 1869 amounted to 1,221,000 lb. of sponge, valued at £157,000, of which from 200,000 lb. to 300,000 lb. came from the ports of the Mediterranean, and the remainder from the West Indies and the north Atlantic ports.

Although the term 'sponge' is usually associated in our minds with the commercial article, there are many other forms totally unlike, but which are as much entitled to the name as are those on our toilette table. Of these our own country possesses many species, none of which, however, have either the softness or the elasticity which gives its main value to the sponge of commerce. Dr. Bowerbank, who has written a valuable monograph on the British sponges, divides the class into three orders. The *Calcarea*, or those in which limy matter predominates; the *Silicea*, or those in which silica or flint forms the chief ingredient, and this order includes most of our British sponges; the third division is the *Keratose*, or those in which a horny substance known as *keratose*, forms either the entire skeleton or the greater part of it, and it is to this order that the sponges of commerce belong.

Among British sponges the following may be noticed:—The fresh-water sponge—*Spongilla fluviatilis*, which abounds in our rivers and canals. It is of a green colour when growing in situations exposed to the sun's rays, and of a dirty brown when otherwise situated. It is a curious fact that its green colour is owing to the presence in it of chlorophyll, the substance to which the leaves of plants owe their colour. The *Halichondria punicea*, found coating many of the rocks along our coasts. In this sponge the oscula are very distinctly seen, forming, as they do, the summits of little tubular eminences. A section of this, placed in a drop of water, under the microscope, shows jets of the most beautiful and varied colours issuing from the oscula like molten lava from the crater of a volcano. The several species of *Cliona* are remarkable for their habit of boring into the shells of mollusks, and thus causing the creature inside to form layer after layer of shell in order to keep back the would-be intruder.

Of foreign non-economic sponges, by far the most wonderful is the 'Venus' Flower Basket,'—*Euplectella Aspergillum*—certainly one of Nature's loveliest works. It consists of a tubular body about one foot in length, and from one to two inches in diameter, composed of a beautifully interlaced network of siliceous spicules, with its base enclosed in a thick tuft of siliceous glass-like threads, and its upper extremity closed by a curious piece of siliceous basket work. It is found in the Philippine Islands, where it is known as the *Regadera* or 'Watering-pot,' and is still supposed by the inhabitants to be the workmanship of a crab, from the fact that one and sometimes two crab-like crustaceans are generally found shut up in the hollow of the sponge. The lid-like covering at the upper extremity of the Euplectella is the portion of the skeleton last formed, so that the crab must make the sponge its habitation while it is open at the one end, and thereafter must remain a prisoner for life, dependent for its subsistence upon any food that may gain entrance through the network of its prison. These sponges are found at a depth of about 130 fathoms on a mud bank three miles from the coast of one of the Philippine Islands, where they are dredged for by the natives. When taken out of the water, they are of a dirty yellowish colour, but by washing in fresh water and exposure to the bleaching influence of the atmosphere they become a pure white, the condition in which they are usually brought to this country. The first entire specimen—that described by Owen in 1841, and now in the British Museum—was sold for £30, but of late years they have become more plentiful, and in 1867 were selling at between £3 and £4. Another sponge, found in Japanese waters and known as the 'glass rope," is somewhat allied to the *Euplectella*. It was first described as a vegetable production under the name of the 'glass plant;' subsequently Prof. Ehrenberg and others regarded it as an artificial production with which the Japanese sought to impose upon the credulity of the "Western Barbarian," but now it is recognized as the type of the genus *Hyalonema* of sponges.

We are all acquainted with the many uses, both in domestic economy and surgical operations, to which sponge is applied, and for which its power of absorbing liquids and of retaining them until forced out by compression, combined with its delicious softness, peculiarly adapts it. Formerly sponges were burned, and when reduced to a powder used as a remedy for scrofula, but any virtue it possessed was entirely owing to the presence of iodine and bromine, substances which are now obtained in larger quantities from other sources.

Sponges of all kinds are rich in nitrogen, containing about 16 per cent. of it, and where they abound in sufficient quantities on our coasts might be profitably manufactured into a valuable manure. One species—*Spongia tomentosa*—found on the coasts of England and North America, raises blisters when rubbed on the skin, a power which can be intensified by previously drying it in an oven. These are some of the uses to which man has, or might apply the sponge; but what, it may be asked, is its use in the economy of nature? It does not appear to constitute the food of any other class of animals; and though various mollusks and other creatures may habitually dwell in the network of certain of its species, yet, as Dr. Johnston remarks, "these are too trivial offices for so large and widely spread a family;" and the same writer thinks that "probably the power which its members possess of reducing to a solid condition the horn, the flint and the lime of the waters they live in, is what constitutes their importance among rival entities, and gives them a certain influence over the phases of this ever-changing globe — an influence not to be underrated when we take into account their vast numbers and universal diffusion; their size in more genial seas; and, above all, their unceasing operation in the waters, continued from age to age without a moment's intermission." And this view, especially as regards the aggregation of silex or flint, seems fully borne out by geological evidence. The large flint nodules found in the English chalk, and from which all the flint we have is derived, are supposed to be fossilized siliceous sponges whose presence in those ancient seas induced the deposit of silex around them; and thus it is that in very many flints we find a piece of fossil sponge in the centre, as a sort of nucleus for the surrounding layer of silex. It does, however, seem strange that to one of nature's softest productions we should owe one of its hardest, that the sponge of the past should be the flint of the present.

ON THE AMOUNT OF MOISTURE CONTAINED IN AIR-DRY DRUGS.

BY GEO. W. KENNEDY.

How many pharmacists would believe it if informed that the drugs which they are daily handling contain from 10 to 18 per cent. of moisture, which they lose in drying? I myself could scarcely credit it when my first experiments were made, and thought I might have lost some of the drug between the repeated weighings, but repetition of the experiments always confirmed the results previously obtained. Even the powders, which are supposed to be dry or very nearly so, lose in some cases from 8 to 10 per cent. of moisture.

I have experimented with a large number of drugs, sufficient, I believe, to give the pharmacist a true idea of the amount of moisture contained in them, and the results show conclusively that such pharmaceutical preparations like syrups, tinctures, fluid extracts, etc., must be much weaker when prepared from merely air-dry material than when made from anhydrous drugs.

The process of drying was conducted in a common cooking-stove oven, at a temperature of about 120° Fahrenheit, to which the drug was exposed until it ceased losing any more weight. By being exposed to a low but continuous heat, the loss in volatile oil may probably be greater than when the drug is dried at an elevated heat, but its normal amount is very small in most of the drugs experimented with, so that the deduction of the volatile oil expelled in drying would alter the figures below but little.

The dried drugs were placed in a room for two weeks and then re-weighed, the increase of weight representing the amount of moisture reabsorbed in that time. While these experiments were made the weather was cold and dry, and this circumstance doubtless accounts for the smaller percentage absorbed again, while in a few cases the loss of volatile oil may explain a portion of the deficiency.

The following tables show the loss sustained by the drugs mentioned, and the gain in weight of the dried articles under the circumstances mentioned above:—

	Loss.	Gain.	Yield by re-absorption.
1. Roots, Rhizomes, etc.			
Lappa	16·25	83·75	10·40
Calumba	16·	84·	11·50
Taraxacum	15·25	84·75	9·75
Asclep. tuberosa	15·25	84·75	10.75
Cypripedium	14·	86·	5·
Gentiana	13·	87·	9·
Panax	12·75	87·25	4·75
Krameria	12·67	87·33	9·17
Polygonatum	12·60	87·40	6·80
Scilla	12·50	87·50	8.50
Althæa	12·50	87·50	8·50
Gossypium	12·40	87·60	6·40
Helleborus niger	12·	88·	8·25
Colchicum	11·50	88·50	8·
Inula	11·40	88·60	6·40
Rheum	11·33	88·67	8·33
Spigelia	11·25	88·75	7·25
Podophyllum	10·33	89·67	6·73
Serpentaria	10·33	89·67	5·83
Senega	10·30	89·70	5·76
Asarum canadensis	10·25	89·75	3·85
Valeriana	10·20	89·80	6·
Sarsaparilla	9·	91·	4·50
2. Stems and Wood.			
Dulcamara	12·	88·	6·33
Quassia	10·	90·	8·
3. Barks.			
Rhus glabrum	14·67	85·33	8.67
Xanthoxylum	14·50	85·50	8·50
Cinnamomum	10·50	89·50	6·50
Prunus Virg.	10·	90·	5·25
Cinch. calis	9·	91·	2·80
4. Herbs.			
Absinthium	14·	86·	8·50
Hedeoma	12·25	87·75	8·25
Lobelia	11·60	88·40	5·60
Leonurus	10·80	89·20	5·20
Glechoma	10·33	89·67	6·33
5. Leaves.			
Uvularia perfol.	18·	82·	8·
Conium	16·	84·	6·
Cataria	14·50	85·50	11·50
Aconitum	14·	86·	9·25
Belladonna	13·75	86·25	5·75
Hyoscyamus	12·25	87·75	5·85
Senna Alexand.	12·20	87·80	7·20
Melissa	11·75	88·25	7·80
Matico	11·	89·	6·
Tussilago	10·50	89·50	4·67
Salvia	10·50	89·50	8·
Stramonium	10·33	89·67	7·83
Rosmarinus	10·25	89·75	6·65
Uva ursi	10·	90·	4·
Buchu	9·20	90·80	4·40
6. Flowers.			
Lavandula	14·25	85·75	7·75
Arnica	13·80	86·20	8·80
Anthemis	9·80	90·20	6·80
7. Seeds.			
Stramonium	10·	90·	7·
8. Powdered Drugs.			
Rheum	8·25	91·75	5·25
Inula	8·33	91·67	5·30
Calumba	8·50	91·50	7·
Colchici Rad.	9·	91·	6·
Sanguinaria	9·	91·	7·
Cimicifuga	9·80	90·20	4·80

Amer. Journ. Pharm.

THE CALABAR BEAN.*

BY DR. L. VINCENT.

In a sojourn of nearly two years at the Gaboon, during which time he had opportunities of studying the numerous substances possessing medical properties produced in that part of equatorial Africa, Dr. Vincent's attention

* Journ. Pharm. et de Chimie [4], vol. xv. p. 109.

was particularly directed to the Calabar bean. It is used in that country, together with several other toxic agents, such as the *Icaza m'boundu*, the *Inee*, the *Alchiuse*, etc., by the tribes still plunged in barbarism and fetichism, for the compounding of their ordeal drinks. From a memoir giving the result of his inquiries we are enabled to glean the following particulars:—

The first specimens of this drug were sent to Europe by English missionaries from Old Calabar, where the natives called it "*éséré*." About ten years afterwards its botanical position was assigned by Professor Balfour, and at nearly the same time Dr. Fraser, of Edinburgh, while studying its physiological properties, discovered the remarkable property it possesses of contracting the pupil of the eye. In 1866 it was found in the French possessions in the Gaboon, not far from the banks of the rivers Como and Rhamboë. It is also found in abundance on the banks of the Ogo-wai; and as the physostigma prefers marshy and humid soils, it is probable that it occurs on the borders of all the rivers flowing into the Atlantic, from Old Calabar on the north to Cape Lopez on the south.

The Calabar bean is the seed of the *Physostigma venenosum* (Balf.), which has been placed by Balfour in the *Leguminosæ*, sub-tribe *Euphaseolæ*, the only tribe of the *Leguminosæ* that contains poisonous plants.

It is a perennial woody climber, attaining sometimes a height of from forty to fifty feet. It twines from right to left round the neighbouring trees, and in spite of any obstacles that may temporarily prevent its progress in this direction, it will after a time resume its course. The leaves are alternate, trifoliate, the middle leaflet ovate, very acute at the tip, regular at the base, stipulate, the lateral leaflets unsymmetrical. There are also two short stipules at the base of the general petiole. The flowers are disposed in clusters, and rose-coloured, with magnificent purple veins. The calyx is unequally five-toothed; the corolla papilionaceous with vexillary æstivation; stamens ten, perigynous and disposed in two fascicles, one consisting of nine stamens, and the other of one vexillary stamen; anthers bilobed, introrse, and dehiscing by two longitudinal slits. The ovary is stipitate and surrounded by a very long style, bearing a globular stigma, the surface of which is slightly hairy and covered with conical papillæ. Immediately below the stigma, on the convex part of the style, is a prominence having the shape of a falcate crest, which Professor Balfour appears to have looked upon as empty and vesicular, and therefore named the genus "*Physostigma*." The author, however, asserts that this prominence is full, and cannot be said in any way to justify the designation. The fruit is a pod $4\frac{1}{4}$ inches to 6 inches long, attenuated at both ends, a little compressed at the sides, bluish in colour; the valves are thickish, striated and rugose on their external surface, and smooth on their internal face, which presents in the intervals between the seeds a sort of whitish cellular tissue. Each pod contains two or three seeds, most commonly two. The seeds, which are the active part of the plant, for neither the leaves nor the stems are poisonous, are oblong, convex, and slightly reniform, a character which is more marked in the beans proceeding from Ogo-wai than in those collected in the neighbourhood of the Como and Rhamboë. They are from one to one and a quarter inches long, and about two thirds of an inch broad. The hilum, which surrounds nearly half the circumference of the bean, has the appearance of a long cicatrice, bounded by a slightly projecting line; is reddish and divided into two equal parts by a furrow that runs its entire length. The external tegument is testaceous, rather rough, and of a chocolate brown colour. In the interior is found a large fleshy embryo, with conical radicle accumbent to the cotyledons, which are ellipsoidal, hard, white, plano, convex, perfectly joined to each other at first, afterwards retracting, and leaving between them an empty space that constitutes a kind of central cavity.

Chemical analysis and microscopical examination have shown that the nucleus is formed of loose cellular tissue, containing large granules of amylaceous matter. These starch grains are oval or reniform, or sometimes assume the form of parallelograms with rounded angles; the margin is sometimes toothed. The spermoderm contains several colouring matters, which have recently been studied by M. Grassi, who thinks they might be utilized in the dyeing of silk. The active principle of the bean is the alkaloid discovered in 1864 by Jobert and Hesse, which has been variously designated physostigmine, calabarine, and eserine, from the name *ésérė* given to the plant by the Cameroons. It is amorphous, brownish-yellow, nearly insoluble in cold water, rather soluble in ammonia, carbonate of soda, ether, benzine, and alcohol. Its solutions in acids are generally deep red, but sometimes intensely blue.

The plant is also called by the Gaboonese *n'Chogo*, and by the Fans, *d'Itounda*. By the last-mentioned people the bruised seeds are made up into an ointment with palm oil, or some other excipient, and used to rid their bodies from the parasites with which they are covered.

TINCTURA OPII.

BY ALLEN SHRYOCK.

Allowing the opium to be wholly exhausted of its active principles, one grain would be represented by $12\frac{8}{10}$ minims of the tincture, according to the U. S. formula; but a minute quantity of morphia has been detected in the residuary matter, so that the tincture is rather weaker than the proportion of opium employed should indicate. To determine this difference, though slight, would be of interest.

Powdered opium was analysed, and found to yield $13\frac{21}{100}$ per cent. of morphia, giving 3171 grains in 50 troy ounces; this quantity being converted into 40 pints of tinctura opii, U. S. P., the dregs of the same were analysed, and found to contain 13 grains of morphia, upon which data we may readily calculate the loss as represented by morphia. Assuming the amount of morphia contained in the powdered opium to be represented nominally by 100 per cent., the amount of morphia retained in the dregs (13 grs.) will be represented by ·40996, or approximately $\frac{2}{5}$ of one per cent. Therefore $12\frac{8}{10}$ minims of tincture of opium in strength equals one grain of powdered opium less $\frac{2}{5}$ per cent., or $\frac{996}{1000}$ gr., and one grain of powdered opium in morphia strength equals $12\frac{85}{100}$ minims.

With this slight difference, however, $12\frac{8}{10}$ minims of the tincture may even represent more than one grain of powdered opium in therapeutic action, though lacking slightly in strength, from the fact of its being in a more diffusible state.

$\frac{66}{100}$ of the opium used was taken up by the menstrum, and each fluid ounce of the tincture contained 4·93 grains of morphia.

The residues left in making galenical preparations are always more or less charged with traces of the active principles. The proper menstrua and mode of preparing them presents a wide and interesting field for investigation.—*Amer. Journ. Pharm.*

TEST FOR ARSENIC IN SULPHURIC ACID.

The presence of arsenic in concentrated sulphuric acid may be detected by cautiously adding drop by drop from 2 to 3 c.c. to a solution of a little stannous chloride in from 4 to 6 c.c. of hydrochloric acid of sp. gr. 1·12, the liquid being gently agitated after each addition. If arsenic be present a yellow colouration changing to brown is produced; if not, the solution remains clear. This test is said to answer if the 500,000th part of arsenious acid be present.—*Dingl. Polyt. Journ.*

THE PROPOSED DINNER AT THE CRYSTAL PALACE.

With the view of affording the members of the Pharmaceutical Society, and old pupils of the School of Pharmacy, who may come to London to attend the Annual Meeting on the 15th May, an opportunity of meeting their fellow-members in the metropolis and other friends, a Public Dinner will take place at the Crystal Palace on Tuesday, the 14th of May, at six P.M.

The PRESIDENT in the chair.

STEWARDS.

Allchin, A., London.	Howden, R., London.
Atherton, J., Nottingham.	Linford, J., London.
Attfield, Professor, London.	Mackay, John, Edinburgh.
Barron, F., London.	Mackey, J. B. London.
Betty, S. C., London.	Martindale, W., London.
Bird, Aug., London.	McCulloch, F., London.
Bottle, Alex., Dover.	Malden, W. W., London.
Bremridge, Elias, London.	Paul, Dr., London.
Barnes, J. B., London.	Preston, Alfred, London.
Bentley, Professor, London.	Redwood, Professor, London.
Brown, W. S., Manchester.	Robbins, John, London.
Bourdas, J., London.	Radley, W. V., Sheffield.
Burden, E., London.	Sandford, G. W., London.
Clift, E., Lewisham.	Savory, C. H., London.
Cracknell, C., London.	Squire, Peter, London.
Darby, Stephen, London.	Squire, William, London.
Davenport, J. T., London.	Shaw, Jno., Liverpool.
Deane, Henry, Clapham.	Smith, E., Torquay.
Down, Dr. Langdon., London.	Stacey, S., London.
Evans, H. S., London.	Stoddart, W. W., Bristol.
Frazer, D., Glasgow.	Schacht, G. F., Clifton.
Gale, S., London.	Southall, W., Birmingham.
Greenish, T., London.	Starkie, R. S., London.
Giles, R. W., Clifton.	Schweitzer, J., Brighton
Hampson, R., London.	Tilden, W. A., D.Sc., London.
Haselden, A. F., London.	Urwick, W. W., London.
Hill, A. B., London.	Wade, Jno., London.
Hills, T. H., London.	Williams, Jno., London.
Hodgkinson, W., London.	Warrick, R. B., London.
Horner, E., London.	Wyman, Jno., London.

Grenadier Guards' Band under the direction of Mr. Dan Godfrey.

Gentlemen willing to act as stewards will oblige by forwarding their names to the Hon. Secretary. Dinner tickets, including wine, one guinea each.

In order to make the necessary arrangements and prevent discomfort, members and *their friends* desirous of being present are requested to apply *at once* for tickets, enclosing a P. O. O. for the amount, to Mr. BREMRIDGE, 17, Bloomsbury Square, W.C., or the Hon. Sec., MICHAEL CARTEIGHE, 172, New Bond Street, London, W.

DILUTION OF GLYCERINE.

In a paper read by Mr. J. P. Remington, before the American Pharmaceutical Association, he called attention to the rise of temperature that occurs when concentrated glycerine is diluted with water, to which circumstance probably were due the irritating properties sometimes attributed to glycerine. He found that upon mixing together equal parts of glycerine, sp. gr. 1·254, and water at a temperature of 77° F., there was an immediate rise of 10° F. One part of water to four parts of glycerine caused a rise of 7° F.; so that when concentrated glycerine is applied to a chapped or ulcerated surface, it absorbs moisture from the skin, and sometimes gives rise to a burning sensation. If a small quantity of water be added to the glycerine before it is applied, this effect is very much mitigated. Professor Parrish bore testimony to the irritating effects sometimes produced by undiluted glycerine, especially in preparations for the eye. He said that he had met with cases where the pharmacist had been charged by the physician with introducing an irritating substance, such as sulphuric acid, for the purpose of dissolving the alkaloid, the fact being that the irritation originated with the glycerine employed.

PRECAUTIONS AGAINST ACCIDENTAL POISONING IN HER MAJESTY'S NAVY.

The following circular, dated 2nd April, 1872, has been issued by the Admiralty to all commanders-in-chief, captains, commanding officers, and medical officers of Her Majesty's ships and vessels, officers in charge of home and foreign hospitals, marine infirmaries (artillery and infantry), medical depôts and surgeries, and governors of Her Majesty's naval prisons:—

1. My Lords Commissioners of the Admiralty are pleased to direct that the following precautions against accidental poisoning be strictly observed on board Her Majesty's ships, and in all naval medical establishments at home and abroad.

2. All medicines or medicinal compounds of a poisonous nature kept in medicine chests or dispensaries are to be put up in bottles or jars of a dark blue colour only, and to bear labels of a yellow colour, having the word 'Poison' printed in bold letters over the name of the medicine.

3. All medicines or medicinal compounds of a harmless nature kept in the chests or in dispensaries are to be put up in bottles of white or pale green glass, or in jars of white ware, and to be distinguished by labels of a green colour.

4. All medicines labelled 'Poison' are to be kept under lock and key, and apart from the others, in the dispensaries ashore and afloat and in the medical stores of hospitals and depôts.

5. All medicines of a poisonous nature, whether for internal or external use, supplied to patients in the wards of hospitals or sick berths of ships are to be labelled with the yellow 'Poison' labels, and put into ribbed or fluted bottles of a dark blue colour only.

In order that this arrangement may be efficiently carried out, all ships and vessels are henceforth to be supplied with double the present numbers of blank yellow poison labels allowed by Scale B; and the stocks of 8-oz. and 4-oz. dark blue ribbed bottles allowed by Scale A are to be increased as follows:—To nine of each in the No. 1 chests, six of each in the No. 2 chests, and four of each in the No. 3 chests.

To gun-boats and coast-guard cruisers on the special scale, 24 blank yellow poison labels and four 4-oz. dark blue ribbed bottles are henceforth to be supplied with the medicine chests for dispensing purposes.

6. Medicines of a harmless character supplied to patients in hospitals or sick berths are to be labelled with green labels and dispensed in bottles of pale green or white glass only.

To ships and vessels double the present numbers of blank green labels allowed by Scale B are henceforth to be supplied; but no addition is at present to be made to the number of white or pale green bottles allowed by Scale A.

To gun-boats and coast-guard cruizers on the special scale, 24 green blank labels are henceforth to be supplied with the medicine chests; but the number of white or pale green 6-oz. E bottles is to be reduced from six to four.

7. No white labels, or labels of any other colours than yellow or green, as specified above, are to be used for medicine bottles or for dispensing; and no other kinds or colours of bottles and jars than those herein named are, under any circumstances, to be used for the purposes specified.

8. These regulations are to be carried into effect at once in all medical establishments, and on board Her Majesty's ships commissioned after this date. On board those ships and vessels now in commission at home or abroad they are to be adopted as soon as practicable, the necessary supplies of bottles and labels being obtainable on demand from the nearest naval medical depôt.

By Command of their Lordships,

VERNON LUSHINGTON.

The Pharmaceutical Journal.

SATURDAY, MAY 11, 1872.

Communications for this Journal, and books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*
Instructions from Members and Associates respecting the transmission of the Journal should be sent to ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*
Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE ANNUAL MEETING, THE ANNIVERSARY DINNER AND THE CONVERSAZIONE.

THE coming week promises to be a busy one for the Pharmaceutical Society of Great Britain, since among the "May meetings" which in London are far more characteristic of the month than the weather that is proverbially associated with its name, three gatherings of special interest to the pharmaceutical body are to take place. First, in order of date, there will be the Dinner at the Crystal Palace on Tuesday, which promises to be a success that will be very gratifying to the feelings of those gentlemen who have promoted it. The list of stewards that they were able to publish last week was eminently a representative one, containing as it did the names of a large majority of the gentlemen constituting the present Council, and of those nominated for the coming election, besides many others which are "household words" amongst us. But this week the list is, if possible, strengthened by the response of several other gentlemen, equally well known and respected. We hope that these favourable auguries may be so far realized as to justify us in the prophetic liberty we have taken of calling it an anniversary dinner.

Ushered in by the Dinner and to be followed by the Conversazione, as though it were intended to drown every possibility of an unpleasant reminiscence, the Annual Meeting will be held at twelve on Wednesday. The Council, following last year's precedent, have forwarded to each member a copy of the Report to be presented at that meeting. Considering the many topics dealt with in this Report, it would be vain to speculate as to the points which will chiefly occupy attention; but it cannot be too strongly pointed out that the annual meeting presents the most legitimate and best opportunity for the discussion of questions of interest to the Trade.

On Wednesday evening the President and Council will receive the guests of the Society at a Conversazione at South Kensington. The pleasant memories connected with past meetings of the kind require only a passing allusion. The band of the Grenadier Guards, under the direction of Mr. DAN GODFREY, will perform a selection of music for the benefit of the promenaders, and an effective glee company will be found in the Lecture Theatre. An ample supply of programmes of the music will be provided gratuitously, and one will be furnished to every visitor upon entering the Museum.

Of course the Annual Meeting can only be attended by those connected with the Society as members and associates in business. But with regard to the other meetings, their catholicity will be best shown by saying that they are equally open to all members of the Trade. All who may wish to attend either the Conversazione or the Dinner will be welcome, and they will be gladly supplied with tickets for the first by Mr. BREMRIDGE, 17, Bloomsbury Square; for the latter by any of the Stewards, Mr. CARTEIGHE, the Honorary Secretary, or Mr. BREMRIDGE.

STATISTICS OF ACCIDENTAL POISONING.

IT has long been the practice in this Journal to report the particulars of any case of poisoning that may from time to time occur, so far as the Society's local secretaries and other friendly correspondents in the provinces are kind enough to furnish the information; and it may be assumed that in this way our pages afford a tolerably ample record of such cases which would be of service in showing the extent to which poisoning is a result of ignorance, carelessness, or mischance on the part of those who sell or dispense drugs of dangerous potency.

Though participating in the hope we believe to be very general, that the disturbing subject of poison regulations may not again be raised, it has been thought desirable to collect together in a tabular form the principle details of all the cases that have been reported in this Journal since the passing of the Pharmacy Act, July 31, 1868, where an alleged negligence or mistake in dispensing or selling drugs has been the subject of a legal enquiry. The time chosen for a starting point appears to be a very natural one, as marking a great change in the conditions under which pharmacy is practised in this country. The list has not been drawn up with the object of favouring any particular opinions, but simply to furnish in a compact and readily available form what we believe to be the best information obtainable upon a point where hitherto speculation has to a great extent done duty for certainty.

As to the source from which the table has been compiled, it may be safely said, without asserting that this Journal records every inquiry into cases of supposed poisoning which takes place throughout the kingdom, that very few escape notice, and certainly none of importance do.

The arrangement of the matter has been carried out so as to appear to the eye in a clear and direct manner. The last column will be found to contain any explanation that has seemed necessary, together

CASES OF DEATH

Date.	Locality.	Reference to Report in Pharm. Journal.	Alleged Cause.	Mistakes in Dispensing.	
				Druggists.	Surgeons, Hospitals and Dispensaries.
1868. August 21	Stratford	x. 181	Baryta	. . . . . .	. . . . . .
—	Manchester	x. 325	Laudanum	. . . . . .	Bottle not sufficiently labelled
—	Bristol	x. 325	Vermin Killer containing strychnia	. . . . . .	. . . . . .
Nov. 9	Stratford	x. 558	Vermin Killer	. . . . . .	. . . . . .
December	Leeds	x. 443	Paregoric	. . . . . .	. . . . . .
1869. Jan. 22...........	Derby	x. 548	Carbolic Acid	. . . . . .	Lotion given for mixture by dispensary nurse.
Feb. 25...........	Gravesend	xi. 45	Strychnia	Dispensed for powdered sugar in teething powder	. . . . . .
May 31...........	St. David's	xi. 44	Strychnia	Supposed to have been supplied by wholesale house for Acetate of Morphia	. . . . . .
June 7	Dublin	xi. 42	Cyanide of Potassium	Porter filled Carb. Ammon. bottle with Cyan. Potass.	. . . . . .
1870. January	London	xi. 727	Wrong medicine	. . . . . .	Opium and castor oil given in mistake.
	Hemyock	xi. 727	Laudanum	. . . . . .	. . . . . .
	Wigan	xi. 728	Strychnia	. . . . . .	Substituted for another drug
May	Stoke	i. 494	Red Precipitate	. . . . . .	. . . . . .
July	Liverpool	i. 93	. . . . . .	. . . . . .	. . . . . .
September	Nottingham	i. 199	Godfrey's Cordial	. . . . . .	. . . . . .
—	Ulverston	i. 239	Carbolic Acid	. . . . . .	. . . . . .
—	London	i. 286	Laudanum?	. . . . . .	. . . . . .
—	Kilmarnock	i. 286	Locock's Wafers	. . . . . .	. . . . . .
October	Worship Street	i. 356	Laudanum	. . . . . .	. . . . . .
—	Cavan	i. 395	Mercurial Powder	. . . . . .	Substituted for Dover's Powder
Nov. 16...........	Redhill	i. 436	Cyanide of Potassium	. . . . . .	. . . . . .
December	Norfolk	i. 536	Vermin Killer containing phosphorus	. . . . . .	. . . . . .
1871. January 18	Mossley	i. 615	Morphia	. . . . . .	Dispensed for Antimony by a youth
„ 23	Macclesfield	i. 657	"Loxham's Cough Mixture"	. . . . . .	. . . . . .
February 18 ...	Manchester	i. 695	Liniment	. . . . . .	Liniment not labelled "poison"
April..............	Counden	i. 856	Wrong powders?	. . . . . .	Sent for a child in mistake
June 5...........	London	ii. 175	Salts of Tartar	. . . . . .	. . . . . .
June 30	Islington	ii. 37	Kino powders	. . . . . .	Given at a dispensary for rhubarb and soda powder
July 13...........	Silkstone	ii. 76	"Soothing Cordial"	. . . . . .	. . . . . .
July 27...........	Aston	ii. 117	Aconite	. . . . . .	Liniment put in a linctus bottle
August	Sidmouth	ii. 138	Morphia	Acetate of Morphia instead of solution	. . . . . .
August 9	London	ii. 257	. . . . . .	. . . . . .	. . . . . .
Sept. 21	Coventry	ii. 276	Laudanum?	. . . . . .	. . . . . .
„ 30	Birkenhead	ii. 298	Laudanum	. . . . . .	. . . . . .
October	Bangor	ii. 317	Carbolic Acid	. . . . . .	. . . . . .
October 24	Carlisle	ii. 355	Syrup of Poppies	. . . . . .	. . . . . .
1872. January 1	Northampton	ii. 618	Laudanum	. . . . . .	. . . . . .
„	Portsmouth	ii. 618	Winslow's Soothing Syrup	. . . . . .	. . . . . .
February 6	Liverpool	ii. 675	Oxalic Acid	. . . . . .	. . . . . .
„ 10......	Dublin	ii. 675	Perchloride of Iron	For Aromatic Iron Mixture	. . . . . .
„ 13......	Caldbeck	ii. 697	Opium	. . . . . .	Misunderstanding between surgeon and messenger
„ 16......	Ayrshire	ii. 817	Salt of Sorrel	. . . . . .	. . . . . .
	Londonderry	ii. 717	Rat poison	. . . . . .	. . . . . .
„ 28......	Oldham	ii. 718	Vermin Killer containing Phosphorus	. . . . . .	. . . . . .
March 18........	Liverpool	ii. 779	Opiate	. . . . . .	. . . . . .
„ 19........	Wandsworth	ii. 794	Mrs. Winslow's Soothing Syrup	. . . . . .	. . . . . .
April 1...........	Leeds	ii. 837	"Compound Essence of Linseed"	. . . . . .	. . . . . .
„ 16........	London	ii. 855	Narcotic	. . . . . .	. . . . . .

OR INJURY.

Mistakes in Sale.		Remarks.
Druggists.	Surgeons, Hospitals and Dispensaries.	
. . . . . .	. . . . . .	Verdict—"Died from effects of baryta accidently sold by Mrs. Hills for flowers of sulphur." Jury thought Mrs. Hills not fit person to keep druggist's shop.
. . . . . .	. . . . . .	Jury censured dispenser for giving out medicines unaccompanied by written directions as to quantity.
. . . . . .	. . . . . .	Open verdict; coroner complaining that while restrictions were placed on sale of strychnia, vermin killers were sold indiscriminately.
. . . . . .	. . . . . .	Suicide by vermin killer containing strychnia.
. . . . . .	. . . . . .	Verdict—Accidental Death.
. . . . . .	. . . . . .	Verdict—"Died from carbolic acid and oi administered in mistake."
. . . . . .	. . . . . .	First day of proprietor in shop. Verdict — "Misadventure," accompanied by a censure for manner in which the poisons were kept.
. . . . . .	. . . . . .	Verdict—Poisoning by misadventure.
. . . . . .	. . . . . .	Druggist censured by jury for want of care.
. . . . . .	. . . . . .	Censure for carelessness.
Sold for Godfrey's Cordial	. . . . . .	Proper bottle broken. Druggist took wrong bottle by mistake; both labelled "poison."
. . . . . .	. . . . . .	Surgeon not aware that crystalline strychnia was in his surgery. Bottle not labelled. Censured by the Jury.
? Sold for Sedlitz Powder	. . . . . .	Verdict for defendant (the druggist).
? Liq. Potassæ instead of Cinnamon Water	. . . . . .	Action against druggist. Verdict, £10 damages.
. . . . . .	. . . . . .	Verdict—"Death accelerated by Godfrey's Cordial." Mother reprimanded.
. . . . . .	. . . . . .	Drunk in mistake for spirit, although labelled "poison."
Sold by a child . .	. . . . . .	Censure of chemist for allowing child to vend poisons.
. . . . . .	. . . . . .	Child died in twelve hours after swallowing some.
. . . . . .	. . . . . .	*Chemist censured by magistrate for sale without witness or previous knowledge of prisoner.*
. . . . . .	. . . . . .	Action for damages. Verdict, £16.
. . . . . .	. . . . . .	Witness censured for signing poison-book without knowing deceased.
. . . . . .	. . . . . .	
. . . . . .	. . . . . .	Verdict—"Misadventure."
. . . . . .	. . . . . .	Over dose taken. Druggist committed for trial on charge of "manslaughter." Mother confessed she had not followed directions.
. . . . . .	. . . . . .	Taken in mistake for a cordial. Verdict—"Accidental death." Surgeon censured for not labelling "poison."
. . . . . .	. . . . . .	Child died. Verdict not recorded.
. . . . . .	Sold for Rochelle Salt.	Action. Damages, one farthing.
. . . . . .	. . . . . .	Verdict—"Over dose of opium through accidental causes."
. . . . . .	. . . . . .	Supplied by an "unqualified practitioner." Verdict—"Accidental death."
. . . . . .	. . . . . .	Surgeon and assistant censured by the jury.
. . . . . .	. . . . . .	Defence—Read "sal" instead of "sol."—Acquitted.
Oxalic Acid labelled "Citrate of Magnesia"	. . . . . .	Fined £5.
. . . . . .	. . . . . .	*Druggist censured by coroner for not registering sale.*
. . . . . .	. . . . . .	Attempted suicide. *Druggist censured by coroner for not registering sale.*
. . . . . .	. . . . . .	*Coroner wished to censure chemist, although the bottle was labelled "poison."* The Jury refused.
. . . . . .	. . . . . .	*Coroner said Syrup Poppies should be labelled "poison."*
. . . . . .	. . . . . .	*Coroner censured druggist for not entering the sale, and jury said a young man twenty years of age was too young to be trusted with poisons.*
. . . . . .	. . . . . .	Verdict,—Death from a narcotic.
. . . . . .	. . . . . .	Attempted poisoning. Supplied at open surgery by person not sober.
. . . . . .	. . . . . .	Attempt to compromise for £20. Action—result not reported.
. . . . . .	. . . . . .	Verdict—"Accidental death."
Sold for Rochelle Salt	. . . . . .	Verdict—"Culpable homicide." Two months' imprisonment.
. . . . . .	. . . . . .	*Fined 2s. 6d. for not entering sale.*
. . . . . .	. . . . . .	*Coroner said sale ought to be registered.* Afterwards retracted.
Dill Water put into Nepenthe bottle	. . . . . .	
. . . . . .	. . . . . .	Verdict—"Died from the effects of the medicine." Jury of opinion that it should have been labelled "poison."
. . . . . .	. . . . . .	
. . . . . .	. . . . . .	Supplied by a hospital porter.

with the result of the inquiry either in the shape of a verdict or magisterial opinion. In this column, in italics, will also be found references to several cases in which officials have censured the conduct of druggists in the sale of poisons, such censure having been itself founded upon an erroneous reading of the Pharmacy Act. As this portion of the question is now under the consideration of the Council, with a view to supply officials with more correct information respecting the Act, these cases will not be without interest.

In placing this table before the readers of this Journal, it is satisfactory to point out the small number of cases in which accidental poisoning was palpably due to ignorance or negligence on the part of druggists—much more frequently it is to the misuse of drugs or medicines by those who have purchased them that disastrous consequences are to be attributed. Again, it is satisfactory to observe so few instances of actual disregard of the provisions of the Pharmacy Act in respect to poisons, and to note that during a period extending back to within a few months after the Act came into operation, there has been an entire absence of any case in which poisoning has been the consequence of mistakes due to defective storage of poisons on the part of druggists.

Transactions of the Pharmaceutical Society.

EXAMINATIONS IN EDINBURGH.

April 30th, 1872.

Present—Messrs. Ainslie, Aitken, Buchanan, Gilmour, Kemp and Young.

Professor Maclagan was also present on behalf of the Privy Council.

MAJOR.

Three candidates presented themselves; of these, *one* failed. The following *two* were declared duly qualified to be registered as pharmaceutical chemists:—

Sant, George................Atherstone.
Henry, James Hay ....Macduff.

The above names are arranged in order of merit.

MINOR.

Nine candidates presented themselves; of these, *two* failed. The following *seven* were declared duly qualified to be registered as chemists and druggists:—

*Young, John..................Edinburgh
*Hilston, David P...............Lanark.
Shearer, John ....Wick.
Gowans, James ....Edinburgh.
Lindsay, Robert ....Lasswade.
Hosie, John ....Aberdeen.
Graham, Alexander ....Leith.

The above names are arranged in order of merit.

MODIFIED.

Four candidates presented themselves; of these, *two* failed. The following *two* were declared qualified to be registered as chemists and druggists:—

Burdon, Thomas A. ....Durham.
McNeil, Margaret ....Glasgow.

* Passed with Honours.

BENEVOLENT FUND.

SUBSCRIPTIONS AND DONATIONS RECEIVED DURING APRIL, 1872.

SUBSCRIPTIONS.

LONDON.

	£.	s.	d.
Andrews, Fredk., 23, Leinster Terrace, W.	0	10	6
Barnard, John, 338, Oxford Street	1	1	0
Bate, Henry, 44, Thorne Road, South Lambeth	0	10	6
Bentley, Professor, 17, Bloomsbury Square	1	1	0
Bradley, John, 5, Brondesbury Terrace, Kilburn	1	1	0
Brown, H. F., 40, Aldersgate Street	0	10	6
Burgoyne, Burbidges, and Co., 16, Coleman Street	2	2	0
Cheetham, W. H., 22, Commerce Place, North Brixton	0	10	6
Coles, Ferdinand, 248, King's Road, S.W.	0	10	6
Constance, Edward, 37, Leadenhall Street	0	10	6
Cooper, Albert, 87, Abingdon Road, Kensington	1	1	0
Davy, Yates, and Routledge, New Park Street	2	2	0
Dewar, M.A., 154, Upper Whitecross Street, E.C.	0	10	6
Dowty, Robert, 6, Tabernacle Row, E.C.	0	2	6
Fox, Wm., 109, Bethnal Green Road, E.	1	1	0
Fripp, P. K., 133, Fenchurch Street, E.C.	1	1	0
Gale, Samuel, 338, Oxford Street	1	1	0
Goodchild, R. S., Well Street, South Hackney	0	5	0
Gulliver, W., 33, Lower Belgrave Street	0	10	6
Hampson, Robt., 205, St. John Street Road, E.C.	1	1	0
Handley, Chas., 2, Vernon Place, Stoke Newington	0	10	6
Hardy, S. C., 338, Oxford Street	0	10	6
Henty, H. M., 19, High Street, St. John's Wood	0	5	0
Herrings and Co., 40, Aldersgate Street	2	2	0
Hickey, E. L., 199, King's Road, Chelsea	0	10	6
Hickley, T. P., 297, Edgware Road	0	10	6
Hill, A. B., 11, Little Britain, E.C.	1	1	0
Hill, A. S., Southfields, Clapham Park, S.W.	1	1	0
Hills, T. H. 338, Oxford Street	3	3	0
Hodsoll, T. W. H., 17, Cross Street, Hoxton	0	10	6
Hora, H. W., 58, Minories, E.	1	1	0
Jones, F. W., 11, Norton Folgate, E.	0	10	6
Jones, Wm, 8, Richmond Terrace, Shepherd's Bush	0	5	0
Kendall, C. F., 126, Clapham Road	0	10	6
King, Henry, 1, Churton Street, Pimlico	1	1	0
Knott, Samuel, 15, Norton Folgate.	0	5	0
Large, J. H., 65, New North Road, N.	0	10	6
McGeorge, Wm., 346, Essex Road	0	10	6
Marks, Henry, 61, Houndsditch	0	10	6
Middleton, Francis, 338, Oxford Street	1	1	0
Mundy, A. O., 11, Norton Folgate, E.	0	10	6
Muskett, A. C., 64, Park Street, Southwark	0	10	6
Nind, Geo., Wandsworth	0	10	6
Palmer, Robt., 35, Ovington Square	1	1	0
Parker, 40, Aldersgate Street	0	10	6
Pratt, E., 8, Upper Berkeley Street, West	1	1	0
Ralph, T. P., 11, Great Quebec Street, Marylebone	0	10	6
Roberts, Peter, 6, Suffolk Lane, Upper Thames Street	0	10	6
Sadler, Wm., 15, Norton Folgate	0	10	6
Salter, F. S., 87, Mount Street, Grosvenor Square	1	1	0
Sangster, A., 60, High Street, St. John's Wood	1	1	0
Saul, W. B., 30, Conduit Street, W.	0	10	6
Simpson, H., 5, Hanover Place, Regent's Park	0	10	6
Smith, Wm., 2, Alfred Terrace, South Hackney	0	10	6
Steer, P. R., 411, Mare Street, Hackney	0	10	6
Thorn, J. J., 338, Oxford Street	0	5	0
Tipping, T. J. W., 12, High Street, Stoke Newington	0	10	6
Townsend, Chas., 40, Aldersgate Street	0	10	6
Tuck, W. H., 630, Mile End Road, E.	0	10	6
Umney, Chas., 40, Aldersgate Street	0	10	6
Whittle, E. C. C., Townshend Road, St. John's Wood	0	5	0
Wigg, Henry J., 338, Oxford Street	0	10	6
Williams, J. J., 13, Desboro Place, Harrow Road	0	10	6
Wootton, Wm., 33, Liverpool Road, N.	0	10	6
Wretts, J. R., 338, Oxford Street	0	5	0
Young, G., 12, Ebenezer Terrace, Millwall	0	5	0

COUNTRY.

	£.	s.	d.
Abergavenny, Ackrill, George	0	10	6
Alnwick, Newbigin, J. L.	0	10	6
Ashton-under-Lyne, Bostock, W., 241, Stamford Street	0	10	6
Bath, Merrikin, J. B.	0	5	0
,, Pooley, J. C.	0	5	0
,, Tylee, J. P.	0	10	6
Barnstaple, Goss, S.	0	7	6
Banff, Ellis, B.	0	10	6
Bangor, Pickering, I.	0	10	6
Beckenham, Day, T. S.	0	10	6
Birmingham, Churchill, J.	0	10	6
,, Clayton, F. C.	1	1	0
,, Perry, W. H., 52, Ryland Street, North	0	5	0
,, Pegg, H.	0	10	6
,, Snape, J. G.	0	5	0
,, Southall, Son and Dymond.	1	1	0
Bishop Auckland, Peverell, H.	0	10	6
,, Peverell, R.	0	10	6
Blackley, Lancs., Boden, Benjamin.	0	5	0
Bognor, Long, A. T.	0	10	6

	£	s.	d.
Boston, Allen T.	0	5	0
,, Marshall, R.	0	5	0
Bewdley, Newman, R.	0	10	6
Bradford, Harrison and Parkinson	2	2	0
,, Hick, J.	0	10	6
,, Rogerson and Son	2	2	0
,, Walker, J.	0	10	6
Bridge, Thomas, James.	0	5	0
Bridport, Beach and Barnicott	1	1	0
,, Beach, J.	0	10	6
,, Tucker, C.	0	10	6
Bridlington Quay, Cooper, M. W.	0	5	0
,, Dickins, John	0	2	6
,, Smith, John	0	1	0
Brighton, Barton, C.	0	10	6
,, Barton, H.	0	10	6
,, Brew, T. A., 71, East Street	0	10	6
,, Cornish, W., 174, Western Road	0	5	0
,, Else, W., 52, King's Road	0	10	6
,, Foster, F., 52, King's Road	0	10	6
,, Gwatkin, J. T., 49, Grand Parade	0	10	6
,, Glaisyer, T., 11, North Street	0	10	6
,, Haffenden, T., 46, Dyke Road.	0	10	0
,, Kemp, J., 11, North Street	0	10	6
Bristol, Butler, S.	0	10	6
,, Hatch, Isaacs and Co.	1	1	0
,, Hodder, H., Broad Street	0	5	0
,, Margetson, J., 42, Old Market Street	0	10	6
,, Sircom, R.	0	10	6
,, Stoddart, W. W., 9, North Street	0	10	6
Bromley, Baxter, W. W.	0	10	6
,, Shillcock, J. B.	0	10	6
Burslem, Guest, G. C.	0	2	6
Bruton, Hill, Richard	0	5	0
Buxton, Barnet, A.	0	10	6
Cambridge, Deck, A.	0	10	6
Canterbury, Gardner, A. W.	0	5	0
Carlisle, Todd, J.	0	5	0
Castlebar (Co. Mayo), Divors, H. J.	0	10	0
Cheltenham, Beetham, M.	1	1	0
,, From Chemists and Assistant Chemists	6	16	0
,, Street, Mrs.	0	10	6
Chertsey, Boyce, G.	0	5	0
Cirencester, Skinner, T.	0	10	6
Crewkerne, Pearce, J.	0	5	0
Crook, Wilson, I.	0	10	6
Darlington, Abbott, J. T.	0	5	0
Diss, Gostling, T. P.	0	10	6
,, Smith, T. W.	0	5	0
Dover, Bottle, A.	1	1	0
,, Forster, R.	0	10	6
,, Forster, R. H.	0	5	0
,, Hambrook, J. B.	0	5	0
Doncaster, Walker, E. H.	0	10	6
Dudley, Dennison, M.	0	5	0
,, Hollier, E.	0	10	6
Dundee, Lawson, A.	0	5	0
Edinburgh, Ainslie, Wm.	0	10	6
,, Aitken, J.	0	5	0
,, Brown, R. S.	0	5	0
,, Buchanan, James	1	1	0
,, Duncan, Flockhart and Co.	1	1	0
,, Gardner, James	0	10	6
,, Macfarlane and Co.	2	2	0
,, Macfarlane, A. Y.	0	5	0
,, Mackay, J.	1	1	0
Exeter, Cooper, G.	0	10	6
,, Husband, M.	0	10	6
,, Napier, G. L.	0	5	0
,, Stone J.	0	5	0
Falkirk, Murdoch, D.	0	10	6
Faringdon, Berks., Ballard, A.	0	10	6
Fordingbridge, Haydon, F. W.	0	5	0
Frodsham, Harvey, Simpson	0	5	0
Gateshead-on-Tyne, Garbutt, C. D.	0	10	6
Glasgow, Currie, J.	0	5	0
,, Fairlie, J. M.	0	5	0
,, Frazer, D.	1	1	0
,, Harrower, P.	0	5	0
,, Kinninmont, A.	0	10	6
,, Murdock Brothers.	0	10	6
Gloucester, Stafford, W.	0	10	6
Grantham, Hall, T.	0	10	6
Gravesend, Dismorr, H.	0	10	6
Gosport, Hunter J.	0	5	0
,, Mumby, C.	0	10	6
Hadfield, Jones, James	0	5	0
Harrogate, Coupland, J.	0	10	6
,, Davis, R. H.	0	5	0
,, Greenwood, C.	0	5	6
,, Taylor, J. H.	0	10	6
Hastings, Bell, J. A.	0	10	6
,, Rossiter, F.	0	10	6
Haverfordwest, Saunders, D. P.	0	10	6
Hawkhurst, Stainburn, J.	1	1	0
Hay, Davies, J. L.	0	5	0
Heavitree, (near Exeter), Brailey, C.	0	5	0

	£	s.	d.
Heywood, Beckett, W.	0	10	6
Horsham, Gull, T.	1	1	0
Huddersfield, Fryer, H.	0	10	6
,, Higgins, T. S.	0	10	6
,, King, W.	0	10	6
,, Lee, D.	0	10	6
Hull, Allison Brothers	1	1	0
,, Anholm, A.	0	10	6
,, Barlow, G.	0	5	0
,, Baynes, J.	0	10	6
,, Bell, C. B.	0	10	6
,, Brigg, E. J.	0	5	0
,, Balk and Shepherdson	0	5	0
,, DesForges, J. H.	0	5	0
,, Dixon, J.	0	5	0
,, Dobson, J. B.	0	5	0
,, Dyson, G.	0	5	0
,, Earle, F.	1	11	6
,, Escreet, J.	0	5	0
,, Fisher, R.	0	5	0
,, Gibson, C. P.	0	10	6
,, Green, A.	0	5	0
,, Hall, H. R. F.	0	5	0
,, Hart, G.	0	10	6
,, Hammond, C.	0	10	6
,, Hutchinson, J. C.	0	5	0
,, Kirton, J. B.	0	10	6
,, Milner, J. G.	0	5	0
,, Myers, G., and Co.	0	10	6
,, Shaw, W.	0	5	0
,, Smith, A.	0	10	6
,, Soutter, J. S.	0	10	0
,, Stanning, W.	0	5	0
,, Wokes, G.	0	5	0
Hulme, Ritson, John	0	5	0
Hyde, Grime, J.	0	2	6
Jedburgh, Rawdin, J.	0	5	0
Jersey, Millais, Thomas	1	1	0
Kidderminster, Bond, C.	0	10	6
Kimbolton, Gudgen, G. B.	0	5	0
Leamington, Barnitt J.	0	10	6
,, Cutting, J.	0	10	6
,, Davis, H.	0	10	6
,, Jones S. U.	0	10	6
,, Leath and Woolcott	0	10	6
,, Pullin, W. H.	0	10	6
,, Wright, W. F.	0	10	6
Lewes, Briscoe, C.	0	5	0
Liverpool, Clay and Abraham	1	1	0
,, Fergusson, J.	1	1	0
,, Holt, S.	0	1	0
,, Hunt, T.	0	10	6
,, Jones, O. L.	1	1	0
,, Jones, W.	0	5	0
,, Kennerley, W.	0	2	6
,, Morris, T. E.	1	1	0
,, Parkinson, R.	0	10	6
,, Tanner, A. E.	0	10	6
Llangollen, H. Jones	0	5	0
Looe, Hicks, J. S.	0	10	6
Louth, Hurst, J.	0	10	6
,, Hurst, J. B.	0	10	6
Leatherhead, Hewlins, E.	0	10	6
Leeds, Bilborough, J. B.	0	10	6
,, Brooke, T.	0	10	6
,, Goodall, Backhouse and Co.	1	1	0
,, Harvey, T.	1	1	0
,, Hirst, J. A.	0	10	6
,, Jefferson, P.	0	5	0
,, Reynolds, R.	1	1	0
,, Reynolds, F.	0	10	6
,, Sagar, H.	0	5	0
,, Smeaton, W.	0	10	6
,, Taylor and Fletcher	1	1	0
,, Yewdall, E.	0	10	6
Ludlow, Cocking, Geo.	0	5	0
,, Foster, Edw.	0	5	0
,, Grieves, H.	0	5	0
,, Marston, A.	0	10	0
,, Nickson, J.	0	5	0
Lymington, Allen, A. U.	0	5	0
Manchester, F. Baden Benger	0	5	0
,, Carter, W.	0	10	6
,, Jackson, T.	0	10	6
,, Manfield, J. W.	0	5	0
,, Maunder, R.	0	10	6
,, Mumbray, H. G.	0	10	6
,, Terry, T.	0	5	0
,, Walsh, E.	0	10	6
,, West, T.	0	5	0
,, Wilkinson, G.	0	10	6
,, Wright and Barnaby	1	1	0
Malvern, Metcalfe, E. H.	0	10	6
Malvern Link, Gwillim, J. C.	0	10	6
Matlock Green, Clay, Francis	0	5	0
Melton Mowbray, Leadbetter, W. A.	0	5	0
Middlesboro-on-Tees, Taylor, H. H.	0	10	6

	£.	s.	d.
Middlesboro-on-Tees, Taylor, W. J.	0	10	6
Minehead, Bond, E.	0	5	0
New Barnet, Young, R. F.	0	10	6
Newcastle-on-Tyne, Brady, H. B.	1	1	0
,, Hall, T.	0	10	6
Newton, Morgan, Richard	0	10	6
Norwich, Caley, A. J.	0	10	6
,, Sutton, Francis	0	10	6
Nottingham, Jackson, R.	0	5	0
Ramsgate, Balch, E.	0	5	0
,, Morton, H.	0	5	0
Reading, Bradley and Bliss	0	10	6
,, Dowling, R.	0	5	0
,, Hayward, W. G.	0	5	0
,, Ridley, C. H.	0	5	0
,, Timothy, J. N.	0	5	0
,, Tunbridge, F.	0	5	0
Retford, Baker, William	0	10	6
Rhyl, Jones, E. P.	0	10	6
Richmond, (*Yorks.*), Thompson, T.	0	10	6
Ryde, Dixon, Henry	0	10	6
,, Gibbs, W.	0	10	6
,, Taylor, R.	0	10	6
,, Wavell, John.	0	10	6
Oakham, Wellington, J. M.	0	10	6
Oldham, Bagshaw, W.	0	10	6
,, Bates, H.	0	10	6
,, Berry, T.	0	5	0
,, Braddock, G.	0	10	6
,, Braddock, J.	0	5	0
,, Eckersley, James	0	5	0
,, Geddes, W.	0	5	0
,, Goodall, F.	0	10	6
,, Hargraves, H. L.	0	10	6
,, Henthorn, J.	0	10	6
,, Hulme, J.	0	5	0
,, Jackson, J. T.	0	5	0
,, Lord, R.	0	5	0
,, Massey, J.	0	5	0
,, Myott, W.	0	5	0
,, Wild, David	0	5	0
,, Wild, W.	0	5	0
,, Wharton, F.	0	10	6
,, Wrigley, W.	0	5	0
Oswestry, Turner, W. H.	0	4	0
,, Vaughan, D.	0	10	6
Oxford, Houghton, T.	0	10	6
,, Prior, G. T.	0	10	6
Partick, Rait, R. C.	0	7	6
Plaistow, Potter, W. S.	0	2	6
Plymouth, Balkwill, A. P.	0	10	6
,, Northcroft, J.	0	5	0
,, Sloggett, T. C.	0	2	6
Portobello, Kemp, D.	0	10	6
Preston, Hogarth, W.	0	10	6
,, Houghton, W.	0	10	6
,, Mason, H. C.	0	10	6
Richmond, Clarke, T. M.	0	10	6
St. Albans, Martin, H. G.	0	10	6
,, Roberts, A.	1	1	0
St. Andrews, Govan, A.	1	1	0
St. Clears, Williams, E.	0	10	6
Salisbury, Atkins, S. R.	0	10	6
Saltash, Mathew, W. H.	0	4	0
Shrewsbury, Blunt, Son, and Co.	1	1	0
,, Cross, W. G.	0	10	6
,, Cross, W. G., jun.	0	10	6
,, Edwards, W.	0	10	6
,, Salter, J. B.	0	10	6
Southsea, Cruse, T. H.	0	10	6
South Shields, Forrest, R.	0	10	0
,, Hudson, T.	0	5	0
,, Mays, R. J. J.	0	10	6
,, Noble, J.	0	5	0
,, Riddle, J.	0	5	0
,, Rowell, R.	0	2	6
,, Smith, E. B.	0	5	0
Spalding, Asling, B.	0	5	0
Steyning, Goodwin, C. S.	0	5	0
Stourbridge, Bland, J. H.	0	10	6
,, Burgess, W.	0	5	0
,, Hughes, S.	0	10	6
,, Jones, R. G.	0	5	0
,, Loverock, H.	0	5	0
,, Morris, A. P.	0	10	6
,, Perks, F.	0	10	6
,, Whitwell, G.	0	5	0
Stowmarket, Simpson, T., and Son	0	5	0
,, Sutton, C. W.	0	5	0
Stafford, Averill, J.	1	1	0
,, Averill, H. A.	1	1	0
Stratford (Essex), Holford, T. C.	0	10	6
Stroud, Coley, S. J.	0	10	6
Swaffham, Baker, P. C.	0	5	0
Stamford, Dickinson, F.	0	10	6
,, Patterson, G.	0	10	6
,, Provost, W.	0	5	0

	£.	s.	d.
Stamford, Rees, T. G.,	0	5	0
Selby, Burton, J.	0	2	6
,, Colton, Thos.	0	2	6
,, Cutting, T. J.	0	2	6
,, Glew, W.	0	2	6
Shaftesbury, Powell, J.	0	5	0
Sheffield, Ellinor, G.	0	10	6
,, Jennings, J. E. H.	0	10	6
,, Maleham, H.	0	10	6
,, Priestley, H.	0	10	6
,, Radley, W. V.	0	10	6
,, Wilson, E.	0	10	6
Sutton Coldfield, Smith, W.	0	10	6
Taunton, Fouracre, R.	0	10	6
,, Gregory, G. H.	0	5	0
,, Grose, N. M.	0	10	6
,, Hambly, C. J.	0	10	6
,, Kirkpatrick, S.	0	5	0
,, Prince, Henry	0	10	6
,, Redman, S.	0	5	0
Trimpley, near Bewdley, Steward, J.	0	10	6
,, Steward, T.	0	10	6
Todmorden, Lord, C.	1	1	0
Torpoint, Down, R. H.	0	10	6
Tottenham, Bentley, W. J.	0	10	6
Tunbridge Wells, Cheverton, G.	0	10	6
,, Gardener, C.	0	10	6
,, Howard, R.	0	10	6
,, Wright, W. J.	0	5	0
Uttoxeter, Johnson, J. B.	0	10	6
Ventnor (I. W.), Smith, J. C.	0	10	6
Wakefield, Chaplin, J. L.	0	10	6
,, Duffin, T.	0	10	6
,, Romans, T. W.	0	10	6
,, Taylor, J.	0	10	6
Watford, Oldfield, H.	0	10	6
Weaverham (Cheshire), Manifold, J. J.	0	10	6
Wellington, Langford, J. B.	0	10	0
West Hartlepool, Davison, J.	2	2	0
Woodbridge, Betts, J.	0	10	6
Woolwich, Parkes, J. C.	0	10	6
,, Rastrick, J. A.	0	10	6
Worcester, Burrows, Messrs.	1	1	0
,, George and Welsh	1	1	0
,, Whitfield and Son	1	1	0
,, Witherington, T.	1	1	0
Wymondham, Skoulding, W.	0	5	0

Provincial Transactions.

LEEDS CHEMISTS' ASSOCIATION.

The sixth meeting of this Society was held in the Library, on Wednesday, April 10th, 1872; the President, Mr. E. BROWN, in the chair.

The minutes of the former meeting having been read and confirmed, Mr. S. JEFFERSON, F.C.S., gave a very interesting lecture on oxidation, illustrated by experiments.

A cordial vote of thanks was given to the lecturer on the motion of Mr. JAS. ABBOTT, seconded by Mr. WEST, Associate.

The seventh meeting was held in the Clergy Room, Church Institute, on Wednesday, April 24th; the President, Mr. E. BROWN, in the chair.

The minutes of the former meeting having been read and confirmed, Messrs. J. P. Hardcastle, W. T. Place, William Sykes, J. Lockwood, E. Battye, and A. Burton, were elected associates.

The PRESIDENT requested the Honorary Secretary, Mr. E. YEWDALL, to read the report of the Committee, referring to the prizes offered at the early part of the Session. This report explained that the Committee were enabled to offer Bentley's 'Manual of Botany,' and Attfield's Chemistry, or two other works of similar value for the best essays upon "Cinchona Barks—the history, varieties, preparations of, and Alkaloids obtained from;" and "The preparations of iron, officinal and non-officinal." Also Lindley's 'School Botany,' and Galloway's 'First Steps in Chemistry,' or two other works of equal value for the two best papers upon "Rhubarb, the history and preparations of;" and "Magnesia and its officinal preparations."

The essays were to be compiled and written by Associates, the last two subjects being confined to associates under 21 years of age.

Six essays were received, and the Committee was pleased to find in Mr. Schacht, of Clifton, an agreeable collaborator, to whom the essays were forwarded for examination. Mr. Schacht's report upon the merits of each paper was readily accepted by the Committee, and the prizes awarded as follows:—

Cinchona Barks..........Mr. West.
The preparations of Iron...Mr. F. Walbran.
Rhubarb................Mr. G. S. Highmoor.
Magnesia...............Mr. C. Smith.

The essay upon Cinchona Barks and the preparations of Iron were then read by their respective authors.

A discussion then took place as to the course to be adopted with reference to the other essays, the lateness of the hour preventing their being read, when it was resolved that the meeting be adjourned.

Before the adjournment the PRESIDENT presented the prizes to each successful essayist, with some very appropriate remarks.

Mr. SMEETON proposed that the thanks of the Society be given to Messrs. Harvey and Reynolds, and J. Day and E. Yewdall for their kind donation of the books just given as prizes, which was seconded by Mr. WILSON, Associate, and carried unanimously.

The meeting was then adjourned to Wednesday, May 1st.

The adjourned meeting was held in the Clergy Room, Church Institute, on Wednesday, May 1st; Mr. E. S. PAYNE, Associate, in the chair.

The Honorary SECRETARY read a letter received from Mr. Radley, of Sheffield, respecting Provincial Pharmaceutical Education, after which Mr. PAYNE, Curator, called attention to specimens of crude and refined ozokerite, tincal or native borax, and apatite, presented to the Museum by Mr. Reynolds; after which Mr. G. S. HIGHMOOR, Associate, read his essay upon "Rhubarb, the history and preparations of."

Mr. C. SMITH, Associate, also read his essay upon "Magnesia and its officinal preparations."

The PRESIDENT, who had entered the room during the reading of the last paper, explained that a letter addressed to him was an apology from Mr. Reynolds, who was prevented by another engagement from being present.

The CHAIRMAN announced that this was the concluding meeting of the present Session.

LIVERPOOL CHEMISTS' ASSOCIATION.

The twelfth General Meeting was held at the Royal Institution on Thursday evening, the 25th April; the President, Mr. E. DAVIES, F.C.S., in the chair.

Mr. T. F. ABRAHAM, on behalf of Messrs. Herrings, of London, presented a specimen of Natal aloes for the museum. Several donations to the library were also announced.

Dr. SYMES made some remarks on the desirability of pharmacists making their own preparations,—not with a view to profit, as wholesale houses working on a large scale would always be able to produce their preparations much cheaper than when made in smaller quantities, but as a means of instruction for those learning and engaged in the business.

The Hon. Secretary, Mr. J. HALLAWELL, then read a paper on

CHEMISTRY AND PHARMACY IN BRAZIL.

He said that although chemistry was worthily represented in two or three of the principal cities of Brazil, by medical men, and those connected with the universities and medical schools, yet everywhere practical or applied chemistry was in its veriest infancy, and could hardly be said to exist. Referring to the southern provinces in which he had resided many years, he said that a larger or more profitable field for a practical chemist did not exist anywhere; for, while in the large slaughter-houses the waste of valuable material was great, the means of collecting and utilizing it on a large scale were most easy. Materials of all kinds are abundant and cheap, and the high duties paid on imported articles offer a large profit to any manufacturer. As an instance of the ease with which waste could be collected, he stated that in some slaughter-yards a great number of vats were worked, in which the bones were macerated in order to extract the grease. The gelatine, however, runs off down a trough right away into the river and is lost; about a hundredweight being thus thrown away from each vat every two days. By simply diverting the trough into cisterns several tons could be collected *per diem* without the least expenditure of labour. Its subsequent preparation for manufacture or export would be easy. This was, however, one of the least valuable of the wasted products, and only served as an illustration. Much of the beef was salted and dried, and shipped to the northern ports for food; but very often the whole carcass of the ox was thrown into the vats, for the sake of extracting the grease, the flesh being entirely lost. There had been many objections made against the process of preserving meat in use in Australia, though no doubt about the best hitherto adopted; but a good process, presenting the beef in a more acceptable form to the buyer in Europe, would be a great boon, and would be a profitable enterprise.

He mentioned that some years ago Dr. Ubatuba, Inspector of Public Health for Rio Grande, had commenced the manufacture of extract of meat. For various reasons he had only been able to make it on a small scale, but now he was extending his plant, and hoped to be able to produce it in considerable quantity. This extract had been awarded the gold medal for its excellence and superior quality by the jurors of the Workmen's International Exhibition, held in London in 1870. Messrs. Leâo and Alves, two enterprising Brazilians, had also some years ago established a factory at Porto Alegro, for pressing oils, and they had been most successful. Nearly all the castor oil used in the province was now pressed by them, from seeds grown almost on the spot; and they had added little by little to their establishment, until it had become a very large one, and a large quantity of other oils, as neats-foot, linseed, rape, and many other vegetable oils unknown here in general use, but used there by the pharmacist and for illumination, are now regularly produced by them. These gentlemen had been aided by the Brazilian Government, which was always willing to help private enterprise by advancing money at a low interest; and this willingness to assist, after many instances of failure on the part of those helped, is most noteworthy.

Passing on to pharmacy, Mr. Hallawell stated that there were two medical schools or colleges in Brazil; one in the city of Rio de Janeiro, another at Bahia. The studies and privileges of both were the same. A student in pharmacy usually, after spending a few years in service in some retail establishment, goes up to the school at one of these two places, and there he must study two years. The course of study is almost the same as that adopted in Bloomsbury Square, and the examinations likewise. After a satisfactory examination he is granted a diploma, and may begin business as a pharmacist when and where he likes; for, like England, in Brazil there is no limit placed on the number of pharmacies. A pharmacist is called a 'Boticario;' he is exempt from serving on juries, or in the National Guard, but he cannot engage in any other business, nor have more than one pharmacy. By law medical men are forbidden to dispense their own medicines; there is therefore plenty for the pharmacist to do; and while they sometimes encroach upon the province of the doctor by prescribing for casual and common complaints, they are protected by law from being encroached upon by the doctor.

Prescriptions are written in Portuguese, the language of the country, and are not copied into a book, but written upon the label of each mixture, lotion, or box of pills. This involves labels, and consequently pill-boxes of a much larger size than those used in this country. The prescription is usually retained until the amount incurred by the patient has been paid, meanwhile serving as a sort of memorandum, each repetition of the medicine being marked upon it; it is then handed over to the owner, a receipt in full of all demands. The hours of working are very long, pharmacies generally opening at six in the morning and not closing before nine or ten at night. They are open all Sundays and holidays in most places.

The law requiring two years of study is relaxed in the case of foreigners coming from other countries to Brazil, and who bring with them an accredited diploma, or other proof of qualification from the school, college, or university, where they have resided. In this case an examination like our modified one, is made; it is called an examination of competency; and it is divided in two parts, theoretical and practical. The first is made partly by written questions, partly *vivâ voce*, and if the examiners are satisfied with the answers, the candidate goes on to the practical one, where he is required to make one or two analyses, prepare from memory one or more pharmaceutical preparations or formula, detect the presence of some adulterations in one or more substances, and recognize those in the collection of Materia Medica, and finally dispense one or more prescriptions. If this is also satisfactory, his diploma is endorsed, and he may also begin business when and where he may please in the empire.

The charges for medicine varies much with the locality; the average would perhaps be about double those charged in a first-class pharmacy in England.

Patent medicines and specialities are very largely used; many of those approved by the academies of medicine in Paris and elsewhere being prescribed by the physicians, such as, for instance, the pills of Vallet or Blancard or other accredited preparation. One excellent regulation exists, no patent medicine is allowed to be advertised in the newspapers, unless the formula has been submitted to and approved by the Imperial School of Medicine. This law is evaded in some of the smaller towns, but it is rigorously observed in the principal cities.

The Pharmacopœia recognized in Brazil is the formula of Dr. Chernoviz, a compilation from most European Pharmacopœias, but chiefly from the French codex.

Samples of the extract of beef alluded to, made by Dr. Ubatuba were shown, and the preparation was found to be very good indeed, the flavour of the beef being admirably preserved.

Oils and other products made by Messrs. Leão and Alves were shown and found well made, and several other preparations which Mr. Hallawell brought for inspection were examined with interest.

A vote of thanks to the Hon. Secretary, moved by Dr. Symes, seconded by Mr. Davies, terminated the proceedings.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

Thursday, May 2nd, 1872. Dr. Frankland, F.R.S., President, in the chair.

When the minutes of the previous meeting had been read and confirmed, the President called on Mr. E. Riley to deliver his lecture "On the Manufacture of Iron and Steel." The lecturer in his discourse treated principally of the elements associated with iron in the pig, and the part they play in the subsequent conversion of the pig into wrought iron and steel. After describing the composition of the principal varieties of pig, he considered the effect of the presence of the elements carbon, sulphur, phosphorus and silicon in various proportions, remarking that the carbon, and perhaps the silicon, do not seem to be chemically combined with the iron in the pig, but simply to be diffused through the mass. In conclusion the author described the process of puddling by machinery, with especial reference to Mr. Dank's machine.

This able and exhaustive memoir was copiously illustrated by analyses.

After an animated discussion the meeting adjourned until Thursday, 16th May.

Eight communications were announced for the next meeting.

Parliamentary and Law Proceedings.

HOUSE OF COMMONS.

Monday, May 6th.

Public Health Bills.

The Committees on the Public Health Bill, and the Public Health and Local Government Bill were deferred till Monday next. In reply, however, to a question put by Lord R. Montagu, on Tuesday night,

Mr. Gladstone said that the Public Health Bill would not be taken at the first order on the Monday after the holidays, as it was the custom to take Supply on that night.

Wednesday, May 8th.

Juries Bill.

The second reading of the Juries Bill was put off till Monday next.

Alleged Poisoning by a Vermin Killer Containing Strychnine.

An adjourned inquest was held on Saturday, April 24, at Newton Moor, Manchester, to inquire into the circumstances attending the death of a married woman named Hickling. It appeared that on the 12th ult. the deceased feeling unwell, her husband, at her request, procured for her a worm-powder from Mr. Brunt, druggist. After she had taken the medicine, with castor-oil, she was seized with tetanic convulsions and died in half an hour. The husband afterwards went to the Manchester Infirmary, where deceased had been an out-patient, and applied for a certificate of death, saying that his wife, while sitting up in bed, had suddenly become faint and died. An inquiry having been instituted, and a *post-mortem* examination ordered to be made by Dr. Beecroft, that gentleman was convinced that the death had resulted from poison. The contents of the stomach and liver were, therefore, placed in sealed jars, and sent to Professor Crace-Calvert for analysis.

Professor Frederick Crace-Calvert said he received the jars mentioned, and examined the contents. He analysed a portion of the contents of a glass bottle containing *kousso*, and found it genuine. It contained no strychnine. He tested for strychnine, but it did not contain any. He then opened the jar containing the stomach and its contents, and analysed them specially for strychnine, of which he found (for strychnine) a large quantity. The evidences of strychnine were unmistakable. What he found in the stomach was quite sufficient to account for death. Professor Calvert here said he thought it would be an advantage, as this poison was used very frequently, and as it was very difficult to detect, if he stated the means he had employed in its detection in this case, as it might be of advantage to medical men. It was a method he had himself discovered, and he had adopted it several times before with success. The process consists in boiling the contents of the stomach with a small quantity of sulphuric and hydrochloric acids. The whole is concentrated and thoroughly mixed with an equal volume of chloroform by agitation, and allowed to stand. The chloroform which separates contains nearly the whole of the strychnine (or most of the other alkaloids) present in the contents of the stomach. The chloroform solution is mixed with a little hydrochloric acid, and evaporated nearly to dryness. The residue is then dissolved in water, and placed to dialyse. To still further isolate the strychnine from impurities, the dialysed liquor is evaporated nearly to dryness, and mixed with a little caustic potash and chloroform, when the latter dissolves the strychnine, which is obtained in a state of purity on evaporating the chloroform. A very nice modification of the application of the bichromate of potash test, proposed by Otto, consists in adding to the strychnine a cold saturated solution of the bichromate, when a yellow crystalline precipitate is produced. The excess of bichromate is then washed carefully away, and concentrated sulphuric acid is produced, which has a far greater permanence than that obtained by the usual method.

Evidence was also given by a little boy that, about the time the deceased's husband was known to be in Hyde, on the same evening the woman died, a man dressed in similar clothes to those the husband had on met him in the street, and sent him to the shop of Mr. Oldfield, druggist, for three vermin powders.

Henry Oldfield said he was a chemist and druggist, and resided at Hyde. He manufactured vermin destroyers—a powder. Each powder contained about a grain and a half of strychnine. The other portions are composed chiefly of starch powder and blue colour. He was in the shop all the evening when the witness said he bought these packets, but he had no recollection of seeing him. Every packet containing the vermin killer was labelled "poison" in three or four places, and they were charged threepence each.

The jury returned a verdict of wilful murder against the husband, and the coroner committed him for trial at the Chester assizes.

On the following Monday, the prisoner was brought up before the magistrates. The evidence was substantially the same as that given before the coroner. Mr. Oldfield stated in addition that he formerly registered the sale of these powders; but, in consequence of a difference of opinion as to whether it was necessary or not, he gave over doing so, and was not registering them on the 12th of April. He did now, however, register them.

The prisoner was committed for trial on a charge of wilful murder.

The following correspondence on the above subject has during the week appeared in the *Manchester Courier*:—

Sir,—I believe our law has imposed certain important restrictions on the sale of poisons. If that be so, has there not been an evasion or disregard of its provisions in connection with the death of Mrs. Hickling, of Newton? Your report of the adjourned inquest stated that "evidence was called to prove that about two hours before the woman's death the husband was in Hyde, and sent a lad to purchase three vermin powders at a chemist's shop, for which he paid ninepence. Each of those powders contained a grain and a half of strychnine." I think you will agree with me that a very important question is involved in the correctness or otherwise of my impression, and I should like to be satisfied on the subject. I trust you will accept that desire as sufficient apology for troubling you.—Yours, etc.,

JUSTICE.

Manchester, April 29th.

Sir,—In reply to your correspondent "Justice," I wish to say that by the "Sale of Poisons Act" a number of articles specified as "poisons" and enumerated in a schedule are not allowed to be sold except under certain conditions. This schedule is divided into two parts; the articles in the first part, in which strychnia is included, being of a more dangerous nature, are not to be sold unless the sale be registered in a book kept for that purpose, and the entry signed by the purchaser, who must either be known to the seller or introduced by some one known to him, who must in that case also sign the book. The articles in the second part of the schedule being of a less dangerous nature do not require registration, but must be labelled with the name of the article, the word "poison," and the name and address of the vendor. Now in this second part of the schedule we find "vermin killers (every compound containing a 'poison,' and sold for the destruction of vermin)." I conceive, therefore, that if the druggist who sold the vermin powder in the case mentioned put his name and address on each packet, he has neither evaded nor disregarded the provisions of the Act.—Yours, etc.,

W. WILKINSON.

263, *Cheetham Hill, Manchester, April* 30*th*.

Sir,—I thank Mr. Wilkinson for the information he has kindly given on the subject of the sale of poisons; but he omits mention of the very question which I considered of most importance, although I know I did not specify it. I have the impression that the sale is prohibited to children, whilst in the case alluded to it was sold to a lad who received a halfpenny for his trouble, and therefore a mere child or little more.—Yours, etc.,

JUSTICE.

May 2*nd*, 1872.

Sir,—It did not occur to me that the question of your correspondent "Justice" had special reference to the age of the person to whom the poison was sold, or I would have replied to it in my letter yesterday. The Sale of Poisons Act does not contain any restrictions as to the age of the persons to whom the article is sold. An Act relating to the sale of arsenic, passed some years ago, does prohibit the sale of that article to persons not of full age; but in the recent Act to regulate the sale of poisons age is not mentioned; the prohibition in the use of arsenic, however, still continues in force. If your correspondent will favour me with a call, I shall be glad to show him copies of both Acts. I may add that I have learned that the packets of vermin killer in question were properly labelled with the name and address of the druggist, and the word "Poison" in prominent letters.—Yours, etc.,

W. WILKINSON.

263, *Cheetham Hill, Manchester, May* 3*rd*, 1872.

POISONING BY CARBOLIC ACID.

An inquest was held at Rotherham, on Friday, May 3rd, to inquire into the circumstances attending the death of Eliza Pye, a child five years of age.

Eliza Adams, who had adopted the child when its father died, said that the deceased child and another, whilst playing, had drunk some liquid from a bottle that she had obtained, as a disinfectant, from the Board of Health premises. She did not know until afterwards that the disinfectant was carbolic acid, and was not told that it was poison at the time it was given to her. She fetched it in an ordinary ginger-beer bottle.

The coroner expressed an opinion that a label should be placed on vessels containing these disinfectants, showing that they were poison, or that the persons to whom it was given should be cautioned as to its dangerous nature. He did not see why any distinction should be made between druggists and those who dispensed poisons as disinfectants at the Board of Health. The former were compelled to place a label upon the vessel or packet denoting that what they sold was poisonous, and they were obliged to give a caution to the persons receiving it as to their dangerous nature, and he thought the same should apply to the local authorities.

A verdict was returned by the jury that the deceased died from the effects of drinking carbolic acid, and appended to the verdict an opinion that the delivering out to persons of carbolic acid without a label, caution, or information of its character is dangerous, and should be discontinued.

The deputy-coroner said he would forward this expression of opinion by the jury to the proper local authorities.

American Diplomas.

On Tuesday, May 7th, an appeal was argued in the Court of Exchequer on behalf of Thomas Andrews, of Shrewsbury, against a conviction by the magistrates of that town for improperly using the letters M.D. after his name in accounts rendered. The appellant produced a diploma of the University of Philadelphia, United States, of the year 1870, but did not appear even to have visited the place or been examined before a qualified tribunal.

Their Lordships were all of opinion that the conviction should be affirmed, and dismissed the appeal with costs.

Baron Martin expressed his satisfaction that measures were being taken by the Legislature in America to suppress this issue of spurious degrees by the University of Philadelphia.

Obituary.

GEORGE ROBERT GRAY, F.R.S.

We regret to have to record the death, on Monday, May 6th, of George Robert Gray, F.R.S., Assistant Keeper of the Department of Natural History at the British Museum. Mr. Gray was the youngest son of Samuel Frederick Gray, author of the well-known 'Supplement to the Pharmacopœia.' The deceased gentleman was himself the author of some highly esteemed works on various branches of natural history.

GEORGE JOHN GILES.

George John Giles, late of the Seven Sisters Road, Holloway, died at Whiteparish, Wilts, on the 25th day of April, from pulmonary consumption, in the 25th year of his age.

MEETINGS FOR THE ENSUING WEEK.

Monday.........*Society of Arts*, at 8 p.m. — "Silicates,
May 13. Silicides, Glass and Glass Painting." By Professor Barff (Cantor Lecture).
Royal Medical and Chirurgical Society, at 8.30 p.m.
London Institution, at 4 p.m.—"Elementary Botany." By Professor Bentley.

Tuesday ......*Royal Institution*, at 3 p.m.—"Develop-
May 14. ment of Belief and Custom." By Mr. E. B. Tylor.

Wednesday ...*Pharmaceutical Society of Great Britain*,
May 15. at 12.—Annual Meeting. Evening, at 8.—Conversazione.
Society of Arts, at 8 p.m.

Thursday......*Royal Society*, at 9 p.m.
May 16. *Royal Institution*, at 3 p.m.—"Heat and Light." By Dr. Tyndall.
Chemical Society, at 8 p.m.

Friday ....*Royal Institution*, at 9 p.m.

Saturday......*Royal Institution*, at 3 p.m. — "Chemical
May 18. Action of Light." By Professor Roscoe.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Election of Council.

Sir,—The letter of 'Fair Play' alludes to the omission of the names of some of the candidates, mine amongst others, in the list which has been circulated by the Defence Association. Apart from its unfairness, I think it bad taste to send such circulars to those also who are thus blackballed by anticipation, soliciting them to vote against themselves.

I have been invited for several years to allow my name to be placed on the list, and have acceded on the present occasion, feeling that when new names are required, it is but reasonable to expect that those who have for years been connected with the Society, and shared whatever benefits have arisen therefrom, should be ready, if requested, to take their turn in carrying on its business and promoting its general welfare. I really know nothing of the Defence Association or its officers, and greatly doubt if they know much of me or my views. It would be therefore obviously unfair for either to denounce the other. There must be great and important interests to serve; and were I on the Council I could only give any question my best consideration and judgment, free from influence outside or in. Beyond that I can promise nothing, except that I shall not feel disappointed at a non-election, seeing there are so many excellent men ready to fill the vacancies that now occur.

It is to be regretted the Association should have issued the circular as emanating from the Pharmaceutical Society itself. The discovery of the misrepresentation would lead respectable readers to disregard the contents. "Qui mendax in uno, qui mendax in omnibus." Edward M. Burden.

Sir,—What a fuss Messrs. Smith and Co. are making about the Defence Association's circular! Mr. Smith surely forgets that his name was not only on a similar list last year, but that it was put there at the particular request of his friend Mr. Carr, and that his election was secured thereby; and further, that no protest or threat of legal proceedings was made by him at that time. Verily, the inconsistency of some people is passing strange. But the whole matter seems to lie in a nutshell; had the promoters of the circular placed Mr. Smith's name on the list, there would certainly have been nothing said about the circular "purporting to emanate from the Society," or of its "having a tendency to vitiate the whole election," from the Torquay quarter at least. As it is, however, I think he has, with the assistance of the Council, helped on the object of the Defence Associations very considerably; and had they known their circular was to be brought so prominently before the members through the Journal and otherwise, they might have saved themselves the expense of advertising.

I have not the least doubt but what the members will ratify the selection made by the Defence Committees, and show by their decision that they were right, at least, in excluding the names of Messrs. Smith and Carr from the list of gentlemen who have yet to make a public apology to their constituents for their actions in regard to the poison question last year.

As regards your editorial note, Mr. Editor, I cannot see how it could be possible for any man with a grain of common sense to mistake the Defence circular for the Society's official voting-paper. The parties who sent them in return to the Secretary as such, must have been opponents,* who did so for a purpose best known to themselves.

A word to your correspondent 'Fair Play.' Did it not occur to him, when he wrote his communication, that anonymous writing is anything but fair play? When he was so extremely anxious for the independence of individual members, he might have shown his own independence by giving his name. But I deny that there is anything in the circular that need be protested against. The heading might certainly have been worded differently, or some of the wording might have been transposed, which would have suited the requirements of the Defence Committee and left them free from the accusation that has been made against them of usurping the name of the Pharmaceutical Society; but as it is, it shows no indications of such, and I can confidently assert that such

* We are informed that Mr. Fairlie's assumption is incorrect.—Ed. Ph. J.

an idea was far from the thoughts of the composer at the time it was written; and further, I do not believe that any member of the Society could take any such meaning from it. This cry, got up by Messrs. Smith and Company, resembles very much drowning men catching at straws. 'Fair Play' complains that there are not sufficient London men on the Council. But whose fault is it? Certainly London chemists themselves: they have nominated the half of the candidates standing, whereas if they had united upon the half of that number they might easily return them all, and I am certain the provinces would not object. He also puts forth the claims of several gentlemen, while condemning the action of the Defence Committees. Mr. Savory we know by name, and Mr. Carr we know to our cost; but, as a provincial member, I have to ask who are Burden, Malden, Stacey, and Starkie? If would-be candidates do not think it their duty to let their opinions be known, they do not deserve the support of the members.

J. M. Fairlie.

Sir,—I have read with much interest Mr. Urwick's letter in yours of the 20th inst., and think that it would be wise if all the gentlemen nominated would express their opinions in the straightforward manner he has done.

With regard to the compulsory regulations, I fancy there is a very great chance that this question will eventually die out, and that there will be no need for the Government to make compulsory regulations which to the majority of the profession will be always looked on as obnoxious.

The returns of the Examining Board show that only men properly qualified are now admitted into our ranks, and all danger of negligence is to a certain extent avoided.

But it is not so much to this point I wish to draw the attention of your readers, as to the latter portion of Mr. Urwick's letter, and I hope the Council may be prevailed on to place all on an equal footing, for as he remarks, the difference in the public mind is very slight, and it is comparatively few who know the distinction between member of the the Pharmaceutical Society, pharmaceutical chemist, and chemist and druggist, by examination.

It is to my way of thinking only right that the men who have passed the Board of Examiners should have a different title to those who only acquired it by having been in business before a certain date.

I trust should Mr. Urwick be successful in obtaining a seat at the Council Board, he will bring forward this important question.

April 29th, 1872. Chemist and Druggist.

Provincial Education.

Sir,—I do not hold the narrow views imputed to me in your leader of May 4th, nor will anything I have written fairly warrant such a conclusion. The recent action of the Council has strongly justified the opinions expressed in my short letter on Provincial Education, page 338, Pharmaceutical Journal.

In claiming grants for provincial education, we believe we are in strict accord with the original intentions of the founders of the Society; men whose aim and object was to elevate and benefit the whole body of chemists and druggists.

Thirty years ago, 1843, the Council in their annual report, "assured the country members that the establishment of provincial schools, and the extension of means for facilitating education throughout the country, locally, has by no means been lost sight of," and the same report further says, "It is evident that the provincial schools of pharmacy must be assisted, in the first instance at all events, with grants of money." In 1843 advances were made to branch schools to the amount of £221, and in the following year £90; unfortunately just at that time a change took place which resulted in a loss of income to the Society of about £3000 a year, and of course no more grants could be made. From this it will be seen we are simply going back to first principles. We ask no eleemosynary aid, nor have we any nefarious designs on the funds of the Society.

Referring to the report in the Journal, it is evident the Council are now alive to the importance of this question. Some of the speeches were not only just, but generous. I do hope, however, there will be no undue haste in this matter; what is needed is not merely money, but a well-digested and comprehensive scheme likely to secure the best results, and to give stability to local efforts by affiliating the associations as branch schools with the Parent Society.

We have not asked for a grant in Hull, although we have established lectures, classes, etc., at considerable cost, to which all assistants and apprentices in the trade have access on equal terms. Our botanical lectures opened last week at the Botanic Gardens, with a class of 24 present, of whom 18 were assistants and apprentices.

I regret that Hull, like all other towns, has so small a proportion of members of the Society, viz.: 19 out of 90 in business; we do not, however, forget the benevolent fund, to which we have 37 subscribers.

It is gratifying in one respect to know that the school of pharmacy in Bloomsbury Square derives its chief support from country students.

Hull, May 7th, 1872. James Baynes.

[*** Mr. Baynes is mistaken in supposing that we regard the view put forward in the letter he refers to as being a narrow one. On the contrary, our objection to the argument he and others have based on the fact that country members have contributed largely to the educational establishment in Bloomsbury Square, is that it is illogical, inasmuch as it is not country members who now require the aid of the Society, but for the most part others who have never contributed to its funds. We fully concur with Mr. Baynes in his estimate of the original intentions of the founders of the Society; but we must also remind him that they distinctly pointed out that it was only by the joint assistance of the whole body that the foundation could be laid for systematic education. However, we cordially agree with him in hoping for the speedy organization of some comprehensive educational scheme, that will be for the *general* good of the trade, in accordance with the Society's original aim and intention.—Ed. Ph. J.]

Benevolent Fund.

Sir,—The Pharmaceutical Society, and more especially its unfortunate members, are much indebted to the late Mr. Orridge for the vitality now manifested in the working of the Benevolent Fund, which, for many years from its commencement, was little better than an abortion; but, however much the present is an improvement upon the past, Mr. Scholefield has shown in your issue of a fortnight ago, that there is yet great room for improvement. As local secretary, I have made many applications on behalf of the fund, and have frequently met with refusals on the ground that misfortunes near at hand, and calling for immediate relief, had much stronger claims than a fund from which the unfortunate of the present generation could derive so little benefit, compared to the sacrifices made by the subscribers, who are in many cases at least, as far removed from affluence as they are from indigence. I have constantly felt that such objections were both natural and forcible, and that I could not reasonably urge a donation. I cannot see any grounds upon which pharmacists of the present day should be expected to tax themselves for the relief of necessitous members of their calling in future generations. The present race have had to struggle against inordinate competition and other difficulties, from which the coming generation will be saved by the operation of recent legislation. I see no reason to doubt that the pharmacists of twenty years hence will be a better remunerated class; they will include fewer poor, and a greater number of well-to-do members. There will be fewer demands upon their charity, and greater ability to meet those demands. Why then should we be taxed to relieve them of the responsibility, or, perhaps I should say, to deprive them of the pleasure which the prosperous tradesmen must always feel in mitigating the suffering caused by such misfortunes as were not provided against, because they could not be foreseen? Our present bye-laws require that all donations shall be invested, and not applied to current requirements, but I see no reason why the whole of the annual subscriptions, as well as the interest upon funded capital, should not be applied to the alleviation of present necessities.

"Sufficient for the day is the evil thereof."

I trust that some member of the incoming Council will make this subject his hobby, and ride it home, and that in the meantime some other local secretaries will give us the benefit of their experience, and account for the small number of subscribers to be found in many a flourishing town.

Barnard S. Proctor.

11, *Grey Street, Newcastle*,
April 30th, 1872.

Early Closing.

Sir,—It may assist the early closing movement, when I mention that for years I have had the window and door shutters put up at 8 P.M., and I hope others will now follow my example, and that we shall soon see the absurd plan of keeping up one shutter and keeping another shutter down, like coloured bottles, "things of the past."

William T. Cooper.

26, *Oxford Street, London.*

The Profession of Pharmacy.

Sir,—In a recent letter appearing in your pages from the pen of Mr. Rimmington, the term "Profession" with a note of interrogation after it occurs, implying, I presume, the writer's doubt as to the correctness of the term. As several of your correspondents have latterly made considerable use of the word when writing of our calling, it may not perhaps be considered out of place to inquire how far we are warranted in the use of the word. My own impression is that in writing or speaking of our business as the "profession of pharmacy," we allow zeal to outrun discretion. Strictly speaking, and according to general usage, "profession" means a calling or vocation by which a livelihood is obtained through the medium of a special branch of science, law, or literature, in contradistinction to "trade," which implies a trafficking in goods for the sake of profit. Now without doubt our daily occupation must be classed under the latter term; we are mere dealers or traffickers in goods. We may possess a well-fitted laboratory for the preparation of pharmacopœia compounds, or for scientific investigation, and our shelves may be well-filled with pharmaceutical preparations; but our counters and cases are stocked with perfumery, soaps, toilet requisites of every conceivable description, pickles and sauces, grocers' sundries, tobacco and cigars, seeds, etc.; our cellars with oils and colours, and odds and ends of nearly every trade under the sun. Does the sale of these accessories with drugs suffice to rank us with professional men?

That there exist pharmacies where the drug trade almost pure and simple is carried on I know, and I admit that the proprietors of such, and even of others, by reason of superior scientific attainments, may almost lay claim to professional rank; but in the majority of establishments, the sale of pharmaceutical preparations forms only a small portion of the returns, and so trading has to be tacked on to what might otherwise constitute the elements of a profession.

We all look forward to the time when the interests of pharmacy will be confided to the care of a more highly educated class of men; when medical men will confine themselves strictly to their own special branches of science, leaving dispensing to those who devote their time and money to its study and work; and when even stricter examinations will tend to reduce the number of aspirants to its ranks. Then, and not till then, will the dispensing and preparation of drugs alone be sufficiently lucrative to induce the followers of pharmacy to tear from its stem the parasitic growths which at present encumber it, and so render it worthy of the appellation "Profession of pharmacy."

M. J. Ellwood.

Leominster, April 30th, 1872.

Who Shall Dispense?

Sir,—I am obliged to you for inserting my letter in last week's Journal, but in common with many other would-be writers, I find that the letter does not express so explicitly as I would wish the idea I desire to impress on the members of the trade.

With your permission I will submit the following propositions:—

Thanks to the efforts of the late Jacob Bell and others, chemists, as a body, hold a far better position than formerly For the future a severe educational test will be applied to all entering the trade. This education must involve a great outlay both of time and money. The present state of things leaves so small a proportion of dispensing in the hands of chemists, that few persons of good position will care to bring up their sons to the calling, and the evident tendency of the trade is to restrict the chemists' business to dispensing.

Being now by law recognized as an educated body—being by law compelled to assume great responsibilities, I contend that it is a duty to ourselves and to those who may come after us, to make the calling worthy of the education and responsibility. This can only be done by making the chemist (call him pharmacist if you like) the only recognized dispenser of medicine.

I know that this proposition involves a great deal, that it will take time and occupy far abler heads than mine to work out the problem, but I want to set the idea before the members of the trade (I would avoid the term profession yet awhile). From conversations I have had with different members of the medical profession, I feel confident they will willingly assist us; but we must bear in mind that when they cease to be dispensers, we must cease to be prescribers.

Henry Lawrence.

Kensington, W.

Preliminary Examination.

Sir,—I think you would have a decided improvement in the answers of candidates sitting for the above examination, if a little more time was allowed, say an hour and a half to each subject, making a total of four and a half hours for the whole. If the twenty questions given by the Board of Examiners be answered in three hours, it is only an average of nine minutes to each, and allowing twenty minutes for the composition question, it makes even that average considerably less.

Then again, I think that some little consideration ought to be made in the case of candidates who were apprentices previous to July, 1867, or many youths must forfeit that which would have been the result of a large premium, or in other words, have their prospects blighted for life. It is almost impossible for a youth to so ground himself in English grammar (after having left school for several years) as to answer such questions as the following:—"Into how many classes are adverbs of time divided? Give several examples of each." Will it not be well for preliminary candidates to state on the form of application, if they were in the profession before the passing of the Act or not?

One who Failed on April 8th.

A. Strachan.—Your letter has been handed to the Secretary.

M. J. Ellwood.—'How Crops Grow,' published by Macmillan.

C. Andrews.—A retailer of beer, spirits and wine can sell under his licence rectified spirits of wine, but he cannot, under any circumstances, sell methylated spirit on the same premises; nor would the revenue authorities grant a licence to sell methylated spirit to a retailer of beer, spirits and wine on the premises on which these goods are sold.

G. C.—(1) Phosphate of lime with colouring matter. (2) Yes. (3) The deposit cannot be utilized, as it is less soluble in the acid than when first made.

O. J. Rivett.—Chloride of sodium does not burn. The colour of the flame is due to the vaporization of a small portion of the chloride.

The following journals have been received:—The 'British Medical Journal,' May 4; the 'Medical Times and Gazette,' May 4; the 'Lancet,' May 4; the 'Medical Press and Circular, May 7; 'Nature,' May 4; the 'Chemical News,' May 4; 'English Mechanic,' May 3; 'Gardeners' Chronicle,' May 4; the 'Grocer,' May 4; the 'Journal of the Society of Arts,' May 4; 'Grocery News,' May 4; 'Transactions of the Odontological Society,' for April; 'The Chemists' and Druggists' Advocate,' for April 20; 'Le Moniteur Scientifique-Quesneville' for April; 'Vierteljahresschrift für praktische Pharmacie' for April; 'British Journal of Dental Science' for May; 'Florist and Pomologist' for May; 'Neues Jahrbuch für Pharmacie,' Sept., 1871, to Feb., 1872; 'Zeitschrift des allgemeinen österreichischen Apotheker-Vereines' for May 1; the 'Practitioner' for May; 'Michigan University Journal' for April; 'Journal of Materia Medica' for April; 'Food, Water, and Air' for May.

Communications, Letters, etc., have been received from Mr. H. Pocklington, Mr. A. Jones, Dr. Archbold, F. J. Furnivall, G. T., "Student," "Country Major Associate," "One who has known the Drug Trade," etc.

THE MICROSCOPE IN PHARMACY.

BY HENRY POCKLINGTON.

PSYCHOTRIA EMETICA—Striated Ipecacuanha.—This is little known to British commerce,* and not obtainable through the ordinary channels of trade, except perhaps at rare intervals. Hence, I suspect it is not so commonly used as an adulterant as is generally supposed. Its structure is so like that of *Caphaelis* that a very brief notice of it will suffice. Careful observation alone could enable the analyst to suspect its presence as an adulterant; and he would hardly be justified in pronouncing positively about it without the corroborative evidence of chemical analysis. The difference between these two Ipecacuanhas are in degree rather than in kind, so far as relate to their microscopic anatomy. The cells of the medulla in *Psychotria* are larger, more pitted, and more disposed towards secondary deposits. Their contents, starch granules, vary too much in size and shape to afford the basis of correct diagnosis; but the granules are less aggregated than in *Cephaelis*. The cells of the wood zone are larger in *Psychotria* and are much more thickened with sclerogen deposits. If a transverse section be treated with acidum nitricum (B. P. strength) for five minutes, and removed to a drop of pure glycerine, in which it is allowed to macerate for about ten minutes before being transferred to fresh glycerine for observation, the successive layers of the sclerogenous deposit will be beautifully demonstrated. The outline of these wood cells, as seen in transverse section, is less decidedly angular than in *Cephaelis*, but is less oval than in *Richardsonia*. As in *Cephaelis*, they contain starch granules, but their pitting is more pronounced than in the true Ipecacuanha, but the cells appear more independent of each other and more easily isolated. The cells of the cortical zone are very irregularly shaped, have exceedingly thin walls, and vary much in size near the woody zone, at the circumference of which they approximate to the pleurenchyma cells of the ordinary vascular sheath, spiral vessels being absent. A few raphide receptacula are present, the raphides being acicular. The botanical characteristics of the two Ipecacuanhas are too well known to require comment, and are much more striking than the microscopic ones.

RICHARDSONIA SCABRA.†—This I suspect is much more commonly present in pulv. ipecacuanha than the foregoing, and is fortunately much more easily recognizable, though its general structure accords with that of *Cephaelis*. It is much more easily distinguished from either of the others by its ordinary botanical characters than by its microscopical, through the absence of medulla, and the great proportion of starch can leave but little doubt as to its presence or not in any given powder.

The diameter of the wood zone is exceedingly small in proportion to that of the cortical zone. The woody fibres resemble those of *Cephaelis* more than the fibres of *Psychotria*, but in some of them a spiral deposit may be made out with the aid of nitric acid, a high power and careful illumination. They are much more regular in outline, as seen in transverse section, and are somewhat oval, sometimes nearly circular. The cells of the cortical zone are more regular than in either of the others, and in horizontal section are often hexagonal in shape; are full of starch, which lies somewhat loosely within the cells. The starch granules differ in shape from those of *Cephaelis*, being more angular, and less disposed to form aggregate granules. Their polariscope reaction appears to be identical. In addition to the adulterants named in my notes on *Cephaelis*, I will now mention the starch of *Arachis hypogea* the origin of which troubled me for a long time until a friend kindly gave me a piece of oilcake, which he said was adulterated with "ground-nut buffum," and I recognized therein an old but nameless friend I have repeatedly met with in cocoa and chocolate, and but yesterday in *fresh butter*.*

(*To be continued.*)

* Mr. Jas. Collins, in kindly replying to some queries about it, informs me he has seen but one parcel in the market.

† The specimens from which my description is taken were procured through commercial channels by the kindness of my friend Mr. R. Bellamy, of Hull. I am in consequence not confident as to the correctness of the specific name. They reached us unnamed.

Since the foregoing description of *Richardsonia* was sent to press, Mr. James Collins has kindly sent me a specimen of genuine *R. Scabra*, which presents many structural differences from that previously described. In the specimen now referred to, the wood zone contains numerous pitted vascular ducts of considerable size. The wood cells are somewhat irregularly distributed, but are in other respects similar to those already described. The cells of the cortical zone of the true *R. Scabra* are less decidedly hexagonal, their walls are thinner and somewhat sinuous. Their contents are starch granules, which are less angular in form, the separate granules being often round, with a distinct but variable hilum. There are fewer raphides present. The doubt expressed in my footnote is thus confirmed so far as regards the specific name of the specimen described.

* In company with salt, sugar, stearine, water, brains, etc., and sold at dairy butter price in a respectable shop, whence it wound its way to my tea-table.

SUBSTITUTION OF CARBOLIC OR PHENIC ACID FOR CREASOTE.

COMMUNICATED BY MR. T. N. R. MORSON.

The value of the wood creasote of Reichenbach as a remedial agent, and its employment in the preservation of articles used as food, has been fully proved during the forty years we have been manufacturers of this article.

Of late years its reputation has suffered from the substitution of carbolic or phenic acid for true creasote; and as no good test to distinguish these bodies has been published (and those of our Pharmacopœia are for this purpose useless), we shall feel obliged by your publishing a very simple means for distinguishing these two bodies, which my son, Mr. Thos. Morson, has discovered in making some experiments on adulterated samples submitted to us. This test is glycerine, in which true creasote is *insoluble, or nearly so*. Carbolic or phenic acid, on the contrary, *dissolves in all proportions*, and any large amount of this latter substance, if mixed with true creasote, will render the creasote soluble.

The danger of substituting carbolic or phenic acid for creasote to be used internally or for food is well known.

To test a suspected sample, mix it with an equal quantity of pure glycerine. If they unite and make a clear solution, the substance is carbolic acid, or in greater part consists of it.

CONTRIBUTIONS TO THE HISTORY OF THE OPIUM ALKALOIDS.

BY C. R. A. WRIGHT, D.SC.

(*Continued from page* 885.)

The portion of the first Na_2CO_3 precipitate insoluble in ether is dissolved in HCl, and fractionally precipitated by Na_2CO_3, to remove colouring-matters as much as possible; the last precipitate, after thorough washing and drying, forms a light buff-coloured amorphous powder that does not soften at 100° when perfectly dry, but clots to a resinous mass if heated in the water-bath while still moist; it is soluble in alcohol, is precipitated from this solution on addition of ether, and yields salts that have no vestige of crystalline characters.

Both the crystalline and the non-crystalline hydrochlorates yield on analysis numbers identical with those required for codeia hydrochlorate; for the reasons developed in the subsequent sections, they are regarded as respectively di- and tetra-codeia.

The filtrate from the original Na_2CO_3 precipitate contains much unaltered codeia; by extracting with ether and agitation of the extract with excess of phosphoric acid solution, a mixture of phosphates is obtained, from which a further quantity of each polymeride is obtainable by simply boiling down the liquid till the boiling-point reaches 200°

The hydrochlorate of tetracodeia obtained as above described forms a brownish brittle tar not fusible at 100° when dry; dried at 100° it yields the following numbers:—

Specimen A. 0·325 grm. gave 0·773 CO_2 and 0·186 H_2O.
„ B. 0·3145 „ 0·732 „ 0·185 „
0·1215 „ 0·0495 AgCl.

	Calculated.		Found.	
C_{144}	1728	64·38	64·87	63·48
H_{176}	176	6·56	6·36	6·54
N_8	112	4·17		—
O_{24}	384	14·30		—
Cl_{28}	284	10·59		10·08
$C_{144}H_{168}N_8O_{24},8HCl$	2684	100·00		

The free base gave the following numbers:—
0·8095 grm. gave 0·818 CO_2 and 0·190 H_2O.

	Calculated.		Found.
C_{144}	1728	72·24	72·08
H_{168}	168	7·02	6·82
N_8	112	4·68	
O_{24}	384	16·06	
$C_{144}H_{168}N_8O_{24}$	2392	100·00	

In appearance and most physical properties tetracodeia and its salts bear a great resemblance to chloro- and bromo-tetracodeia; and they further agree in that all yield a blood-red colour on warming with silver nitrate and nitric acid, or with nitric acid alone; it differs from chloro-tetracodeia in that the aqueous solution of the hydro-chlorate does not precipitate on the addition of strong HCl, the salt being apparently as soluble in diluted HCl as in water; also the free base does not oxidize so readily. In all respects tetracodeia agrees with the description given by Anderson of his "Amorphous Codeia"* obtained by the action of sulphuric acid on codeia; on comparison with the product obtained by Anderson's process, no essential differences could be detected between the two substances, except that the phosphoric acid product was somewhat darker in tint, owing no doubt to the presence of colouring-matters from the higher temperature employed in its production.

The hydrochlorate of dicodeia obtained as above described crystallizes with $3H_2O$ for every C_{18} contained, this water of crystallization being wholly lost at 100° and partially by standing over sulphuric acid.

* Anderson, Ed. Phil. Trans., vol. xx. (I), p. 57.

Dried at 100°, these crystals gave the numbers:—
0·306 grm. gave 0·719 CO_2 and 0·182 H_2O.
0·3135 „ 0·742 „ 0·194 „
0·229 „ 0·098 AgCl.

	Calculated.		Found.	
C_{72}	864	64·38	64·08	64·54
H_{88}	88	6·56	6·61	6·88
N_4	56	4·17		—
O_{12}	192	14·30		—
Cl_4	142	10·59		10·60
$C_{72}H_{84}N_4O_{12},4HCl$	1342			

Na_2CO_3 throws down from the solution of the hydrochlorate white amorphous flakes that do not oxidize spontaneously in the air. Dried at 100°, 0·2965 grm. gave 0·7765 CO_2 and 0·189 H_2O.

	Calculated.		Found.
C_{72}	864	72·24	71·43
H_{84}	88	7·02	7·08
N_4	56	4·68	
O_{12}	192	16·06	
$C_{72}H_{84}N_4O_{12}$	1196	100·00	

If the solution of the hydrochlorate be concentrated the addition of Na_2CO_3 solution throws down tarry globules consisting of a mixture of the base and its hydrochlorate, the salt being sparingly soluble in the NaCl solution formed by the decomposition.

Dicodeia and its salts do not yield a blood-red colour with NO_3H, only a slight orange tint; $FeCl_6$, also SO_4H_2 $+K_2Cr_2O_7$, give no colour reactions.

In general properties, and in the fact that water of crystallization possessed by the hydrochlorate is lost at 100°, dicodeia bears a great resemblance to the "isomer of codeia" oqtained by Drs. Matthiessen and Armstrong by the action of diluted sulphuric acid on codeia. On comparison with the product obtained by Armstrong's process, no difference whatever was discernible provided the hydrochlorate obtained by the action of sulphuric acid, etc., were several times re-crystallised; the crude hydrochlorate contains, besides the dicodeia salt, the hydrochlorate of another polymeride, which differs from dicodeia hydrochlorate in that it is non-crystalline, drying up to a gummy, extremely hygroscopic and deliquescent substance; it yields a blood-red colour with NO_3H, and with $SO_4H_2+K_2Cr_2O_7$ a very evanescent purplish-red; Fe_2Cl_6 gives no colouration at first, but on standing a reddish-purple tinge appears, gradually becoming more intense. Na_2CO_3 throws down an amorphous white precipitate, which is soluble in ether, and but little changed by exposure to air. From these properties, which seem to be analogous in some respects to dicodeia, in others to tetracodeia, the base is considered to be intermediate between these two polymerides, *i.e.*, to be *tricodeia*. The crude hydrochlorate of dicodeia obtained by Armstrong's process on re-crystallization furnished mother-liquors which, on standing over SO_4H_2 for several weeks, gradually deposited crystals, and finally became a crystalline mass wetted with a viscid non-crystalline liquid; by gentle pressure in filter-paper the liquid portion was separated from the crystals, which were found to be only dicodeia hydrochlorate; and finally, the treacly hydrochlorate of tricodeia was extracted from the papers by water. On repetition of the treatment over SO_4H_2, no crystals were obtained; at 100° a brittle, gummy, hygroscopic substance was obtained, of which.

0.309 grm. gave 0.730 CO_2 and 0·191 H_2O.
0·208 „ 0·0895 AgI.

	Calculated.		Found.
C_{108}	1296	64·38	64·43
H_{132}	132	6·56	6·87
N_6	84	4·17	—
O_{18}	288	14·30	—
Cl_6	213	10·59	10·64
$C_{108}H_{126}N_6O_{18},6HCl$	2013	100·00	

THE FIRST ANNIVERSARY DINNER OF THE PHARMACEUTICAL SOCIETY.

On Tuesday, what will probably prove to be but the first of a long series of similar gatherings, took place at the Crystal Palace, when a company of over two hundred gentlemen connected with the Pharmaceutical Society, with their friends, dined together, under the presidency of Mr. A. F. Haselden, F.L.S., the President of that Society.

The Chairman, in proposing the first toast, said: Gentlemen,—Mine is the privilege, and I may add the honour, of proposing the first toast of the evening, a toast which always finds a ready response amongst Englishmen, viz., "The health of Her Most Gracious Majesty the Queen, their Royal Highnesses the Prince and Princess of Wales, and the other members of the Royal Family." No words of mine can add to the virtues, the many virtues which adorn our Sovereign Lady the Queen. As a lady, a parent, and a monarch, I know not where I could look for her equal. She reigns in the hearts of her subjects; her sympathies are truly with them; when they sorrow she sorrows, and when they rejoice she rejoices. The loyalty of the people of this country towards Her Majesty and the Royal Family of England is unequalled. Were it possible that any could doubt this feeling, I would simply call to their remembrance the dark and dreary days of last December, and the bright and joyous day of Thanksgiving in February. His Royal Highness the Prince of Wales enjoys the esteem and affection of the people, but, indeed, it was only when we feared we might lose him that we discovered how much we loved him. For that good, kind, amiable, loving and beloved lady, the Princess of Wales, I have only to whisper her name to make all faces radiant with smiles of approbation; and all the junior members of the Royal Family are winning the hearts and loyalty of the people. I need say no more but repeat the words of the toast, "The Health of Her Most Gracious Majesty the Queen, coupled therewith their Royal Highnesses the Prince and Princess of Wales and all the members of the Royal Family of England." These few words produced frequent applause, which was continued for some minutes at the end, and was followed by the band playing "God Save the Queen."

Mr. T. Hyde Hills proposed "The Army, Navy, and Reserve Forces," which was appropriately responded to by Captain Starkie.

Mr. Brown, of Manchester, was called upon to propose the health of the "Medical Profession." He said it augured well both for the past and future, to see so large a gathering at the first of what he hoped was destined to prove a long series of annual festivals. He was glad to think that the day had passed for any absurd jealousies between the medical profession and that of pharmacy. It must be to the interest of the medical profession that they should have as their colleagues an educated body of men, capable of carrying out their instructions, and assisting them to the fullest extent in their philanthropic labours; and the cordial understanding which now existed, had, he believed, been greatly promoted by the founders and conductors of the Pharmaceutical Society. And day by day this good understanding was increasing, especially in London, but he hoped that even in the country the happy consummation was rapidly approaching when the general practitioner who dispensed his own medicines would disappear, and his place be taken by the educated physician of the future, who would find abundant employment for the educated pharmacist. There ought not to be any antagonism between such a noble profession and those who were so closely allied to it. It had been well said—

> "A wise physician skilled our wounds to heal
> Is more than armies to the public weal;"

but an army was of no use without a general, nor a general unless his orders were intelligently and promptly carried out. The physicians of the present day were able—thanks in great measure to the efforts of the Pharmaceutical Society—to rely on their prescriptions being faithfully and properly dispensed; and he hoped, therefore, they would give pharmacists plenty to do. It was true that prevention was said to be better than cure, and, therefore, sanitary questions now occupied a prominent position, but even in that work chemists were always ready to give their aid. In conclusion he alluded to the recent illness of the Prince of Wales, and to the unremitting care and attention of his medical advisers, which, he said, was equally bestowed daily and hourly by thousands of men who looked for no honour or reward for their labours beyond that of a good conscience and the gratitude of those who entrusted their lives to their care. He begged to couple with the toast the name of Dr. Leared.

Dr. Leared, in responding, said the profession for which he had the honour to speak, was a great and glorious one, notwithstanding everything that could be said against it. Alluding to a recent article in a weekly journal, which put the question whether the world would not have been as well or better if there had never been either physicians or physic in existence, he remarked that a similar question had been put with reference to the members of a cognate profession—the Church; and there was not the least doubt that if the cynical scrawler who wrote that article were taken ill himself, he would soon enough run to a physician, get a prescription, no doubt with the cabalistic marks upon it to which he alluded, have it dispensed, and take the medicine with the full expectation of getting better. He believed an age of therapeutic science and discovery was at hand, and that in the future, more than ever, the hearty co-operation of zealous, educated pharmacists would be required.

Dr. Greenhow proposed "The Pharmaceutical Society of Great Britain," not simply as a matter of form, or because he had been requested to do so, but with all his heart, and from a thorough knowledge and appreciation of what it had done. The Society was originally a voluntary association, but upon it had now devolved by Act of Parliament a very onerous duty, in which every member of the public was interested, viz. of preparing such regulations as should ensure the proper education of all future chemists and druggists, and of testing the fitness of candidates for the duties they were to undertake. And he would venture to say, with a full knowledge of the facts, that no society could have carried out these duties with better judgment or more prudence and skill; in fact, the system of examination was as near perfection as it was possible for anything human to be. He believed the Society had a great future before it, for division of labour was the order of the day. There was a day, not so far distant, when the apothecary and the grocer were one and the same, and a little further back, surgery and shaving were practised conjointly. These incongruous callings had now been separated, and he foresaw the time when the public would learn that a chemist and druggist with the qualification of the Pharmaceutical Society was thoroughly competent to prepare their medicines, and would rather have them prepared by such men than in the surgery of a private practitioner,—a time when medical men would be only too glad to disembarrass themselves from the irksomeness of preparing medicines, and would seek not for the profits of trade, but for a proper remuneration for skill and service rendered. He begged to name Mr. Mackay in connection with the toast.

Mr. Mackay said the Society had now existed many years, but from its formation but one object had been kept in view, viz., the advancement of pharmacy, and he need not say how well it had fulfilled its mission. He had had put into his hand a curious piece of evidence as to the wonderful change which had taken place in the prices of drugs and pharmaceutical preparations. It was an invoice, dated Feb. 23rd, 1798, sent by the Apothecaries' Company to a surgeon on board a ship lying at Sheerness, and amongst the articles supplied were 2 oz. camphor at 1s.; 4 oz. powdered ipecacuanha, 9*s*. 6*d*.; 1 lb. sugar of lead, £1; 8 oz. magnesia, 3*s*.; 2 lb. olive oil 4*s*. 8*d*., etc. with a postscript to the effect that the Company did not take back empty bottles. He was, however, glad to say that there had been a reform in prices since then. He was proud to say the Society had done a little, though, perhaps, not so much as they would have liked. In regard to the Pharmacy Act of 1852, they all knew what a goodly proportioned Bill went into Parliament, and what a miserable skeleton came out. Still, small as it was, it turned out to be a step in the right direction. Then came what had been called by some, a piece of good luck, when, in 1862, pharmaceutical chemists were exempted from serving on juries, provided they lived in England or Wales; but it was a subject for regret that in Scotland there was no exemption, simply because the operation of the Bill did not extend so far north as to cross the Tweed. He might further state that in a Bill read a second time the previous evening, and issued under the patronage of the Attorney-General that day, there was a clause exempting all registered apothecaries, medical practitioners and registered chemists from jury service. Still, even here the old fault was not amended, for Scotland was left out. This was, no doubt, owing to the proverbial modesty of Scotchmen in not advancing their claims, but he hoped the defect would be remedied before the Bill passed. He then made an allusion to the memory of the founder of the Society, Jacob Bell, thanked Dr. Greenhow for the eloquent manner in which he had proposed the toast of the evening, and expressed a hope that in the future, even more than in the past, the working of this Society would serve as a bond of union between all members of the business. He concluded by saying that had the Society done no more than put forth the efforts it had on behalf of Pharmaceutical education, and been the means of bringing together on such an occasion as the present pharmacists from so many parts of the country, it would well deserve the application of the following lines:—

> "Behold how good a thing it is,
> And how becoming well,
> Together, such as brethren are,
> In unity to dwell."

Dr. De Vry was called upon to propose the next toast, "The British Pharmaceutical Conference." He said he had watched with great interest and satisfaction the growth of the British Pharmaceutical Society; and one of its children was the Annual Conference. True, it was still but a young one; but, judging of what it had done during the last few years, and comparing the result with that of similar societies in France and Germany, which he, as a foreigner could do quite impartially, it might be congratulated upon the position it had attained; and as they had done so much already, it was only natural to expect they would go on and do much more in the future. If so much good had been done, they must all acknowledge it was in a great measure owing to the efforts of the leaders of the Society; and, therefore, he must add to the toast the name of its most able President, Mr. Brady, and its Secretary, Dr. Attfield.

Mr. Brady, in acknowledging the toast, said since he had been elected President he had had the honour of attending the sittings of an analogous body on the opposite side of the Atlantic; and with a vivid recollection in his mind of the amount of scientific work performed by the American Pharmaceutical Association, he felt just the slightest misgivings about their ensuing meeting at Brighton. He did not doubt the Pharmaceutical Conference; he never had doubted it; nor did he say they would not come out of that meeting as they had out of every previous one, able to report a certain amount of advancement to pharmacy; but he had felt a little doubtful whether they were undertaking that amount of pharmaceutical research which, as a body, they ought to. It was true that within the last four or five years there had been questions of more immediate moment pressing upon them, and that might account for the advancement of the scientific part of the programme being somewhat neglected. But now this political excitement was passed, he hoped they would give themselves to that earnest research and careful investigation of pharmaceutical problems on which alone the Conference, as distinguished from the Society, must rest its dignity and position. They must not rest on their oars if they would hold, in the estimation of Dr. De Vry and those who worked with him, the same position which he was very happy to hear they now did.

Mr. Schacht (Clifton), next proposed "The School of Pharmacy," commencing his remarks with the phrase recently used on a somewhat similar occasion by Mr. Disraeli, "Forty years ago." He said that without in any way disparaging the last generation, it might fairly be claimed for the present that some progress had been made since that time; and though many things had concurred to produce that result, some of which had been already alluded to, there could be no doubt that the main difference between the chemists of 40 years ago and the pharmacist of to-day was the superior scientific education which the latter might lay some claim to possess. This, of course, had been primarily brought about through the agency of the School of Pharmacy in London; and though it might be possible that more might be done, and that other agencies of equal potentiality might be brought into action, no one could disparage the work which that school had done, and was doing. He was always proud to think that he had been one of the earliest students of that school, and it was very gratifying to find that so many whose names had been connected with it from the commencement were still working on its behalf. It was always a great pleasure to him to look back to the time when he was a pupil of Dr. Redwood's, and he would beg to couple his name with the toast.

Dr. Redwood, in responding, said the task of proposing the toast could not have fallen into more appropriate hands; for although a large number of those present had been students in the school of pharmacy established in Bloomsbury Square some thirty years ago, he believed Mr. Schacht was the only one who represented the first fruit of the school. Since the time when Mr. Schacht entered as one of the eight or ten students who formed the laboratory class with which they commenced, he and many others, emanating from the same source, had become in different parts of the country active promulgators of pharmaceutical knowledge. These might be looked upon as so many schools dotted over the country, in which students were so well instructed that a large proportion of them were enabled to pass the required examinations without any further assistance. There was this marked difference therefore between the state of things now and thirty years ago, that while there was then only one school, there were now some hundred or more. He concluded by expressing the hope that the school of pharmacy, to which the toast referred might long prosper under the guidance of the Council of the Pharmaceutical Society, stimulated from time to time by those who, like Mr. Schacht, devoted their special attention to the promotion of pharmaceutical education.

This concluded the list of toasts, but notwithstanding that the Committee had printed a request that no other toasts should be added, there was a general feeling that the health of the President should be drunk. Mr. Savory therefore proposed the toast in a short speech, and it was drunk with acclamation. Mr. Haselden then thanked the company for the compliment. The remainder of the evening was spent in conversation, and in listening to the capital music of the Grenadier Guards' band.

The Pharmaceutical Journal.

SATURDAY, MAY 18, 1872.

Communications for this Journal, and books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE WEEK.

THE ample report which the present number contains of the various meetings in connection with the Pharmaceutical Society during the week, will explain the delay of a day which has occurred in its issue, and preclude the necessity for any lengthened reference to them here. The gathering at the Crystal Palace was all that could be desired in the way of success. Upwards of two hundred gentlemen sat down to dinner, and it was evidently the general feeling that in future years the Annual Dinner should constitute a part of the programme of the anniversary week. The wise limitation of toasting observed at the dinner, prevented a direct acknowledgment of the enthusiastic exertions of the well-known gentleman who was mainly instrumental in realizing an idea that has been for some time floating in the minds of those who are anxious to promote the well-being of pharmacists, but his services in this respect were not the less esteemed, nor will they be readily forgotten.

The Conversazione at South Kensington was well attended by about three thousand ladies and gentlemen, and this ample response to the invitations of the President and Council, not only by members of the pharmaceutical body, but also by medical and scientific men generally, is satisfactory testimony to the estimation in which the Pharmaceutical Society is held.

At the Annual Meeting, as perhaps might have been expected, the discussion turned principally upon the subject of pharmaceutical education in the provinces. The question was ably opened by Mr. ATKINSON PICKERING, of Hull, who was supported by Mr. RADLEY, of Sheffield. There was great unanimity of opinion amongst gentlemen present that something more should be done; but there was equal agreement that the subject was one of great difficulty. On the one hand, Mr. PICKERING expressed a doubt whether it would be possible to support permanently country schools of pharmacy without grants of money from the Pharmaceutical Society; on the other, Mr. MACKAY showed how much the failure of such efforts has been due to the want of interest on the part of those for whose benefit their establishment is sought.

Mr. GILES also reminded the meeting that although the Society was established to promote pharmaceutical education, it was not intended to be an educating body, the providing of education having rather become associated with it from the circumstances of the time. However great may be the temporary difficulty in dealing with this question, it is probably, as Mr. ATKINS remarked, one that will ultimately determine itself, and that most satisfactorily, when pharmacists, as a body, throughout the kingdom, are themselves thoroughly educated. This is in accordance with the President's opinion, expressed in his address, that the visit to the Society's school should be the polish which should follow scholastic duties and the ordinary instruction in the shop. Professor REDWOOD also, in his reply on behalf of the "School of Pharmacy" at the dinner, said that he looked upon the influence of the trained men leaving that school as constituting so many local schools of pharmacy dotted throughout the country.

Another subject mentioned was the cost of this Journal to the Society; and it must have been satisfactory to one who has so identified himself with its finances as Mr. JOHN MACKAY, to be able to say that the apparent deficit of £164 in the Balance-sheet represents the entire cost, including postage, of about 4000 copies that are supplied gratuitously every week.

The early closing movement was also alluded to with general approval; and we are glad to be informed that many firms intend availing themselves of the "bank holiday" next Monday, an example which we hope will next year be universally followed.

THE JURIES BILL.

ON Monday night the Government Bill for dealing with the law relating to Jury Service was read a second time. The bill is one that has been awaited for some time with considerable anxiety by the pharmaceutical body in consequence of the efforts that have been made to secure the extension of the exemption from service, hitherto limited to pharmaceutical chemists, to all chemists and druggists on the Register. It is gratifying to find that this point has been so far gained that, among the persons whom it is proposed by clause 5 of the Bill shall be "absolutely exempted from serving upon any juries "whatsoever," are "apothecaries, certificated by the "Court of Examiners of the Apothecaries' Company, "and all registered medical practitioners and *registered chemists*, if actually practising as apothecaries, medical practitioners, and registered chemists respectively."

It is with satisfaction that we are able to record the fact that the Solicitor-General has, in accordance with the suggestion of our Council, made this exemption one applying to the trade at large.

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

May 15th, 1872.

MR. A. F. HASELDEN, F.L.S., PRESIDENT, IN THE CHAIR.

Present,—Messrs. Atherton, Betty, Bottle, Brown, Carr, Frazer, Greenish, Groves, Hills, Mackay, Reynolds, Sandford, Savage, Shaw, Smith, Stoddart, Sutton, and Williams.

The SECRETARY presented a list of 50 members, etc., whose subscriptions had been tendered subsequently to the 30th of April.

Resolved—That they be restored to their original status upon payment respectively of a nominal fine of one shilling.

The Council considered notices of motion which had been received for the Annual General Meeting.

The business for the Annual Meeting was arranged.

The Council adjourned to the Annual Meeting.

THE THIRTY-FIRST ANNUAL GENERAL MEETING OF THE PHARMACEUTICAL SOCIETY.

Wednesday, May 15th, 1872.

MR. A. F. HASELDEN, F.L.S., PRESIDENT, IN THE CHAIR.

The Thirty-first Annual General Meeting of the Pharmaceutical Society of Great Britain was held at 17, Bloomsbury Square, on Wednesday, May, 15, 1872, at twelve o'clock.

The SECRETARY having read the notice convening the Meeting, the President delivered the following address:—

Gentlemen,—Again it is my privilege to address you at this our annual gathering, when we meet to express our opinions of the past and our wishes respecting the future,—a time when we see face to face many whom we had known only in imagination, whom we had pictured perhaps in the mind's eye from what we had heard of them or from the tenor of their writings. May all that has been good and kind in our ideal portraitures be fully realized; and if by chance there have been any stray marks of a contrary character, may they fade rapidly away,

> "Melt into thin air,
> "And like the baseless fabric of a vision,
> Leave not a rack behind."

I purpose limiting my observations to subjects which concern this Society, principally those which have been brought prominently before us during the past year. Education stands out in bold relief. The primary objects of the founders of the Pharmaceutical Society were the advancement of chemistry and pharmacy and promoting a uniform system of education of those who should practice the same, viz., the dispensers and vendors of medicines to the general public. Some may hold the opinion that the Society has not accomplished as much in this direction as they had looked for; but, turning to the pages of the 'Pharmaceutical Calendar,' and counting up some scores of names of good men and true who have taken our prizes between the years 1842 and 1872 —Robert Bentley the first upon the list, followed by many others, George F. Schacht prominent amongst them —who, some in the metropolis and some throughout the country, both by precept and example have promoted and are still promoting the cause of education, can I, can you, ignore this, and accept the opinion that our Society has accomplished so very little? That it may do more, and that the time has arrived when it should do more, is an accepted fact. With the view of promoting pharmaceutical education, lectures were given in the earliest days at the Society's House; many professors whose names are held in honour by us at first gratuitously assisted these praiseworthy endeavours. Later on, the laboratory was established for practical chemistry, and thus, so far, education was promoted; and I shall be truly sorry to see the day when the young who come from all parts of the country to Bloomsbury Square to attend lectures and work in the laboratory (the best, I believe, in the United Kingdom) are sent ruthlessly away to obtain this particular course of study where they can. But this can hardly be called the education of a youth; it is simply the polish which should follow scholastic studies and ordinary instruction in the shop. I do not and cannot look upon the Society as being in the anomalous position ascribed to it by some of acting at one and the same time as an educating and an examining body. The professors who deliver the lectures and the director of the laboratory are not members of the board of examiners, and the examiners are by no means bound to shape their questions in accordance with any special class-book, but rather upon a general acquaintance with and practical knowledge of the subject, whilst dispensing and the reading of prescriptions form no portion of the laboratory course of instruction or of the lectures delivered.

It will naturally be expected that I should not pass over the examinations without a word of comment,—substantially the Report of the Council contains all that is necessary. Experience has taught me that no examination can by any possibility please all parties, especially in the transition state through which we are at present passing; although more than three years have elapsed since the Pharmacy Act of 1868 came into force, that fact is, I think, scarcely realized by all who are interested therein. The questions for the Preliminary Examinations have been frequently adverted to by writers in the Journal, but whether they be based upon the system of teaching in use a quarter of a century ago, or upon that of the present day, the result has hitherto been the same. Although the number of failures is great, other examining boards experience similar averages. With respect to the Minor and Major examinations, I am of opinion that by no other system, and no other class of examiners, could they be more efficiently carried out; it may be found desirable after another year to make the Minor examination in chemistry a little more practical, and of which proper and timely notice would be given. I pass on now to consider briefly education in connection with provincial associations. One wish I believe pervades the whole pharmaceutic body; viz., that these associations should be encouraged, and some portion of the funds of the Society should be placed at their disposal,—the question for the future being, how shall it be carried out so as to be well done? For myself, without approaching details, I would say let it be done in a liberal spirit; let it be accomplished in such a way that those who are at present not of us, or with us, shall be constrained to join us in simple acknowledgment of the good things we have desired to do; and from the seed so sown, I shall confidently look for an abundant harvest. I remember well the old proverb, "There is that scattereth and yet increaseth, and there is that withholdeth more than is meet, and it tendeth to poverty."

The consideration of this point leads me on to another —early closing—inasmuch as "time for study" has been so frequently and persistently given as a reason for it. The advocates of early closing are in the main right. But look at it in its true light. Are two hours a day after the shop is closed the only and the proper time for study? I think not; the apprentice should virtually be studying during the hours of business, that is, he should pay attention to all that occurs in connection with his avocations during the day: not a root, bark, seed, gum, powder or liquid which comes in, should pass unnoticed at the proper time; not a process in the preparation of anything should pass unheeded if it could be conveniently attended to; and then when evening and the hour of closing come, he should devote a portion of this time to reading about those substances with which he has had to do during the day. The assistant, the skilled assistant, whose services are paid for, let him also have his share of time for keeping up his stock of knowledge. But, false modesty apart, has not the Early Closing Movement another object in view? Clearly it has, and properly so; mind and body require not only relaxation from labour, but also recreation, and for that, in moderation, time should also be given.

"Quondam citharâ tacentem
Suscitat Musam, neque semper arcum
Tendit Apollo."

There is yet another subject equally well worthy of our consideration, I mean that of prices; a theme upon which writers have constantly expatiated through the medium of our Journal. It is truly becoming a serious question that whilst the education of the pharmacist is much more costly, remuneration from a variety of causes is less satisfactory. This, like early closing, should be arranged amongst ourselves, by the requirements of the consumer and the locality; a poor man could scarcely be expected to pay after the same rate as a wealthy one, or the extreme East of London the same as the West Central. High rents, and the cost of conducting, must influence prices in different neighbourhoods; by mutual arrangement amongst ourselves, both consumers and vendors may be equally satisfied. It is a large question, too much so to be fully and fairly treated upon in this address; it is a matter upon which we cannot legislate, but upon which we may be agreed.

There is a subject I should like to mention, which has come to my notice this morning. The Juries Bill, which is before the House of Commons, has passed the second reading, and has been ordered to be printed. As it stands now, all registered chemists and druggists in England will be included in the exemption from Juries. Still, we must not raise our hopes too high, because it is quite possible that some member of the House of Commons may object to it on the third reading. Nevertheless, it is a source of congratulation.

I can refer with satisfaction to the monthly evening meetings which have been held in our lecture-hall. Upon no occasion since their commencement in October has there been any lack of subjects, and not once has the discussion flagged, but rather has been maintained beyond the ordinary time for breaking up. The attendance has been uniformly good.

The Hills Prize of books, given monthly to the candidate who passes the minor examination highest in honours, was a new feature in our report last year. It is a gratification to be able to say that a candidate has never been wanting equal to the task of gaining it, and good useful books have invariably been selected by the prizeman.

More exertion has been made on behalf of the Benevolent Fund, and already the number of subscribers from the country is in excess of last year by 138 names; the amount from all sources up to this date exceeds that received during the whole of last year. This, so far, is satisfactory, but it may be a matter for consideration whether its funded capital might not be more profitably invested and with equal security, so that independently of subscriptions a larger income might be available. Thus, whilst earnestly desiring that the demands may be few, there may be the means, when deserved, of relieving generously.

It may be observed that four members of Council have voluntarily retired this year—Messrs. G. Edwards, Groves, Reynolds, and Woolley. I cannot refrain from saying a word or two, especially of Mr. Edwards (I regret, absent this day from indisposition), who has been upon the Council continuously since the year 1847 until now; twice during that time Vice-President, also a member of the board of examiners from 1864, he has served our Society well and faithfully. During thirteen years at the Council-table I have profited by his matured experience, and I could not let him leave us without a "God speed!" and an expression of regret. Younger heads may be desirable, but Nestor and Ulysses are as requisite in the Council-chamber as Achilles and Ajax on the battle-field.

Already I feel that I have detained you too long; a word or two more and I finish.

When I first took possession of the presidential chair, I felt that I was scarcely equal to the duties, but I determined, whatever the result might be, that I would do the work cheerfully; and now, at the close of the year, I thank my fellow-councillors and our indefatigable Secretary for the assistance they have uniformly and upon all occasions afforded me, and let me repeat that the interest I have ever felt in the progress of the Pharmaceutical Society has not abated, and I trust never will be diminished.

The President then called upon the Secretary to read the Report of the Council. It was resolved that the Report be taken as read.

REPORT OF THE COUNCIL.

The Council, after a year of anxious and arduous labour, have now the satisfaction of meeting their fellow-members, and presenting the annual report. Comparing the financial statement with that of 1870, an increase of between six and seven hundred pounds will be observed in the receipts during the year from sources whence such increase might be legitimately expected, viz: from the accession of Members, Associates and Apprentices, and from the receipts for the insertion of advertisements in the Pharmaceutical Journal, and the proceeds of its sale.

It may be well to bear in mind that although the number of members may be augmented from year to year, one item of income must naturally diminish as time goes on. The entrance fees of chemists and druggists who were in business prior to the passing of the Pharmacy Act, 1868, will ultimately cease. Thenceforward, pharmaceutical chemists only, men who have passed the Major Examination, can become members. Considering, however, the great extension of the two other classes of the Society, Associates and Apprentices, which has been going on during the last two or three years, it may reasonably be hoped that a very large proportion of the rising generation will secure for themselves the highest position and title, that of Pharmaceutical Chemist—a title becoming every day better understood and more highly appreciated by the public—and having achieved that object of ambition, will naturally desire to become members of the Society, and participate in all the privileges which it can confer. Even of those who are content to rest on the Register as "Chemists and Druggists," and as "Associates" of the Society, many will probably secure for themselves the right of taking part in its proceedings by payment of the same annual subscriptions as members.

It will be observed that the fees paid by laboratory students in 1871 were not equal to those of the previous year; but there was not a corresponding falling off in the number of pupils. Many students work in the laboratory for "part time" only, probably from inability to attend the whole course. To those, however, who can devote the necessary time the Council would earnestly recommend the entire course of laboratory instruction.

The Council have during the past year paid great attention to the library; and many books carefully selected by the Committee have from month to month been added

Dr. FINANCIAL STATEMENT FROM JANUARY 1ST TO DECEMBER 31ST, 1871. Cr.

Dr.		£. s. d.	£. s. d.
Balance in Treasurer's hands, January 1, 1871			69 18 0
Balance in Secretary's hands, January 1, 1871			16 16 3
Life Members' Fund . . . . Fees		5 5 0	
Interest		86 10 1	
			91 15 1
Government Securities . . . Interest			299 12 6
Subscriptions:—			
1797 Members, Pharmaceutical Chemists		1886 17 0	
563 Members, Chemists and Druggists		591 3 0	
106 ,, ,, elected 1871	£111 6 0		
406 Entrance Fees	222 12 0		
		333 18 0	
161 Associates in Business		169 1 0	
566 Associates not in Business		297 3 0	
613 Apprentices		321 16 6	
Arrears		37 16 0	
			3637 14 6
Fines on Arrears			6 13 0
Laboratory . . . Fees			753 16 4
Lectures . . . Fees			189 0 0
Registration Fees:—			
50 Pharmaceutical Chemists, Major Examination		262 10 0	
234 Chemists and Druggists, Minor Examination		739 4 0	
123 Chemists and Druggists, Modified Examination		129 3 0	
802 Apprentices, Preliminary Examination		1684 4 0	
621 Examination Fees		652 1 0	
40 Registration Fees as Chemists and Druggists in Business		210 0 0	
10 Jury Certificates		0 10 0	
			3677 12 0
Stationery,—Sale of printed matter			25 19 7
Sundries,—Sale of Tin Cases for Diplomas			1 11 6
'Register,' Sale of			179 7 6
			£8,949 16 3

Cr.			£. s. d.	£. s. d.
Advertisements				9 15 6
Apparatus				20 5 2
Annuities:—Dr. Redwood				100 0 0
Carriage				4 0 9
Certificates of Death				7 7 3
Commission, Collecting Subscriptions, etc.				43 4 9
Conversazione			196 11 4	
Pharmaceutical Meetings			26 5 6	
				222 16 10
Examiners, Boards of (England and Scotland)				869 16 10
Fixtures and Fittings				80 12 3
Furniture				30 7 0
Government Securities:—Purchase of £1000 New Three per Cents.				912 10 0
Life Members' Fund. Purchase of £110 New Three per Cents.				103 2 6
Grants to Provincial Associations				48 8 0
Gratuity to Mr. Barnard				100 0 0
House Expenses				67 10 6
Journal Balance of Account				164 9 7
Laboratory:—				
Director's Salary	200 0 0			
Percentage on £749 0s. 0d., Fees received during 1871	187 5 0			
		387 5 0		
Demonstrator's Salary	100 0 0			
Percentage on £749 0s. 0d., Fees received during 1871	74 18 0			
		174 18 0		
		562 3 0		
Assistant Demonstrator's Salary		80 0 0		
Porters' Wages		85 16 0		
			727 19 0	
Chemicals, &c.			228 7 6	
				956 6 6
Law Costs				176 2 3
Lectures:—				
Professor of Chemistry and Pharmacy			300 0 0	
Professor of Botany and Materia Medica			300 0 0	
Subscription to Botanical Gardens			21 0 0	
Prize Medals, etc.			6 18 1	
				627 18 1
Library				59 12 11
Museum:—Curator's Salary			100 0 0	
Specimens and Sundries			97 1 7	
				197 1 7
Expense of the Society in Scotland:—Balance due to Mr. Mackay for 1870			55 6 6	
Grant for current expenses for 1871			100 0 0	
				155 6 6
Postage				164 3 7
'Register,' Cost of Publication				178 12 4
Repairs and Alterations				548 16 4
Rent, Rates, and Taxes				400 18 3
Repayments (Returned Subscriptions to Associates)				12 1 6
Stationery, Engraving, Printing, and Office Expenses				352 4 7
Salaries:—				
Secretary and Registrar			450 0 0	
Assistant-Secretary and Deputy-Registrar			200 0 0	
Clerks and Servants			533 0 0	
				1183 0 0
Sundries:—				
Diploma Cases			21 0 0	
General			16 7 6	
Books for Prescriptions			10 0 0	
				47 7 6
Travelling Expenses (Country Members of Council)				319 12 6
Refreshments for Council				17 10 6
Local Secretaries' Expenses				6 9 2
Balance in Treasurer's hands				758 1 9
Balance in Secretary's hands				4 3 6
				£8,949 16 3

We, the undersigned Auditors, have examined the Accounts of the Pharmaceutical Society, and find them correct agreeably with the foregoing statement; and that there was standing to the account of the Society, at the Bank of England, on the 31st December, 1871:—

General Fund	New 3 per Cents.	.... £11,200 0 0		
Life Members' Fund......		.... 3,000 0 0		£14,200 0 0
Benevolent Fund	Consols.	.... 12,000 0 0		
Pereira Memorial Fund...		.... 100 0 0		12,100 0 0
Bell Memorial Fund	Do.	....		2,050 0 0
Secretary's Casual Relief Fund	Do.	....		105 0 0
The Hills Prize Fund	Russian Bonds.	....		200 0 0

Frederick Barron,
William Bower,
William Hodgkinson, } *Auditors.*
John B. Mackey,
William Squire,

February, 2, 1872.

BENEVOLENT FUND, 1871.

	£ s. d.	£ s. d.
To Balance in Treasurer's hands (Jan. 1, 1871) . . .		85 0 1
,, Dividends on invested capital.		345 0 0
,, Donations	£74 7 10	
,, Subscriptions	594 3 6	
		668 11 4
		£1098 11 5

	£ s. d.	£ s. d.
By 11 Annuitants, each receiving £30 per annum.	330 0 0	
,, One quarter's Annuity, to Lady Day (*Annuitant now deceased*)	7 10 0	
,, Two months' payment to Christmas to two Annuitants, elected October, 1871 . .	10 0 0	
		347 10 0
,, Registered Chemist and Druggist, at Leicester, age 73 (second grant)	5 0 0	
,, Member, late residing in Sussex, age 61 .	12 0 0	
,, Registered Chemist and Druggist, at Sheffield, age 64	10 0 0	
,, Widow of a late Annuitant, age 63 . . .	10 0 0	
,, Orphan Daughter of a late Member at Southampton (fourth grant)	10 0 0	
,, Widow of a late Member at Bromyard, age 50.	20 0 0	
,, Widow of a late Annuitant, age 63 (second grant)	10 0 0	
		77 0 0
,, Premium on the Orphan Bentley's Policy of Assurance	1 11 2	
,, Advertisements	1 0 6	
,, Postage.	0 16 4	
,, Printing and Stationery	3 0 0	
		6 8 0
,, Purchase of £500 Consols		468 15 0
,, Balance in Treasurer's hands (Dec. 31, 1871) . . .		198 18 5
		£1098 11 5

Consols, 31st December, 1870	£11,500 0 0
Consols, purchase of, as above	500 0 0
Total invested Capital	£12,000 0 0

We, the undersigned Auditors, have examined the above Account, and find the same correct.

Frederick Barron,
William Bower,
William Hodgkinson, } *Auditors.*
John B. Mackey,
William Squire,

February 2, 1872.

thereto. For the greater convenience of readers, a complete catalogue is now in preparation. In the hope that many who are closely engaged during the day would avail themselves of the opportunity of reading if the library were accessible during a part of the evening, it was arranged in January last that it should, as an experiment, be kept open on two evenings in the week from eight till ten o'clock. The total number of attendances up to April 30th was 171, and the evening average about six. The Council look forward to a larger attendance should the present early closing movement be generally responded to, and the advantages thus offered be more fully appreciated.

Under the superintendence of the Library, Museum and Laboratory, and House Committees, new cases necessary for the proper arrangement of the various specimens have been added to the museum, and in the basement of the Society's House extensive alterations have been made, by which greater convenience has been afforded to the professors and the curator for carrying on their work in connection with the museum and the Society generally.

The maintenance of correct Registers of Pharmaceutical Chemists and Chemists and Druggists must ever be a matter of great importance. It is a duty imposed on the Registrar and Council by the Pharmacy Acts. Several sections of the Act of 1868 refer exclusively to this point; and it is therein provided that the printed copy of the Register to be issued annually "shall be evidence in all courts, and before all Justices of the Peace;" consequently, copies of the Register are supplied by the Government to magistrates, coroners, and others. Cases of doubtful registration are from time to time brought before the Parliamentary Committee by the Registrar for investigation, and reported on according to their merits; whereupon, the Council, as may have been seen in the monthly reports, order the erasure of names improperly inserted. But there is a still more laborious work thrown on the Registrar. Although it is the duty of every Registrar of Deaths to send notice to Bloomsbury Square of the decease of Pharmaceutical Chemists and Chemists and Druggists which may occur in his district, many names still remain on the Register of persons who cannot be found at the addresses given; and it has therefore recently been deemed necessary to issue 1262 registered letters according to the 10th section of the Pharmacy Act, 1868, in order that the list may be freed from errors. Should the application lately made for the extended exemption from jury service be successful, a still greater necessity for accuracy will arise. The Council would urge on every chemist changing his residence to send his new address at once to the Registrar. A classified Register, according to towns, is in the course of preparation; it is found to be a work of great labour. The Council, however, trust that in a short time it will be completed.

The subject of Exemption from Service on Juries by all Registered Chemists and Druggists has been considered; and after the resolution passed by the Council in April, immediate steps to secure that exemption were taken. The Council sincerely hope that a request so reasonable and important in the interests of the public will be granted.

The granting of aid to provincial associations for facilitating the technical education of assistants and apprentices unable to avail themselves of the opportunities afforded by the Society in London, has engaged the attention of the Council. It is eminently one of considerable difficulty, requiring much careful thought, for whilst the desirability of carrying out such a project is generally admitted, it is obvious that it should be done equitably, and to be done equitably, it must be done systematically. The claims of small towns should be considered as well as those of large ones; and, indeed, at first sight, the larger would seem to require help less than the smaller.

The Council regret that the regulations which have been agreed to from time to time by the Council, on the recommendation of the Provincial Education Committee, have not worked as satisfactorily as could be desired. An alteration was agreed to by the Council at its last meeting, the effect of which will be to remove the restrictions which the Council believe have prevented the full benefit originally anticipated. The whole question, however, must be more fully gone into by the incoming Council.

The Council invite attention to the result of the examinations of the past year, as shown below. The examinations will always be a matter of the greatest interest to Pharmacists, and importance to the well-being of the Institution.

	Presented themselves.	Passed.
Major	70	50
Minor	371	234
M dified	190	123
Preliminary	1163	766

The Council having fully considered the nature of the examinations, believe them to be sufficient for the present requirements. The preliminary examination has received especial attention; and a report was published by order of the Council, by which it is hoped that all who have to undergo the ordeal will be greatly assisted.

The Council desire to draw attention to a regulation recently issued that these examinations should be held simultaneously throughout the kingdom. Representations had been made that on more than one occasion the questions propounded to the candidates at a place where the examination was held in the morning were telegraphed to another place at which the afternoon was fixed for holding it. As the questions for each examination are alike throughout the country, this irregularity is such an evident source of mischief, that it was imperative to check it. For this purpose it is now arranged that these examinations shall be everywhere held from 10 A.M. to 1 P.M. on the appointed days.

The Benevolent Fund as usual has claimed and received its share of attention; the receipts during the year are larger in amount from interest in invested property, and, at the same time, several new subscribers have been added, evincing—what is most desirable—the sympathy of the many. In order to keep it more prominently before the members, a pamphlet, setting forth the objects of the fund, rules, etc., has been published and distributed; and the subscriptions and donations are also published monthly. It is hoped that by these means the fund during this present year will be much increased.

In accordance with the expressed wish of the Society, a reporter has been in attendance at all the Council meetings of the year, taking full notes of the proceedings; and such portions as the Publication of Council Minutes Committee deemed proper have been published in the Journal; the whole being carefully preserved for reference if required at any future day by the Council. In carrying out this part of their duty, the Committee have been governed by the general interest of the members of the Society, avoiding as far as possible the publication of matter partaking more of the character of private than public business.

The Council desire to tender their hearty thanks to those gentlemen who have performed the important, and sometimes difficult, duties of Local Secretaries.

The members of the Parliamentary Committee have met regularly, considering most attentively all cases which have come before them, endeavouring without being needlessly stringent to restrict the illegal sale of poisons by unqualified persons, and protect the titles of Pharmaceutical Chemist and Chemist and Druggist.

The Petroleum Act of 1868 contained restrictions as to the keeping of petroleum that were found to be particularly oppressive and vexatious when applied to the storing of Benzol and allied preparations in small quantities; and it is satisfactory to be able to report that Clause 7 of the Petroleum Act of 1871 contains the exemptions promised to the deputation which waited on the authorities at the Home Office, and removes these restrictions. A Bill, relating to the adulteration of food and drugs, has been introduced into Parliament by Mr. Muntz, containing clauses that would be prejudicial to the interests of the pharmaceutical body. At present, its progress has been postponed, to allow of the subject being dealt with in the Government Public Health Bill. These Bills will require the careful attention of the Parliamentary Committee.

For some time past the Pharmaceutical Society has had but very insufficient accommodation for carrying on its affairs in Scotland, and more especially for conveniently and properly conducting the examinations. This fact has long been felt by the Council; and they received at their meeting, on November 1st, a letter, which was afterwards published in the Journal, from their former esteemed colleague, Mr. Henry Deane, representing that the rooms occupied by the North British Branch in Edinburgh were altogether inadequate to its requirements. After due consideration, the Council authorized Mr. Mackay, Hon. Secretary, to make inquiries with the view of obtaining premises more worthy of the Society, affording proper and sufficient accommodation for conducting the examinations, and large enough for a library and museum. The Council are pleased to be able to say that such premises have been obtained, and are now being arranged; and they believe that this will be a great benefit, not only to members, but also to associates and apprentices who go to Edinburgh to study and pass their examinations.

The Conversazione held last May at the South Kensington Museum, by permission of the Lords Commissioners of the Council of Education, afforded great gratification; and your Council have made arrangements for a similar one on the evening of the day upon which the annual meeting is held.

The Council feel pleasure in congratulating the members of the Pharmaceutical Conference on its steady increase in favour and importance, and on its "Year Book," which affords an excellent record of all important facts relating to the pharmacy of the year; and, although officially unconnected with the Pharmaceutical Society, there can be no doubt that the two bodies should be in strict unison, as their objects are similar, and most of the active spirits of the Conference belong also to the Society.

In the sad disaster which befell Chicago, the College of Pharmacy there established was destroyed. It is gratifying to reflect that the pharmacists of England were reckoned upon—and not in vain—to assist their unfortunate fellow-labourers; the appeal has been well responded to, in contributions both of books and money.

The emphatic condemnation of compulsory "Poison Regulations" by a very large majority of the trade, and the active steps taken by your Council and others to give weight and effect to the voice of the country in reference thereto, produced the desired result, and induced the Government to withdraw their Bill for imposing upon chemists and druggists further restrictious in the keeping and sale of poisons. This projected measure was an object of frequent and anxious deliberation with your Council, who cannot close this Report without expressing their feeling of satisfaction that the excitement and antagonism of the first few weeks of their official existence steadily and speedily disappeared on the withdrawal of Mr. Foster's Bill which had provoked it, leaving them to pursue uninterruptedly the business, and they hope, advance the true interests of the Society.

The following registers were placed before the meeting:—

Register of Members, Associates and Apprentices of the Society.
Register of Pharmaceutical Chemists.
Register of Assistants.
Register of Apprentices or Students.
Under the Pharmacy Act, 1852.
Register of Chemists and Druggists.
Under the Pharmacy Act, 1868.

Mr. Wilkinson (Manchester) said: Mr. Chairman and gentlemen, I have the honour of being asked this morning to move the adoption of the Report, and I wish that it had fallen into abler hands. I have come here quite unprepared to do anything of the kind. I will not call your attention to the various paragraphs of the Report, because I think there are a good many gentlemen here who have got something to say upon some of them; at all events I do not wish to take it out of their hands. I find that the finances are in a very satisfactory condition; that we have a balance in the treasurer's hands of £700. I find the Benevolent Fund is also in a satisfactory condition. The first paragraph is very satisfactory; that we have received from various sources £600 or £700 more than we received last year, and we hope that such a course will continue. I leave it to gentlemen who are prepared to speak upon the subject, and simply move,

"That the Report of the Council now read be received and adopted, and printed in the Journal and Transactions of the Society."

Mr. Atkins (Salisbury): Mr. Chairman and gentlemen, I rise to second the motion. I can say with Mr. Wilkinson that I am entirely unprepared to speak upon this occasion, having only just been requested to second the adoption of the Report. I, however, can say that I do so with a very great deal of pleasure. I think the Report, whatever exceptions may be taken to parts, —I have no exception myself to take to it—is an admirable one, and should be a source of entire and deep satisfaction to us who take an interest in the well-being of pharmacy. There are gentlemen who, no doubt, will speak upon points which they have made specially their study, and I will only say one word with regard to a topic upon which I have been making some investigation, namely, the question of provincial education, or rather apprenticeship. However admirable the work which the Society is doing, and it is doing a very great work, and doing it well, I cannot say I that think the figures in respect to the examinations are at all satisfactory. I think that the failures in the Preliminary examinations are a source of very considerable anxiety. It is a source I may say of very considerable depression to those who unfortunately attempting the ordeal fail, and to those who are parents and guardians of such as do fail. I think it would be most unwise on our part as a body to relax or lower the standard of Preliminary Examinations, but I must be allowed to repeat now that which I have written—the absolute importance of the Preliminary examinations or their equivalents being passed before apprenticeship commences. I hold it is not our duty; we are not called upon to investigate, to instruct, to analyse the results of a classical or liberal education; and surely the Preliminary examination is placed I may say so low, that we cannot speak of the education as a liberal one or a classical one which fails to pass that limit. Provincial education is a great subject. I was struck, Sir, with the discretion, prudence and thoughtfulness of your own remarks. They quite echo my own feelings. Something, doubtless, will be done, and no doubt by the incoming Council it will be maturely considered. However, I cannot but feel the force of another remark you made, that we are now passing through a transition period. The question of provincial education will ultimately determine itself, and that most satisfactorily when we, as a body, throughout the kingdom, are ourselves thoroughly educated. I do not refer for one moment to a liberal or classical education, but I refer to technical education. No doubt, when the coming generation has become a thoroughly educated body, we shall be perfectly able to take care of the interests of our apprentices. But until that is done, there is a work indeed to be done by associated effort, and I hope the Council will give that matter their very grave consideration. I feel very deeply indeed the present position of our apprentices. I think it must be a very great regret that you find in provincial towns five or six or even more apprentices who have not passed the Preliminary examinations who are just going out of their time as assistants. There are absolutely assistants upon assistants in our provincial towns who have not passed that examination. I say they are only piling up difficulty upon difficulty, and there must be a weeding-out process by-and-by. I have great pleasure in seconding the adoption of the Report.

Mr. Atkinson Pickering (Hull): Mr. Chairman and Gentlemen,—This is the first time I have had the pleasure of attending the Annual Meeting of the Society, and I wish to put before the members of the Council the wants and the necessities of the country members. With very much that has fallen from you, Sir, I agree, but not altogether. You gave us in your own words the first paragraph of the charter of incorporation which was granted to the Pharmaceutical Society, and you stated it was granted for the purpose of promoting chemistry and pharmacy, and also for promoting a universal system of education of the members of the trade which practised that calling. I regret exceedingly to find that after the lapse of about thirty years no general system of education has been inaugurated by the Council of the Pharmaceutical Society. I do not come here to speak one disrespectful word of any of the members of the present or past Councils. We owe to them a great deal of gratitude for the time which they have devoted to the interests of the trade. I come not here to find fault with the Institution in which we are now assembled. The country members are quite as proud of it as their town brethren. But at the same time I cannot shut my eyes to the fact that as an educating institution it affords to our country apprentices and assistants but very little help. I do not altogether agree with the remark which has been made with regard to the education and with regard to the assistance which the apprentices should receive from their employers. I think it is exceedingly desirable that provincial schools of pharmacy should be established in a number of large towns, and that these schools, to make them permanent, should be assisted by grants of money from the funds of the Pharmaceutical Society. There is now a considerable surplus income, and I do not think it desirable that that surplus year by year should be invested in Consols when the great mass of the apprentices and assistants in the country need that money to be expended in promoting their advancement and education. It has been a source of regret to me that the resolutions adopted by the Council of the Pharmaceutical Society upon that subject have been attended with so little result. I attribute that smallness of result to the resolutions themselves, to grant small sums of money for the purchase of specimens of chemicals, of specimens of materia medica, or for the purpose of forming a library, which are all very well in themselves, but that is little or nothing towards what we require in the country. We do not presume to found schools of pharmacy on so broad and extensive a basis as this one in Bloomsbury Square, but the school of pharmacy which we are anxious to establish is one where lectures on chemistry, materia medica and botany shall be given, so that our apprentices and our assistants may have nothing at all to do but to come up to this institution and pass their examinations without being put to the expense of attending for six months the laboratories and lectures here. We cannot doubt the fact that the great majority of those who are apprenticed to the trade in the country are sons of people not altogether in humble circumstances, but of very moderate means. There are many apprentices in the country whose friends could not afford to send them up to London for six months to attend a course of lectures here. How are these youths to be educated? They come up and they pay a premium. The premium which they pay to the great majority of country chemists does not provide them with board and lodging. The greater portion of every day must be devoted to labour in connection with their own business. They get an abundant practical knowledge during their apprenticeship, quite as good and practical a knowledge as they can in any establishment in London. What they require in the country is scientific training, and that scientific training will be best given by lecturers who are well up in the subjects upon which they are called to lecture. I do not mean to say that we may not be able to establish a school of pharmacy in the country; but I have great doubt indeed in my own mind as to whether it can be supported permanently without grants of money from the parent Society in London. I should wish to see these schools of pharmacy on a firm and satisfactory basis, affiliated with the parent Society in London; and I should also wish that the Council, before they made grants, should be satisfied that the money is going to be expended in a satisfactory manner. I trust that during the coming year the Council of the Society will give this subject their most serious attention. Two years ago the subject was very ably brought before the members at the annual meeting by Mr. Schacht, and I regret to find that we are as far as ever from having that subject carried out. There does not seem to me, judging from the report which I have read, to be really any scheme adopted for assisting provincial education; because to lend a few apparatus for fourteen days is perfectly useless to us. I do not mean to say but that there may be some expensive apparatus for an experiment or two which might be of service; but that is not educating. The country members of the trade are quite prepared to furnish their own school of pharmacy with apparatus; they are quite prepared to provide their own library, to take their fair share of the expenses of this school of pharmacy. But they consider they are entitled to a fair share of the income of the parent Society to which they have so long contributed, and from which hitherto they have received comparatively little in return. We do not wish to undervalue the Journal which we receive every week, because it is very creditable to the Society; but at the same time it does not afford us that assistance which we require. Neither does it furnish us with the means of educating our apprentices or assistants in a satisfactory manner. After a man has devoted ten or twelve hours a day to business, it can scarcely be expected that he will devote two or three hours of an evening, which is the only time he has for social comfort in his own family, to instruct youths in the scientific portion of their business; he may afford to them time for reading, and we do that in Hull. I am glad to say that the great majority of the trade now close their places of business at eight o'clock. I have always done so since I have been in business. I stood behind a counter from seven o'clock in the morning until half-past eleven o'clock at night for two years and a half; and when I tell you that at the end of that time with a heavy coat on I did not weigh seven stone, I need not say more to show the injurious effect which those long hours had upon myself. For twelve months after I left, I was utterly incapable of doing anything in the shape of work; and I should be very sorry if I thought any young man of mine ever passed through such an ordeal as I did myself. I rejoice to tell the gentlemen here present that early closing has found a ready response in Hull; and whilst some members of the trade have not thus far seen their own interest to discontinue it, I trust that they will, and that the claims which their wives and children have upon them will be found greater than the claims of their pockets. There is another subject in the Report which I rather regret. A great deal has been said about the Benevolent Fund. Those who hear me—and there are members of my own trade here who know me well—will feel sure that I am the last man who would wish to say one word in disparagement of that fund. At the same time I quite agree that it is time the Benevolent Fund and the funds of the Society were placed in different investments. If any of us have any money—and it is a trade where very few can make money—we are very anxious to get as near 5 per cent. for it as we can. We are glad to have a little to help us to a crust of bread and a drink of water in our old age, and it is necessary to have our money so invested as to bring us in as large an income as possible. I think there have been times when the Benevolent Fund might have been invested so as to bring four and a half per cent. Do our large insurance offices invest their funds in Consols? Only until they get a better investment. I think the funds of the Society would be far better invested in another way.

Our worthy friend, Mr. Hills, who granted us money for prizes, did not invest his money in that way. Russian Five per Cents. during the Crimean War occupied a better position than our own Consols; they went down less in the Money Market. I should like to see the funds of the Society and of the Benevolent Fund differently invested. I am a plain Yorkshireman, and I have come here to speak my mind; and if I don't speak it in courteous language, the truth is, I live so far distant from Court. It is only occasionally we have the honour and pleasure of seeing our Sovereign and beloved Queen, and when we do there are no people under heaven who are more willing to render her the respect which is due to so excellent a woman than Yorkshiremen. With these remarks I am quite willing to leave the subject of Pharmaceutical Education in the hands of the incoming Council; and I trust it will receive from them such a consideration as will result in some permanent system being adopted for the permanent assistance of our provincial schools of pharmacy. We do not expect to found anything of a kind equal to the Society here in London; but when I tell you that in our present botany classes we have twenty-six students, the great majority of whom are members of the trade, I think I have given a substantial reason why we are entitled. I think it is no very bad beginning for a provincial school that twenty-six should be found willing to join its botany classses. I trust I have said something that will induce the members of the Council to give us a grant of money, for it is money that we want.

Mr. Wheeler (London): I should like to ask the previous speaker how many provincial schools he wishes to establish, and how are the outlying towns to be provided for? Are the large towns only, such as Hull, Sheffield, Liverpool, Manchester and Brighton, to be provided with provincial schools, and the small towns left unprovided for?

Mr. Pickering: I may say that we are anxious in Hull to make our school the focus of the neighbourhood; to establish lectures at such hours of the day as will enable those who reside in the smaller towns around us to attend those lectures. I myself saw a member of the society at Beverley, and endeavoured to induce him to provide means, so that a number of young men might drive over to our lectures in Hull, and avail themselves of them. I can only say that we are quite as anxious in behalf of the apprentices and assistants of the smaller towns surrounding us as we are for ourselves.

Mr. Radley (Sheffield): Sir, I have taken a great interest in the subject of provincial education, and I feel exceedingly obliged to Mr. Pickering for the very lucid manner in which he has described the requirements, opinions and feelings of the country members of this Association. In reference to the outlying small places, I have no doubt that some arrangement might be made in other places as at Sheffield. The Midland Company have offered to charge one fare from various towns in connection with our association, and I have no doubt that the same thing will take place in other parts of the country. With respect to the amount of assistance required, for my own part, I think it will be a difficult matter for this Society to undertake to form and sustain completely these country associations. Any assistance must be supplementary to a large amount of local effort. Already in various centres a large amount of money has been expended by members of various associations; and with a little encouragement from the parent Society, I am persuaded that they will still continue their efforts. It is not, as has been supposed, to give a premium to idleness on the part of these young men that we ask for money, but it is to support and assist those who are in earnest in the matter. I feel quite sure that a good feeling throughout the country will be promoted. There are persons in Sheffield who have held aloof from this Society entirely on the ground of what they have supposed to be a want of sympathy with the country associations shown by the London Society. In reference to the remark respecting the failures in the Preliminary examination, I think there is a remedy; for I find that the youths who are just coming from school, and are about entering the business, for the most part pass the examinations readily. It is those persons who have not been favoured with a generous education, and who have arrived at something like years of maturity, who fail. No doubt after a few years the number of failures will be comparatively small. Perhaps I may be allowed to make one or two remarks in reference to the Report and some other matters. I notice the statement in the Report with reference to the Journal, and it appears to cost the Society about £1000 a year. I think it is scarcely right that such a large sum of money should be disposed of in one way. It strikes me it would be desirable to have a more full and particular account. As an old member, one of the founders of the Pharmaceutical Society, I feel exceedingly gratified to find that, after all expenses have been met during the past year, there is a balance of nearly £1700 in hand. I notice that during the past two years there has been an expenditure for repairs and alterations to a very large amount. For two years the furniture, fixtures, fittings, repairs, etc., are £1368. I hope that there will be less outlay under those heads, and the funds available for educational purposes will be larger than they are. It is a matter of very great satisfaction to my own mind to find that upon the whole, the affairs of the Society are so prosperous; and I feel quite sure that any little movement that has been set on foot with reference to country education will receive a further impetus.

Mr. Mackay (Edinburgh): Allow me to say with reference to the Journal account that the balance up to Dec. 31st is represented by £164. 9*s*. 7*d*. I may mention that at the time our Journal ceased to be a monthly publication and became converted into a weekly one, it was a matter of considerable anxiety, and various calculations were made by the Council and Committee: first of all to see whether it would be desirable to change our publication from a monthly to a weekly form; and very many calculations were gone into as to whether it would please those who were interested to get a weekly publication, and if so resolved, what would be the financial position of matters. It was agreed then that very probably there might be a balance against the Society of £300, £400, or £500 at the end of the year. Notwithstanding that probable balance, it was felt that it would be a desirable thing, at all events, to make the experiment. As we all know, the change was made, and it has resulted in this, that the balance last year is less than we estimated, being only, as I have said, £164. I do not wish the gentleman who has just spoken to entertain the idea that this is a mere haphazard sum. The Secretary has gone into the whole matter, and at our Council meetings there is published a regular statement, which is headed "Journal Account," in which all matters are given, commencing with editor's salary, sub-editor's, contributors, and so on. I take it this is quite open to any member of the Society to look at; and if this meeting should so determine, I do not see any reason why the whole statement should not be printed along with next year's expenditure. But, I would press upon the meeting that the Council have not been at all careless in carrying out this Journal account. Bearing in mind the enormous weekly gratuitous circulation, equal to about 4,000 copies, the result is as I have already stated. Now, I desire to make one or two remarks upon the very vexed question of provincial education. I am delighted beyond expression that we are at one mind in this respect—that there is no difference of opinion whatever in regard to the fact, that money must be given from the parent Society to assist some of the provincial associations; but, whilst I say that, I call it a vexed question, I repeat that the proper manner of bestowing these grants is one of extreme difficulty. I have listened with great interest to the remarks which have been made by the gentlemen who have spoken, and I have read from time to time the various proposals which have been made, and I confess that I am almost in a kind of mist, and do not at the present time see my way out of the surrounding darkness; but I take it that this our Annual Meeting is one of the very best possible opportunities for opening up a path, the using of which may not only be easy, but afford pleasure and satisfaction to the next Council. I therefore take it that no positive action of any kind in connection with this subject can be taken here to-day. But we have gentlemen present who, no doubt, will do what they can, to assist those who are about to take up the affairs of the Society for another year. A great deal has been said about founding provincial schools. The claims of this Society, I need not for one moment advance in a meeting such as the present. But, turning to the Journal of May 4th, 1872, I find that in Leeds it is stated that there are in business there 112 gentlemen. Of these 112 in Leeds, there are connected with the Society 27; of associates not in business and registered apprentices, 11. We have had a sound, and not an uncertain one, from the enterprising town of Sheffield, and there I find the total number in business 100; connected with the Society, 27; associates not in business and registered apprentices, 9. I go again to Hull, the claims of which have been so ably stated by Mr. Pickering, and I find there the total number in business 102; connected with the Society 19; associates not in business and registered apprentices, 4.

Mr. Pickering: I think there is a mistake there. We have only 90 in the trade.

Mr. Mackay: As this was never contradicted, I took it for granted it was admitted as correct; but I will read it as 90.* Now this is a state of matters which I think should not be. I hope the time has passed when it will be possible for such a table to be again printed. But in connection with this statement, I cannot but feel that while the young men may have been to blame, and are to blame, there is an amount of blame attachable to the masters, to which I not only take this opportunity of drawing attention, but which I would ask them to look fairly in the face. After the passing of the Pharmacy Act of 1852, we had a visit from the late respected and venerated Jacob Bell, in Edinburgh. In 1853, at a meeting there I made a motion to the effect that, now that the Pharmacy Act was passed, small as the privileges were which it gave, masters—chemists and druggists—in taking apprentices should put in a clause in the indentures binding each youth to attend a course of lectures on materia medica and chemistry. That was seconded and carried. Observe; at that time there was no such thing as Preliminary examination. Mr. Bell made a second motion to the effect that practical chemistry and botany should be added wherever it could be done. Those two motions were passed; and they have been to a certain extent acted upon. For myself, I have always acted upon it; and, in addition, since the Preliminary examination has come into operation, I am safe in saying that I am joined by a good many, not only in Edinburgh, but out of it, who, when a parent or guardian makes an inquiry as to a vacancy in an establishment, the very first thing said is—if there is a vacancy—A. B. will be taken, but not until he has passed the Preliminary examination of the Society. Then the next point is—that being agreed—if your son, after a month's trial pleases, and likes the business, a clause shall be inserted in the indentures by which C. D., as a master, binds himself to give time to the pupil, A. B., to attend a course of materia medica, chemistry, and botany, you finding the money, C. D., as I have said, giving the time. The effect of such an arrangement is, that during the apprenticeship, a full course of these three scientific departments is made available; and if the youth during the five years' apprenticeship takes advantage of the collection of specimens to which he ought to be admitted, and occupies his spare time in reading, the great probability is that, at the end of his apprenticeship, with perhaps a course of three months' practical chemistry, or even one months' close study, he may with some degree of credit pass his Minor examination. I say again, in drawing the attention of gentlemen now present to this, that if they would follow out such plan, I believe the rejections which we see with so much regret would not be so numerous. I am quite aware I am advocating a system as to which it may be said,—That is all very well for you in Edinburgh and Glasgow, London, Liverpool, or Brighton and other large towns, but such a course could not be carried out in the small villages. It is that very fact which prevents me from seeing my way as an individual in regard to the proposed grants for education in the country. I repeat that is the very reason why I fail to see any manner in which we can justly draft to certain large towns a considerable sum of money for the purpose of founding provincial schools of pharmacy. I know it may be said—why should you refuse to establish provincial schools of pharmacy all over the country? Why should you allow pupils in London to get for one guinea what it costs us in the country three or four guineas to obtain? What is the reply? I myself would not object to see our present professors cease to get their £300 a year from the funds of this Society. Some gentlemen will be horrified at hearing me say that. But I have the conviction, and as an honest man I speak it. Turning to the annual account now on the table, I find that for years we have paid £600 a year to two lecturers, and the fees set off against the £600 come to £189, leaving a sum of £411, which you hand over to these gentlemen. I say the labourer is well worthy of his hire, and I should not wish for a single moment to see the professors paid less. My desire is to see them get more. But the question comes, in what way? I say, as a Pharmaceutical Society, we should certainly have the power to appoint our own professors, and I have no hesitation in saying that the Council of this Society should appoint Professor Redwood and give him the use of the lecture room and apparatus in our present house, and so I say with regard to Professor Bentley. But do not let these salaries be paid at the expense of parties in country towns who never will be able to take advantage of the lectures. Let the student come here and pay a legitimate price for the lectures. I venture to say from what I know of the character of the lectures given in this hall, that there is no young man who would grudge a minimum sum, say of three guineas. If that be the case, taking the numbers attending at 73 and 60, as I find them to be during the present session; and it is not at all beyond our imagination to suppose that these 73 and 60 may be increased by 20 or 30 in both cases; if, therefore, you have three guineas instead of one guinea for each ticket, your professors would then be paid more than £300 a year, and right welcome, would they be to it. It will, therefore, be apparent that I am opposed to the idea of giving large sums of money to provincial centres for the purpose of founding or endowing professorial or educational chairs. I would even go to the laboratory, and say if you appoint Professor Attfield, and give him the use of the laboratory upstairs he would, by charging his own fees, make a larger income than he at present derives, while the funds of the Society would also be benefited. I say it is the duty of the Society to do what it can to assist not only *large* provincial centres, but *small* provincial centres. But then I come to the difficulty—how is that to be accomplished? Although it has been cast aside by Mr. Pickering, I think if this

* There are 97 names given in Kelly's Post Office Directory of Chemists and Druggists; besides these there are four pharmaceutical chemists whose names are not included therein, and one associate in business.—Ed. Pharm. Journ.

Society were to establish in many places a museum, a library, rooms for meeting and even apparatus for the use of the lecturer, that would be doing great good, but I would not make these little circles surround only those who are connected with the Society. We must never forget that the young pharmacist is, after all, the individual who is to foster and increase the position of the Society; and as there must be a term and course of study for these young men, I would be disposed to suggest that under some surveillance, such as that of the local secretary or committee, the privilege of free rooms, library, use of apparatus, and so on, might be given; but let the lecturer be paid proper fees by those pupils who attended. Thus, I think that by admitting all who are studying pharmacy this Society would be doing legitimately its business. Even if you were to send down to some of these provincial centres comparatively large sums of money, and give a gentleman a lecture-room as large as this, with all its appliances, and open the door and say to the young men, Come in to the lecture, my conviction is that such gratuitous system would not draw a class; and the reason I say so is, I think, capable of proof, and is borne out very much from what my friend, Mr. Shaw, of Liverpool, stated at a very recent meeting of the Council. He said, "But although there must be from three hundred to four hundred apprentices and assistants in the town of Liverpool, these lectures have not been attended by more than half-a-dozen, while the materia medica lectures were attended by two only." Then Mr. Stoddart, from Bristol, said, "This showed we ought to be rather circumspect in this matter, and see that people tried their best to help themselves before asking assistance." Then, passing on from Bristol, we come to that most important of all the north of England towns—Newcastle; Mr. Brady states, "But where are the eight or nine, (not eighty or ninety)? I have heard more than once of a class not being held because only one or two came to it." I now go to Norwich, and there I find it stated that the attendance has been very limited. Then I go on, and come to that most important of all manufacturing towns, Bradford. I find there that our friends, Messrs. Remington and Bell, have issued a circular in which they state, "The Council of this Society feel it to be a matter for deep regret that the lectures it instituted about three years ago should be discontinued for want of support by those they were intended to benefit." I think I need read no more to give a clue to what has caused me to come to the conviction that at the present time, at all events, it is not right for any Council of this Society to make large grants of money to gentlemen who are willing and able to teach. What may be the result of this day's meeting we cannot tell. I am sure you, Sir, as well as the other gentlemen in this hall, will be delighted to hear any suggestion, and I am equally certain that those gentlemen who are about to come on the new Council will pay due respect to what may be said, because we all want, to a certain extent, information upon this important subject.

Mr. Humpage (London): Mr. Chairman and gentlemen,—As a very old member of this Society, I feel at liberty to stand up and say a few words, and what I shall say will be quite of a practical character. I must say that when this school of pharmacy was established, thirty years ago, it was to meet to a great extent a want, one which I had experienced ten or fifteen years previously. Having had an education in the country, my good father, as he thought, placed me with one of the first houses in the country, where he thought I should get a scientific education. I learnt well how to wrap Windsor soap, and after a time, Epsom salts. I went to this establishment two months on trial; and having been two years previously with my father, I was anxious to know what I was to learn; and as there were four or five apprentices there and one or two assistants, I looked about, opened my eyes, made inquiries, and I found that young men whose parents had paid 250 guineas as a premium were leaving that establishment literally knowing nothing. I said,—This won't do: my father has sent me here under the impression that I could be made a chemist of; and if I go back knowing no more than these, I shall be boxed on the ears, or something worse. I therefore at once wrote to my father. He said, "Do as you like; I leave it with you." I then took the earliest opportunity, in a very respectful manner, of saying that I had been deceived; that I had come to that institution under such and such an impression, and I found those were erroneous. The gentleman behaved like a gentleman. He said, "I did not represent you would be made a chemist of; your friends might." I said, "Well, my father has left it to me, and yesterday I was thoroughly decided by this fact. Your senior apprentice came to me and asked me a question so ignorantly that I was disgusted." I left; but I did the wrong thing in leaving, because I tumbled into another place not half so respectable, and the result was that at the end of my three years I came out little better than I went in. My father came up to London with me; he was very anxious about me. He found there was no vacancy at such places as Bell's or Allen's, and I dropped into another position, but found nothing there. When, therefore, I found a move was made to found a school where a young man whose parents were willing to pay for him could get an education which he could not obtain during his apprenticeship, and when this institution was established, I felt it was the want of the trade. What did it propose to do? Not to grant money to provincial establishments. I say that now this school is established, with eminent professors, a good laboratory, lectures, and every appliance, it is absurd to think we can get anything like it elsewhere. It has been said very justly that it is not every young man who can come to London. Admitted. But I say if a young man has served his apprenticeship in the country and he wishes to come and attend these lectures, he can come. The last five young men whom I have had the pleasure of residing with me did come from the country, and, with but one exception, they have passed the Minor examination, and two of them passed in honours. Yet they did not come up from the country with any large amount, but they were determined to help themselves. They did not ask, "How many nights can I go out, Sir?" but "I want to attend the Society." They were made of the right sort of stuff; and I say if a young man wants so much time to himself he has no right to ask for a full salary. Too many want the pudding without paying for it. I say, with a clear perception of the facts, that those young men who are panting for knowledge in the country can get it. Let there be a meeting-room or anything of the sort in the country; but let the young man come to London who knows his Pharmacopœia fairly, and he has no difficulty if he will enter into an arrangement with a chemist in, or two or three miles from, London. I would not give the evenings, but let them have the mornings; that is the time,—say from nine till one. Let them attend the Society's lectures, examine the preparations they make, make whatever inquiries they can, and I declare there is no difficulty at all for these chemists and druggists from the country passing their examinations and being a credit to this Society. The provincial friends can assist its being done. Let the young men barter for time. I should not like them to work and slave as Mr. Pickering did, till he was diminished, he said, even in his very growth. A young man with the right stuff in him need not fear getting a situation. Let young men do all they can for themselves, and this Society I am sure will help them. How can schools be established in the country? You cannot make a grant to the large towns, and leave the small towns vacant. It is no use talking about the Midland Company bringing them at half fare; it would cost double what it would to come to London, where we have this Institution and all its appliances. I say there is no difficulty in the matter, and I am sure the body of men we shall have in a few years will be a credit to us.

Mr. Clarke: Mr. Chairman and Gentlemen,—I desire to trouble the meeting with a few words; because, whilst the facts which Mr. Mackay has stated with regard to provincial schools are decidedly true, there is something to be heard on the other side. I can give some information with regard to Leicester. We formed an association for assistants and apprentices there, and for the last two or three years the increase has been steady; the average is from fourteen to fifteen every evening, which I think remarkably good considering that in the whole town there are not more than from forty-five to fifty. Thirty out of the whole fifty have joined the society. Again, at least as many young men as we could expect in such a town have passed the examinations of the Pharmaceutical Society, including both the Preliminary and Major. And I take this opportunity of referring to a fact which shows the very bad working of the regulations with regard to grants to provincial associations. The Leicester Association had the pleasure of receiving a loan of £10 from the parent Society, but its reception was attended with far more trouble than it was worth. A great part of the money was expended in books, but such a number of letters had to be written to our esteemed Secretary that it caused so much annoyance that it was generally voted a nuisance. Now it is very evident that if the Pharmaceutical Society finds the money for the provincial grants, it should be spent in the very best way possible. None of us would like to see some works or materials bought by one association at 25 per cent. less than was paid by another. The books purchased by the Leicester Association were bought at the published prices, less 25 per cent. discount; but the mother association out of a similar grant has paid the full price for the books. Such facts ought not to exist, and I thought it perhaps might do good to mention them.

Mr. Berdoe (London): Sir,—I cannot allow this discussion on provincial education to pass without uttering my protest, feeble though it be, against a great deal of the language I see used about the work apprentices and assistants are compelled to do. I constantly hear and read that the opening of the shop, sweeping out and cleaning it and so forth, are derogatory to the position of persons in a pharmaceutical establishment. But I maintain that the work necessary to be done in a chemist's shop is really of the most essential importance to the acquirement of business habits, carefulness, and scrupulous neatness and tidiness. I cannot tell you how indignant I feel when I read letters in the Journal from young men who complain that they are kept rolling pills and stirring ointments, and doing those thousand-and-one things necessary to be done. I am certain that the spirit which those remarks calls forth is very detrimental to the best interests of the young men themselves. I hope you will not consider me egotistic if I just refer to my own career. I was apprenticed in the country with one of the founders of the Society, and in about two or three months my emyloyer said I had better connect myself with the Pharmaceutical Society at once. My master did not liberate me from opening shop at the proper time and doing the necessary amount of brass cleaning and so forth. But he encouraged me to get up very early in the morning, go out botanizing, and when the shop was shut he was very much annoyed if he saw me reading anything but scientific books. I may say here that I never found cleaning windows, cleaning brass plates, or washing bottles interfere with scientific education; in fact, I rather think one assists the other, and incline to the belief expressed in Dotheboy's Hall, that you may learn botany whilst weeding a garden. I used to get up early in the morning, and succeeded ultimately in passing examination as a pharmaceutical chemist. Therefore, I say that I totally object to the remarks which I constantly see with reference to that subject; and if young men desire scientific education, they can get it without putting the Society to the expense of establishing in every little village a school of pharmacy.

Mr. Schacht: Sir,—At the risk of being thought somewhat intrusive upon this subject, I shall venture to say a word or two, as one seems to be a little challenged to suggest something for the consideration of the next Council in the way of a practical solution of the difficulty, which so clear a head as Mr. Mackay's fails to see a way out of. It is a matter to me of excessive pleasure to find how general appears to be the feeling that this Society should do more than it has hitherto done for the cause of provincial education; and I desire to elicit something like a general opinion upon the subject for the guidance of those who are to have the future conduct of the Society. The first thing to be made clear in one's own mind is the general principle that should guide the Society in the education of its members, and around which should ultimately group all its efforts. I would rather that there were no such question as provincial pharmaceutical education; but, inasmuch as it is a subject which has received a certain amount of practical elucidation at the hands of this Society, we must deal with it. The difficulty which seems to strike most of those who have thought upon the matter is, that whereas it seems to be granted on the one hand that the provinces have a perfect right to receive money aid from this Society; on the other hand, it is seen that those who have the management of the funds of this Society should exercise the greatest care that none of it should be misapplied. Therefore it is that we hear these very natural suggestions as to the difficulty of establishing and maintaining provincial schools, inasmuch as it appears to be somewhat unjust, when you are seeking for an abstract principle to guide you, that Liverpool, Bristol, Hull, and a few other great centres only should be blessed with the privileges and advantages which we are striving to obtain out of the funds of the Society. Therefore, one seeks for some sort of plan which shall not be open, at any rate, to that worst of all possible charges—injustice. I can find but one solution, and that is a system which should simply grant aid for results; nothing in anticipation of what may be done, but as an acknowledgment of what has been bone. It occurs to me that such a plan as that we have cut and dried for our adoption. It is the system adopted by the Government for aiding scientific education. I have been bold sometimes in expressing my views upon this subject. I find that I have been misunderstood amongst my friends. My notion is not to do anything hastily, but adopt a plan which shall ultimately obtain throughout. But, in the meantime, I would not touch the processes which are going on in this school for a moment. It has worked good things in the past, and let us hope it will continue to do so. It would be a great pity to disturb all that is systematized in this establishment; but if we can get a system which shall simply pay for results, and it is found to work well, we can gradually bring this establishment into precisely the same system. It is scarcely necessary; it would be unwise to go into details; but any system adopted should be one that would foster the establishment of provincial schools by local effort, by some process similar to that adopted by the Science and Art Department of the State. Examinations should be yearly held in the three branches, materia medica, chemistry, and botany, or perhaps only two. All provincial schools should be recognized, and required to have a systematized process of teaching; and all those who passed should earn for the establishments in which they passed certain grants of money, to be handed over to the schools, and applied according to the wisdom of those who had instituted the schools. It should be given without grudge, without stint, and without control, because those who had the courage and generosity to establish the schools could surely be trusted with this small portion of their own money, as it were, back again. That would encourage local effort to a very great extent; and, as it seems to me, encourage effort on the part of the students, who would desire to bring back to the schools some portion of the money expended upon them. And those who had the administration of the funds of the Society would feel that not one single penny given was being misapplied, inasmuch as it would all have been fairly earned. Again, it would serve to enlist the sympathy of the whole trade in the well-doing of the Society. Every one would feel he was repaying a positive money reward from his association with the institution. I have just said this in order to elicit the views of those now assembled.

Mr. Vizer (London): I have listened with great pleasure to the observations made by our friends this morning. They have thoroughly ventilated the subject of Provincial Education, and I am sincerely glad to see that there seems to be so general a feeling in favour of the Society's extending its efforts in that direction. With regard to the Report, I will ask permission to make a remark or two on the second paragraph, which contains two very important points. The first is—a fact stated—that "the entrance fees of chemists and druggists who were in business previous to the passing of the Pharmacy Act, 1868, will ultimately cease." The other is,—a hope expressed—"that a large proportion of the rising generation will secure for themselves the highest position and title, that of Pharmaceutical Chemist, a title becoming every day better understood and more highly appreciated by the public; and, having achieved that object of ambition, will naturally desire to become members of the Society." These are two very important points; and as one who sincerely desires the welfare of this Society, I venture to make one or two observations upon them. Facts are stubborn things, and we have here the fact plainly stated, that the entrance fees of chemists and druggists must ultimately cease. Now the question suggests itself, what are we gaining by those fees? During the year we have received £222 for entrance fees of this kind, representing 106 outsiders who have sought membership. Now, I must confess, and I have said the same before, that I do think it would be for the benefit of this Society if we could by any means get rid of that entrance fee. We have got £222 in cash, and with it £106 per annum; the question is, whether, if that two-guinea fee were abolished, many persons who now remain outside the Society would not come in. I am aware that theory says why should we admit these persons who have never done anything for the benefit of the Society without making them pay something for the privilege? Now theory is very good, but it often has to give way to practical experience, and I think this is a case in point. If we could only get rid of this two-guinea entrance fee, it is my firm opinion, many would be inclined to join our Society; and instead of having £222 to invest at three per cent., you would get some hundreds of pounds per annum in the form of subscriptions, from those who would be willing to join the Society, if not asked to pay an entrance fee. Therefore, for the sake of receiving £222 cash, according to my way of thinking, we shut out a considerable annual income. The next point is—the hope expressed—"that many members will join the Society;" this brings us to a most important question. I do not believe there is a more important one in connection with our Society. During the past year we have had fifty pharmaceutical chemists who have passed their examination; and out of this fifty I understand from Mr. Bremridge that twenty-five have joined the Society. Of chemists and druggists there have been 234 who have passed the Minor examination, and 123 the Modified, making a total of 357, whilst only fifty of these have aspired to the higher title of Pharmaceutical Chemists; and out of those fifty, only twenty-five have joined the Society. Now we cannot forget that our Society to a large extent is governed by its members; the Council itself must consist of two-thirds of pharmaceutical chemists; and if, during the year, we only increase our number by twenty-five, and at the same time a large number, by old age and in other ways, is removed from us, it follows that in course of time we shall absolutely be in danger of not having sufficient men to undertake the responsible duties of the Society. The question I should like to lay before you is this—In what way can we render the higher character of membership of the Society something to be desired and aimed at by these men? We must bear in mind that at the present time a man may come up and pass the Minor examination, receive a certificate of qualification, and then go forth into the world with the stamp of competency. Previous to the Act of 1868, the Minor examination was but the stepping-stone to the higher one, which conferred the degree of pharmaceutical chemist; and it was the general expectation of those who were officially connected with the Society at that time, that those who passed the Minor examination, would go on to the Major, and thus qualify themselves to become members. But now things are altered. Those who now join the Society, not being in business before 1868, are not called upon necessarily to pass the Major examination, but by simply passing the Minor, they are registered as Chemists and Druggists, and there is not the slightest necessity, unless they choose, for them to aim higher and take the title of Pharmaceutical Chemists. But unless they do so, they cannot become members of the Society, pharmaceutical chemists alone being eligible, and that is the important point. In what way, then, can we render that higher title more valuable and appreciated? My suggestion would be this. The Minor examination is a *sine quâ non*, without which no one can go into business; but the Major is an honorary title; and those alone who have extra abilities or ambition will push forward to it. Still, with the Minor certificate, a man stands in the eyes of the Government and the public as properly qualified to carry on business. I do not want to cast reflection, but I must say that some of those who only pass the Minor examination are not so fully qualified to take the responsible position of managers or masters of a business as they should be; and I think if some alteration were made with regard to the fees and to the substance of these examinations, a material improvement might be brought about. At the present time, the fee for the Preliminary examination is two guineas; for the Minor, three guineas; and five guineas for the Major; added to which again, when a man becomes a member—for that is what we should aim at—he must either pay one guinea per annum or twenty guineas commutation fee. Now, might not some alteration be made by increasing the fees for the Minor, retaining the five guineas for the Major, and abolishing altogether the fee on becoming a member. Two ideas suggest themselves to my mind; either that the fee for the Minor should be eight guineas, making with the two guinea fee for the Preliminary, ten guineas; retaining the fee of five guineas for the Major, which should then entitle the person to be registered as a member of the Society; or that there should be a small additional commutation fee, say, five guineas. Education has always been our bond of membership from the earliest days. We have held out that one idea, let a man be qualified, and then let him come into the Society; and I say, if a man has sufficient *nous* in him to press forward for the higher title, let him have some reward for it, either in the form of the freedom of the Society, or that a small fee only should be paid for life membership. I think also that the Minor examination, seeing it holds so important a position, and infers full qualification for business, should include rather more practical chemistry, analysis, toxicology, and so forth, which are not included at present. I will not say any more at present on this point, and would only add, with regard to the Benevolent Fund that certainly the mode of investment is open to a great deal of criticism, and, I think, might be much improved.

Mr. Giles: There is no doubt we have just had our attention called to a very important matter with regard to the future of the Society. It is one which all those who have paid any attention, and have looked to the future welfare of the Society, have seen dawning for many years. It is unquestionably the fact that we have withdrawn, in the spirit of liberality we have practised, many of the inducements which formerly existed to lead men on to attain the qualification of a pharmaceutical chemist by means of the Major examination. That is a very serious matter. On the other hand, we have had little anxiety about quality of the institution, but every anxiety about numbers. In future, the difficulty will be reversed; we shall have less anxiety about numbers, but more about our quality. With regard to the Juries Bill, I cannot quite enter into the spirit of satisfaction with which this has been regarded, for we are by no means out of the wood; we have simply got into the condition in which our difficulties may begin. As I understand, this Bill has passed the second reading, which is a sort of guarantee that the Bill in some shape or form will be carried; but we have only just arrived at that condition when its clauses will be examined on every matter of detail as a perfectly open question. Now, Sir, the clause that applies to us in page 4, by which apothecaries, certificated or registered medical practitioners and chemists and druggists, if actually practising shall be exempted, is all very well supposing that it passed; and I should be very pleased that all the members of our trade should participate in the advantage which at the present time is secured to pharmaceutical chemists only. But supposing that clause should not pass,—supposing there should be an objection to eliminate from the jury lists so large a body (and I will venture to say without any affectation of modesty, such a qualified body), what is the consequence? I find that one of the Acts repealed in this Bill is the Juries Act, which gives pharmaceutical chemists their exemption. Now that is a very important thing, and I think that while it would be very satisfactory that those who are practically engaged in the same trade should have the same advantages, yet I cannot help seeing, with considerable anxiety, the possibility of my losing that advantage which I have without their gaining it. Therefore, the best attention of our Council is still required to watch the progress of that Bill. We want it on all matters affecting the good of the Society. These meetings are very important, and the expression of opinion at them tends to strengthen the Council's hands; but in all matters of administration we must rely on the action of the Council itself, which is a more concentrated body. Very frequently questions arise which take their origin outside the Council, and, as an instance, I may take the question of provincial education. It has advanced a certain stage by external action very properly and advantageously; but at the same time—and I am now going to act the part of the judicious friend, in other words, as a wet blanket, in giving a word of caution on this matter—let us be careful not to go too far. It seems to be assumed by many speakers that this Society is an educating body. It is not; it never set itself up as such. It was established as a central organization of chemists and druggists, to promote education certainly, but never, as I understand, to provide it. The providing of education became to some extent associated with it from the circumstances of the time. It is surprising how little men govern the world, and how much it is governed by circumstances and the course of events. In the same way we have been led on to provide pharmaceutical education when we found that a large amount of qualification is demanded by the examiners; that there is no means of providing it, and that now some means must be taken to provide it. At the same time that is not the main duty of the Society or part of its constitution, though I admit it is our duty, both in our corporate and individual capacity, to aid in every way we can to promote it. At the same time do not let gentlemen run away with the idea that this Society fails to fulfil the purposes for which it was called into being if it does not provide means of education all through the country, which it is highly necessary should be provided. Do not let it be supposed that I am endeavouring to check the action which is being promoted in this direction. I perfectly agree with what has been said as to our adopting the principle of the Government schools, and acting in conjunction with them. These schools, as I have said before, are, I believe, destined to perform a most important service throughout the nation in an educational point of view, in furnishing a means which never had been provided before; and let us all in our respective neighbourhoods do what we can to promote these schools. I am a subscriber to them, and, but for other engagements, I should have been on the Board of Management of the one in Bristol. In point of fact the Government of the day desire, I believe, to encourage art and science education. We cannot fail to see that there is a strong desire on the part of the Government to foster, encourage and extend these schools, and I say that they are not only destined to provide a general scientific education throughout the country for persons who want it as a basis for their engagements in manufactures and in art, but they are also intended to subserve the necessities of pharmaceutical education. I also believe that the medical profession will give up their schools to the extent of their ordinary science teaching, and rely upon these Government schools for education in chemistry, botany, and so forth. I consider it is our duty to ally ourselves with these schools as much as we can, and to look forward ultimately to them as being the means of providing that general provincial education which is necessary for carrying out the necessities of the Pharmacy Bill by the education of our members throughout the country. At the same time I am not a great advocate for watching and waiting. I would not wait in entire indolence. I do not believe in the masterly activity which allows questions to solve themselves. I believe there is a real power in patience; but, at the same time, we cannot allow things to go on without endeavouring to do what we can. Therefore, I consider in the meantime it is the duty of this Society, until some more efficient means are called into being, to do all it can to promote the cause of pharmaceutical education, whether it be in London or in the provinces. I approve of this Report very greatly, and I particularly admire the caution with which that statement in the middle clause of the eighth page is worded,—it says, "It is eminently a question of considerable difficulty, requiring much careful thought, for whilst the desirability of carrying out such a project is generally admitted, it is obvious that it should be done equitably, and to be done equitably, it must be done systematically." We could not possibly at this meeting pronounce any opinion on anything laid before us as being sufficiently tangible for action; it must go back to the Council, and I hope we shall see this particular point well represented in the incoming Council. My vote has been largely influenced with that object, in order that those who have this cause at heart may also have the responsibility of carrying out their ideas, for I do not believe in anybody standing outside and begging that something should be done unless he will take the responsibility of carrying his views into action; not that I wish to impute anything of that sort. That is all I wish to say upon this point. But I feel obliged to state that I shall not be able to vote for the reception and adoption of the Report. If it were simply a question of reception, I would say nothing, but I cannot adopt that which I believe to be injudicious, and which I also believe to be untrue. I refer to the last clause of the Report, upon which I make no further observation than this,—I thought what we wanted at this time especially was conciliation, and why on earth any recollection of things that are passed should be brought forward again I cannot understand! I am sorry that the Council in an injudicious mood has said that which I cannot believe is strictly accurate. In an official document of this kind I think it is of all things desirable that you should be very guarded, and that nothing should be said which is open at all to misconstruction. I cannot admit that Mr. Forster's Bill was withdrawn in consequence of the action of this Society; nor can I admit that the Council had any official knowledge of its being opposed by a very large majority of the trade. I just take the opportunity of saying that if that Bill were brought forward again I should oppose it very strongly for this reason above all others, that it proposed to vest in the hands of the Council that which I say was a legislative faculty that ought to rest solely in the hands of the Society. If the Council were permitted to do that kind of legislative act, I say it would be exceeding its functions. I will not say any more about it, but it is impossible that this motion can be carried unanimously, because however unpopular I may be, I shall follow the rule which I have made, and have often found the value of it, namely, to stand by my opinions and vote accordingly.

Mr. Heald (Sleaford): The question of provincial education has, up to this time not been approached by anybody belonging to a purely provincial town, such as I come from, containing about 4000 inhabitants. I think masters in the country have many of them been harshly treated, and the shortcomings of apprentices have in most cases been attributed to the neglect or incapacity of the master, when, in a great many instances, the master has been not only willing but anxious that the apprentice should receive a scientific education, and the fault has been on his side in not availing himself of the advantages given. As a proof of that I may refer to a letter which I have here from a master in a small town referring to an application about an apprentice. He says the hours of business are from seven to eight in the summer and from eight to eight in the winter, except on Saturday, when they are later; that he allows time in the week when he expects the apprentice to collect plants; that he expects him to pass the Preliminary examination, and connect himself with the Society. I believe that is not at all an isolated example of what country druggists wish to do for their apprentices. There are a great many of us in the country towns who would be very glad to do these things; and many have passed their examinations without attending any lectures or receiving any instruction whatever. I do adhere to the old adage that "God helps those who help themselves," and I certainly should oppose any assistance being given to large centres like Leeds, Bradford, Sheffield, Manchester, and so on, while small country towns like the one I come from are left out in the dark. I believe the Pharmaceutical Society receives more support in proportion to the number of druggists in small towns than in large towns such as those I have named. In the town where I live there are five chemists, three of whom are members of the Society, and out of eight apprentices and assistants, I think there are four or five associated with us, which is a much larger proportion than we have had mentioned in the statistics given with regard to Leeds and other places. One gentleman alluded to Preliminary examinations, but I believe most country druggists are now insisting on lads passing the examination before they sign their indentures. I have adopted that plan myself, and I believe it is becoming general. With regard to the entrance fees, I believe the abolition would be a good thing, for I know two druggists who would have joined immediately after the passing of the Pharmacy Act had it not been for the entrance fee of two guineas. As another reason why more chemists do not join, I am afraid from what I have seen in the the Journal that the Society does not really stick up for the interests of the country trade in the manner it ought to do.

Mr. Carteighe (London) suggested that as all seemed agreed upon the necessity for provincial education, it was not desirable to spend more time in discussing mere matters of details, which must be left to the Council to carry out.

Mr. Sutton (Norwich) said: I quite agree that we need not spend more time on this matter, but I should like to refer for one moment to the statistics of the examinations given in the Report. I find that in the Major examination, the percentage who pass is 71, the Minor 63, Modified 65, and Preliminary 66. I am quite prepared to believe that on the whole, that is a fair proportion; but I certainly think it is a great shame that we have a failure of one third in the Preliminary examinations, and I do hope it will go forth from this meeting as an expression of opinion that masters should be more careful in selecting their pupils or apprentices. I do not mean so much with regard to the premiums they receive, but in seeing that they have been carefully and properly instructed before they attempt to enter the business. If we do so, we shall place the Society in a higher position than it is now in, and I hope it will be borne in mind and acted upon year after year.

Mr. E. Burden (London): The question of education is no doubt, of great importance, but I think what I am about to speak of is of nearly equal importance, and I am sure I shall have the sympathy of all who hear me. It has been thrown out by two or three gentlemen who have spoken this morning, that something might be done to employ the money belonging to the Benevolent Fund to better advantage for the Society. I also remember that last year we had no candidates for pensions beyond those who were previously elected, and therefore the fund is to some extent lying idle, which seems an unfortunate occurrence. A short time ago it was suggested to me that possibly it might be a good thing if, in conjunction with the Benevolent Fund, we could establish a life insurance society, which should be taken up by all the members. We cannot forget that throughout the country we are not, as a rule, a rich body of men, but on the contrary many of us are not so wealthy as other trades, and I think if we could employ the Benevolent Fund in some way as an insurance for our widows and orphans, it would be a great advantage. I find that in 1861 the census showed that there were 16,000 chemists in the United Kingdom, including assistants; and according to the present Report, we numbered at the close of last year, nearly 2500 members. This number is quite large enough to form a life insurance society for the exclusive benefit of chemists and druggists; and if our present offices and staff could to some extent be utilized, it would effect such an immense saving in the working expenses, especially as we have local secretaries throughout the country and should not require advertising, that it would enable the managers of such a society, under the guidance of an actuary, to adopt a scale of payments considerably below those required by ordinary insurance offices; I should say, and I speak after some inquiry, to the extent of 15 or 20 per cent. There are other and important arrangements which could be introduced, and it is here that I wish the application of the Benevolent Fund. We are generally a respectable body, and feel adverse circumstances deeply; and many hesitate, I believe, to come and ask for assistance even when they require it; but such a scheme would enable them to come with a better face, as they would feel they were not entirely asking for charity. For instance, a member unable to keep up his payments, might be assisted from the Benevolent Fund, so as to keep the policy on foot, or if he were unable or unwilling to keep up the premiums, the full value of his former payments might be secured to him payable to his family on his death; money also might be advanced in case of need on deposit of the policy with a bond by himself or other sureties, and annuities, and endowments; provisions for children might also be included. I think that if these advantages were put forward, such a scheme would be sure of success, and that we should meet with a response from nearly all the chemists and druggists in the kingdom. I dare say there are many in the trade who have not insured their lives, and here they would have a body to deal with which would have every consideration for them, which would consider each case; and if adverse circumstances occurred, and the policy could not be kept up, it would be in the hands of the Society, which would give the member its full value. Receiving aid in such a way would not entail the feeling of pauperism on the part of the recipients; and I hope, therefore, the subject will receive mature consideration from all parties. It is a matter which has grown upon me, and I feel its importance so much myself, that I shall be willing to co-operate with any gentlemen in carrying it out.

Mr. Smith (Walworth) said several cases had come to his knowledge during the last year of peculiar hardship, on account of the provision of law which compelled the widow of a pharmaceutical chemist to sell the business directly after his death, and he should very much like to hear if something could not be done by the Council to alter that objectionable clause in the Act. If any member died, his business could not be continued by his widow or daughter, but must be sold. He knew a case within the last six months in which a widow had to sell her business at a loss of over £400.

The President said that a business could be carried on for the benefit of the widow by trustees appointed for the purpose.

The Solicitor read the clause in the Act bearing upon the point, namely: "Upon the decease of any pharmaceutical chemist or chemist or druggist actually in business at the time of his death, it shall be lawful for any executor, administrator, or trustee of the estate of such pharmaceutical chemist or chemist and druggist to continue such business."

Mr. Smith: For how long?

The Solicitor: There is no limit "if, and so long only, as such business shall be *bonâ fide*, conducted by a duly qualified assistant."

Mr. Bannard said the last speaker was not singular in his opinion, for he had known a similar case.

Mr. Urwick said he had the arrangement of an estate, and, on writing to the Secretary, he had been informed that the business could be conducted by a qualified assistant.

The Solicitor further explained that the business could only be carried on by trustees, or executors, or administrators, not by a legatee. If a man died without a will, some one must administer in the estate, and he could carry on the business for the benefit of the widow; but the moment the estate passed to a legatee, then the executorship or trusteeship came to an end.

Mr. Reynolds (Leeds) said: Mr. Mackay had reproduced a statement from the Journal which put three northern towns in rather an invidious position. If he had read that article with a little more care he would have seen that whilst the average percentage of membership throughout the country was twenty, if the statistics given for those three unhappy Yorkshire towns were thrown into percentages, they came out Sheffield, twenty-seven; Leeds, twenty-four; Hull, nineteen; or an average of twenty-three and a third, a little better than the general average of the country. He would also point out that membership in the Society must not be taken as the only test of earnestness in the cause of pharmaceutical education, for the local associations had many more members. In his own town there were over fifty members of the local association who paid their half guinea a year, simply because they were in earnest in promoting education.

Mr. Mackay said he had only quoted the figures to show how natural it was that the Council should desire to have more evidence of support given to the Society, before making grants to any particular town.

The resolution for the adoption of the report was then put, and carried with one dissentient.

Mr. Vizer then said: Mr. Chairman,—I will endeavour to be as brief as possible in my remarks in introducing the resolution of which I have given notice; and I hope those who follow me will be brief also. The resolution is:

"That considering the altered position which this Society now holds under the Pharmacy Act, 1868, towards the trade, it is the opinion of this meeting that no resolution involving legal consequences, as contemplated by the first clause of that Act, should be received at any general meeting of the members unless fourteen days shall have been previously given to members by the Secretary by advertisement or otherwise. This meeting, therefore, respectfully urges upon the Council the importance of framing a Bye-law to that effect."

This resolution, Sir, is I think one of great and general interest to every member of our trade, whether he be inside or outside the pale of this Society. In the first place I would call your attention to the Act of 1852, which you will find really only legalizes the registration of a certain voluntary body. It states in the preamble that "certain persons are desirous of advancing chemistry and pharmacy and promoting an uniform system of education," and so on. I will not trouble you by reading the whole of that Act, but if you go through it clause by clause you will find that almost every one refers to the *registration* of a voluntary body. Now, the Act of 1852 was supplemented by that of 1868, which incorporated and embraced the previous Act, putting our trade in a wholly different position to that which it held before. Up to 1868 it was a matter of choice whether a person in trade chose to become a member of our Society or not; he was a perfectly free agent, and nobody could prevent him opening shop or carrying on business. But the Act of 1868 entirely alters the position of the trade. The very first clause says,—"It shall be unlawful for any person to sell or keep open shop for retailing, dispensing, or compounding poisons (and so on), unless such person shall be a pharmaceutical chemist or a chemist and druggist within the meaning of this Act, and be registered under this Act, and (this is *the* point to which I wish to direct your particular attention) shall conform to such regulations as to the keeping, dispensing, and selling of such poisons as may from time to time be prescribed by the Pharmaceutical Society with the consent of the Privy Council." If I may be allowed, I will for the moment omit all reference to the word "poison." Under this Act every chemist is bound to obey the laws emanating from 17, Bloomsbury Square. The Act in every way applies as much to the most isolated village chemist as to the most renowned of London establishment. No one can say now that he will not obey the laws of this Society, because the Government says he must. I believe it was stated last year by Mr. Giles that this meeting was 'omnipotent;' at any rate I say so to-day. This meeting *is* omnipotent according to the Act of Parliament. I would draw your special attention to the wording here; it does not say such regulations as shall be prescribed by the 'Council,' but by the 'Pharmaceutical Society,' and the 'Society' consists of the general meetings of the members. It is, I believe, the only clause in the Act in which the word "Society" occurs; but acting on that clause we may come to this meeting, and any resolution may be brought forward and passed, and after the consent of the Privy Council has been obtained thereto there is no power to alter it. I would ask your attention for a moment to that fact; in my opinion such unlimited power is highly undesirable to be vested in any meeting, where such large interests are involved. It may be said that this resolution would cripple or hinder our discussions. Not the least in the world. Discussion is one thing; but to put that discussion into the form of a resolution, to be accepted or rejected by a meeting, is another thing. We may discuss any question, but when it comes to a vote of Yes or No, then things are changed, and it is against that alone that my resolution points. We must bear in mind that we meet here as a body of members of the Pharmaceutical Society; but this Society does not embrace the whole trade. There is a large body, numerically far stronger than ourselves, outside the pale of the Pharmaceutical Society, and those gentlemen naturally and justly, I think, regard the action of our Society with a somewhat jealous eye. When they know that they are completely in the hands of our Society, it is but natural that they should like to know previously what subjects may crop up at these meetings; and hence, I think, the desirability of adopting the resolution I have now read. It is simply a matter of honest dealing, so that we may all know what we are about, and that nothing may be brought forward under this clause without due notice. It may be urged again, that circumstances may arise where it would be very important that immediate action should be taken; but I apprehend that this resolution will in no way interfere with any such action. Such action would belong to the Council, and this resolution in no way fetters the hands of the Council, it simply regulates the action of our General Meetings with regard to the particular subject of this clause. Another objection which may be raised is, that we have the power of calling a special general meeting should any objectionable resolution be passed; but I apprehend that if a resolution had passed this meeting, it might obtain the sanction of the Privy Council and become law long before a special meeting could be called. I will now commend the resolution to the attention of the meeting, with the hope that it will be adopted. I would add that I have good grounds for supposing that many of our Council look upon it in a favourable light, and I believe its being adopted will strengthen the hands of the Council and benefit the trade at large.

Mr. Wade said: I second the resolution with great pleasure, because I think it will be for the benefit of the Society, and also the trade. I think the discussion that has taken place this day has all gone in favour of this resolution; and if it had not been that the sentiments uttered all appeared to me to tend to support this resolution, I should have taken an opportunity of making some remarks myself. It is evident that the Society desires to obtain the confidence of the trade at large. It has struck me for years past that there has been a confusion of ideas on this point whether intentional or not. There are two duties this Society has to perform, one in its capacity as being a corporate body, the other as a private society or club; but the two seem to me so wrapt up together, that that which is the duty to the trade at large becomes involved in that which is the privilege of the members of the Society. Nearly all the arguments have been so confused on this point that it appears to me to be almost impossible for the Council of the Society to perceive what is its duty to the trade at large, and what is its duty to the members as a private society; because, taking the Society, what is its position after all? Nothing more than a private privilege which people have on paying subscriptions. If such is the case, and if, as stated in the Journal, there are in Leeds, Hull, and other large towns, such an immense number of tradesmen who are not members of the Society, is it a matter of right or justice that you should on the spur of the moment bring forward any resolution and make it a law of the trade? Apart from that, I appeal to you on behalf of your own members. Your own members have allowed you to come here in confidence to-day, not having thought it necessary to come themselves, because they believe there is nothing likely to be done here that would be detrimental to their interests. There has been nothing sensational expected. They believed there would be simply a discussion on the Report, and a few other matters which would not be to their injury or affect their interests. But if it had occurred to any gentleman that this was a favourable opportunity, being a quiet meeting, when by getting a certain number of gentlemen who agreed with him he could pass a resolution, and if he had chosen to bring forward a resolution at this meeting, no one knows what injury might be done; and it would be impossible to prevent that becoming law. I ask you, therefore, to support this resolution, because I know that you have nothing in your minds but that which is fair and aboveboard, and this will ensure due notice being given beforehand of any important resolution such as I have referred to. You have said from the beginning that the Society has for its object, not simply present good, but also the future welfare of the whole trade; and in carrying out this idea, and recollecting that your private membership is entirely distinct from your action in a corporate capacity, and the powers entrusted to you by the Act of Parliament, I hope you will support this resolution which I have much pleasure in seconding.

The President said the resolution simply asked the Council to pass a bye-law requiring fourteen days notice of any resolution having legal consequences, and, therefore, he saw no difficulty in its being put.

Mr. Carteighe said he quite agreed that it was very desirable to have a fair field and no favour for anything which might be brought forward, but he thought many gentlemen present were not quite clear what it was that was proposed, and he would therefore suggest that the resolution should be withdrawn and the matter left in the hands of the Council. At any rate he should like to ask the solicitor what the legal consequence of the resolution would be.

The President said if Mr. Vizer thought fit to withdraw the resolution, he was authorized to say that Mr. Brown, who had been balloted upon the next Council, would undertake to bring forward the subject at the earliest possible opportunity.

Mr. Giles said if they passed the resolution it would go as a request to the Council to pass a bye law to that effect. He was not quite clear about the matter himself, because it seemed to him they were going to tie their hands, and it was a very good rule in business never to tie up your own hands. He did not see any likelihood of any harm arising if this were simply intended to prevent surprise and things being brought forward at the general meeting which ought not to be without notice, and without being properly debated by all interested.

Mr. Atkins thought the resolution asked the meeting to do what it condemned itself.

Mr. Vizer said that was not the case, because his resolution involved no legal consequences.

Mr. Giles asked if such a bye-law would be operative if passed.

The President said the resolution before the meeting bound them to nothing except that it urged upon the Council the importance of forming a bye-law, that bye-law must come before a special general meeting before it could be confirmed.

Mr. Brown: I cannot see any purpose that can be served by passing the resolution, except as an intimation to the incoming Council of the feeling of this meeting and the feeling—which I believe is expressed by this meeting—of a considerable number outside. If Mr. Vizer, with the assurance that he has already received that this subject shall be brought forward at the very first meeting of the Council, sees fit to withdraw the resolution, I believe his purpose will have been answered, and time may be saved. The resolution itself cannot have any legal effect, as it is not competent for this meeting to undertake the question of an alteration of a bye-law. Proper steps must of a necessity be taken by the Council at its very first meeting, to produce an alteration in the bye-law as wished by the mover and seconder and evidently by a large majority of this meeting. That alteration will have to be considered at two subsequent meetings of the Council, and a special meeting of the Council will then have to be summoned to approve of the amended bye-law, and lastly it will have to be submitted to the Privy Council. I believe the alteration suggested by Mr. Vizer is a very proper and just one, for I do not think matters affecting our legal position should be brought forward at annual meetings without previous notice, and after having passed in a very thin and inattentive meeting should then be submitted to the Privy Council, and have full force of law binding on the whole trade. That is a state of things not to be desired in any point of view; and I do not think there is a member of the Council who would object to any proper and legitimate alteration that could be effected in conjunction with our legal adviser, to prevent such a thing. With that object I pledge myself that this shall have attention at the very earliest meeting of the Council, and if that will satisfy Mr. Vizer, and he will withdraw his resolution, I am perfectly sure that the feeling which has been expressed will have its influence upon the Council.

Mr. Vizer: I feel, after the assurances given by yourself and by Mr. Brown, which are amply sufficient to answer my purpose, I cannot do better than leave it in your hands, and therefore I beg leave to withdraw the resolution.

Mr. Wheeler (London) then drew attention to a pamphlet issued by the Associated Traders' Company, carrying on business at Bishopsgate Street Without, and also at Wigmore Street, containing announcements that prescriptions left before eleven in the morning would be ready by four in the afternoon, but those left after eleven, would not be ready until after eleven the next morning. He wished to know if this could be done legally, and if prescriptions could be dispensed at an establishment in no way connected with the Pharmaceutical Society. He had raised the question as distinctly as possible, and would not occupy more time about it, but should be prepared, if necessary, to submit a resolution. He would rather hear a little discussion upon it at first, if gentlemen were so disposed.

The President said this appeared to be a question affecting the co-operative store movement, and he did not think it came within the business of the day.

A Member thought there would be no harm in the solicitor answering the question whether it could be legally done.

Mr. Wheeler said he would submit a resolution in order to raise the question fairly, viz.: "That this meeting is of opinion that the dispensing of prescriptions by any association of traders not on the Register of the Pharmaceutical Society is illegal, and requests the Council, through their proper officer, to take such immediate proceedings as shall decide the question, in a court of justice.

Mr. Giles said he should be very glad indeed to second the resolution, but he thought the first step should be to ascertain from their legal adviser whether it was illegal. This was a subject of immense interest to all persons engaged in the trade, and if they were at all jealous of their privileges in any direction, it should be against these abominable institutions which were growing up amongst them, and which he ventured to say, were likely to produce not only very great social, but political mischief.

Mr. Mackay said the words which had been read by Mr. Wheeler appeared to show that the prescriptions were sent out to be made up by a properly qualified person. Before the Solicitor answered the question, it would be important to know whether they were made up on the premises.

A Member said he apprehended the Act did not allow it to be done even in that way.

Another Member said it was a common thing in the Haymarket. He had seen one of his own customers coming out of the co-operative stores with a bottle of medicine in his hand.

The Solicitor: Gentlemen, I fancy that your proceedings at this meeting are to a certain extent public property, and it may not be expedient for you to have explicit answers given to all questions you choose to ask. I can point out to you the clause in the Act of Parliament which says that it shall be unlawful for any person to sell, or keep open shop for the retailing, dispensing or compounding poisons.

A Member: Is that all?

The Solicitor: I know of no Act of Parliament in restraint of trade which goes further.

Mr. Wheeler: Most prescriptions do contain poison.

The President: The Council have given great attention to this subject. If you really want your solicitor's opinion, you should ask him whether if a prescription proved to contain poison and to be dispensed by one of these associations can be legally attacked, and whether it would be wise to do so, supposing it to be dispensed by a competent person of your own body.

Mr. Urwick: I would remind you, gentlemen, that this question ought to receive very careful handling. If you should find you could not sustain your proceedings, you would simply be acting as an advertisement to the store, so that I think the matter requires a great deal of caution. No one feels more than I do the evil of these stores, and if this system could be stopped I should only be too glad to do so, but at the same time we should be careful not to advertise them.

Mr. Wheeler: In the meantime the evil exists, and unless something is done to put it down it will increase. The question is, can that something be done legally?

Mr. Malden remarked that he did not think it proper for the Pharmaceutical Journal to be the medium of an advertisement to the effect which appeared in its columns not long ago, that the Co-operative Society in Oxford Street required a manager to conduct the chemist department. He thought such advertisements should appear in other journals.

Mr. Pickering asked if the Act applied to persons keeping a shop and employing a qualified person to make up medicines.

The Solicitor: I should advise without hesitation, that I, as an unqualified person, could not keep open shop for the sale of poisons, and cover myself by employing a qualified assistant; and I should also advise that what would apply to a single individual would apply to many.

Mr. Giles said it appeared to him it was a question of principle, and they wanted some assurance from the Council that it would not be allowed to drop. He should like the question to be thoroughly investigated with legal assistance. He understood that no one could keep open shop to dispense poisons unless he were himself qualified. He did not know whether the clause relating to executors affected it.

The Solicitor: So long as an executor, administrator, or trustee, carries on business as such, he is within the distinct protection of the Act of Parliament. But when he becomes a beneficiary in his own right, his character is changed, and he comes under the penal clauses of the Act.

Mr. Giles: I understand that if a man offends against the law he is amenable to the law.

The President: I think you may safely leave this in the hands of the Council to take such proceedings as they may be advised.

The Scrutineers having been appointed,

Mr. Jameson moved, and Mr. Vizer seconded, a cordial vote of thanks to the President and to the Council, which was unanimously adopted, and the meeting was adjourned until Friday morning at eleven o'clock.

NORTH BRITISH BRANCH.

Dr. STATEMENT OF ACCOUNT FROM JANUARY 1ST TO DECEMBER 31ST, 1871. **Cr.**

	£.	s.	d.		£.	s.	d.
To balance due to Honorary Secretary (Mr. Mackay) for 1870	55	6	6	By Amount lodged in Clydesdale Bank	155	6	6
To Postage Stamps	8	0	1	,, Interest allowed by Bank	0	8	0
,, Printing and Advertising	6	19	0				
,, Evening Meetings	3	9	0				
,, Addition to Museum and removal to Princes Street	9	16	7				
,, Rent of Hall, Room, etc.	20	0	0				
,, Do. Princes Street	9	0	0				
,, Additions to Library	3	1	1				
,, Clerk and Curator of Library	10	0	0				
,, Curator of Museum	5	0	0				
,, Annual Meeting	2	16	0				
,, Insurance	0	4	6				
,, Petty Expenses	1	0	0				
,, Balance	21	1	9				
	£155	14	6		£155	14	6

EDINBURGH, *Feb.* 1, 1872.

Having examined the foregoing Statement of Account for 1871 with requisite vouchers, we found the same correctly stated and entered.

We may remark that the balance entered as due to the Secretary of £55 6*s.* 6*d.* really belongs to the Expenditure of 1870, as shown in previous account for that year, while there still remains available at the credit of the North British Branch of the Society £21 1*s.* 9*d.*, thus making the real expenditure in connection with the Society's operations in Edinburgh for 1871 £79 6*s.* 3*d.*

Signed { JAMES GARDNER. WM. AINSLIE. H. C. BAILDON.

ADJOURNED MEETING.

Friday, May 17th, 1872.

MR. A. F. HASELDEN, F.L.S., PRESIDENT, IN THE CHAIR.

The Scrutineers brought up their report as follows:—

SCRUTINEERS' REPORT.

We, the undersigned Scrutineers, appointed at the Thirty-First Annual General Meeting of the Pharmaceutical Society of Great Britain, do hereby certify that we have examined the voting papers committed to us, and report the following:—

Voting-papers received		1677
Disallowed:—		
Informal (rejected by the Scrutineers, having more than 14 names left)	6	
Received by the Secretary, per post after date (May 13th)	43	
,, without name and address on envelope	16	
,, left open (sent by book-post)	3	
not under cover	4	
		72
		1605

Hills	1483	Urwick	818
Schacht	1409	Owen	754
Stoddart	1397		
Bottle	1377	Carr	700
Savage	1358	Churchill	694
Sutton	1268	Savory	683
Betty	1235	Smith	622
Shaw	1218	Burden	514
Frazer	1201	Starkie	457
Hampson	1024	Stacey	386
Radley	968	Wade	363
Baynes	910	Malden	301

EDWIN B. VIZER, *Chairman*.

FREDERICK ANDREWS. MAURICE HOWELL.
WM. BOSTOCK. JOSEPH KETTLE.
EDWARD BERDOE. DAVID MORGAN.
THOMAS BURDEN. ATKINSON PICKERING.
HORACE DAVENPORT. FREDERICK TIBBS.
HENRY A GAMBLE. BENJAMIN M. TIPPETT.
WILLIAM GULLIVER. CHARLES E. TURNER.
JOHN HORNCASTLE.

May 16th, 1872.

The Chairman then declared the Council and Auditors for the ensuing twelve months to consist of the following Members:—

COUNCIL.

ATHERTON, JOHN HENRY, Long Row, Nottingham.
BAYNES, JAMES, 24, Waterworks Street, Hull.
BETTY, SAMUEL CHAPMAN, 6, Park Street, Camden Town, N.W.
BOTTLE, ALEXANDER, 37, Townwall Street, Dover.
BROWN, WILLIAM SCOTT, 113, Market Street, Manchester.
FRAZER, DANIEL, 113, Buchanan Street, Glasgow.
GREENISH, THOMAS, 20, New Street, Dorset Square, N.W.
HAMPSON, ROBERT, 205, St. John Street Road, E.C.
HASELDEN, ADOLPHUS FREDERICK, 18, Conduit Street, W.
HILLS, THOMAS HYDE, 338, Oxford Street, W.
MACKAY, JOHN, 119, George Street, Edinburgh.
OWEN, JOHN, 234, Upper Street, Islington, N.
RADLEY, WILLIAM VALENTINE, 74, Market Place, Sheffield.
SANDFORD, GEORGE WEBB, 47, Piccadilly, W.
SAVAGE, WILLIAM DAWSON, 30, Upper Bedford Street, Brighton.
SCHACHT, GEORGE FREDERICK, 7, Regent's Place, Clifton.
SHAW, JOHN, 24, Great George Place, Liverpool.
STODDART, WILLIAM WALTER, 9, North Street, Bristol.
SUTTON, FRANCIS, Bank Plain, Norwich.
URWICK, WILLIAM WALKER, 60, St. George's Road, Pimlico, S.W.
WILLIAMS, JOHN, 10, New Cavendish Street, W.

AUDITORS.

ANDREWS, FREDERICK, 23, Leinster Terrace, Hyde Park, W.
BARRON, FREDERICK, 2, Bush Lane. E. C.
HODGKINSON, WILLIAM, 127, Aldersgate Street, E.C.
HORNER, EDWARD, 20, Bucklersbury, E.C.
SQUIRE, WILLIAM, 5, Coleman Street, E.C.

The Scrutineers also handed to the President their report of the return for the election of Local Secretaries.

Votes of thanks were given to the Scrutineers and the Chairman, and the Meeting separated.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

THE SO-CALLED COUNTRY SCHOOLS,

Sir,—I am led to believe, in consequence of having made observations these past few years upon the so-called country schools, that to maintain them satisfactorily will be found to be impossible.

All the country schools complain: the general complaints being, 1st, want of students; 2nd, want of teachers; 3rd, want of funds. These may be the causes of the tottering state of many of them; also, as they cannot be remedied, may prove to be the cause of their collapse.

1st. Want of students. It is a great pity that the chief complaint should be this; for without a fresh supply of students each year, any classes or schools can hardly be expected. I say a *fresh* supply, because the experience of teachers is, that very few old students take a second course of instruction in the same subject or subjects. Large towns, like Liverpool and Manchester, are said to have a few hundred assistants and apprentices each; and yet, how few of this great number are impressed with a proper interest in the subjects treated of! We should naturally expect these large towns to have large and flourishing schools; but if a required number of students for the classes in a very large town cannot be obtained, how is it possible for smaller towns to form classes?

But some very large towns have not more than 100 chemists, the number of whose assistants and apprentices perhaps does not amount to 40; for I need hardly say that a great number do not keep any assistants, while the majority of the better-to-do only keep one assistant, or one apprentice; and it is the few who have two assistants or more. Now, supposing a large town with forty assistants and apprentices, I believe it to be impossible to keep classes afloat with this small number. On the classes opening, 30 out of 40 may attend the first course of instruction; the next season, instead of a larger number of students coming up, only about 10 attend; the year afterwards fewer still; and frequently, of these numbers, only one-half remain to the end of the course. 30 to begin with become 15; 10 the next session, before the end of the course, dwindle down to 5. This is the experience of the associations now in existence; and with these facts before us, why should we shout and agitate about more similar schools with such miserably small numbers?

2nd. Want of teachers. Assuming that there is a large number of diligent and earnest students—a number sufficient to keep up the classes year by year—the next point to treat of is the want of teachers.

I believe any one would say that the proper teachers for a school would be the educated pharmacists—the men who know well the philosophy of their trade; these are the men who will best know what the young pharmacist requires, who would teach more of pharmaceutical science than an *étranger* would ever dream of doing. But these men have unfortunately something else to do than teach.

One fault in the country schools (?) is that they have had teachers who are a little better than nobody. What can we expect a clergyman to know of pharmaceutical botany or materia medica? Would it ever occur to him to treat of the different kinds of senna, or of the difference between aconite and horseradish, etc.? Would a schoolmaster who has dabbled in chemistry six months and taken "a certificate" ever think of, or ever be able to detect corrosive sublimate in calomel? And who could best treat of emulsions, plasters, pill-masses, mixtures, etc? I repeat that the educated pharmacists are the proper teachers; the services of others cannot be of much good.

3rd. Want of funds. Admitting further that both students and teachers are obtained, we now come to the very important question, how are the expenses of the school to be met? The small fees which the students of a country school pay will not cover even the teacher's expenses of one course of instruction, and then how about the other courses required? The question of cost—one supporting my idea of impossibility—is very little thought of. Country schools (if any), must be self-supporting. I do not see any alternative. I could easily show that it is very unfair of the Society to grant aid to the country schools. Moreover, no aid whatever should be expected, seeing that a very small proportionate number of chemists and apprentices in the country contribute anything to the "Alma Mater" which is so ignorantly spoken of. Contributing nothing to her, she cannot justly give anything to them in return.

A COUNTRY MAJOR ASSOCIATE.

G. C.—Your previous question was misunderstood, owing to your having misused a technical term. Your present question has reference to what is commonly called *molecular rotation.* In studying the various phenomena by which it is manifested, you will not find the microscope of service, but will require a piece of special apparatus, which you can construct yourself at small expense by utilizing the Nicol prisms of your microscope. Take an ordinary three-armed retort stand; to the lower ring or arm attach either your polarizing prism or, preferably, a bundle of glass plates inclined at the polarizing angle. In the upper ring fix your analysing prism. The fluid to be examined should be placed in a narrow tube about eight inches in height, attached to the middle arm. If your prisms be crossed before inserting your fluid, possessing rotatory power, you will find on introducing it that light is permitted to pass through the analyser, and is coloured. If you employ a solution of sugar, and you observe that the light which passes through the second prism is red, and that on rotating the analyser towards the right, the colour changes to yellow, and thence through green to violet, you may conclude that the rotation is right-handed. If, on the other hand, you have to turn the analyser towards the left hand, you must conclude that the polarization is left-handed. These phenomena, you will observe, are wholly distinct from those accompanying the action of doubly refracting substances upon plane polarized light. It is not easy to explain within these limits the course to be followed in ascertaining the amount of rotation produced by different substances. Monochromatic light must be used. Suppose you are examining a sugar solution with prism crossed, and the index attached to the analyser pointing to zero. When the sugar is introduced you will find it necessary to rotate the analyser, say 23° to the right, in order that the light may be extinguished. This is the amount of rotation for that particular fluid at its density and for that height of column. As the arc varies with increase or decrease of density and height of the fluid, it is needful to reduce it to a unit of height and density. The following formula is that given by Biot:—P = quantity of matter in a unit of solution; d = sp. gr.; l = length of column; a = arc of rotation; m = molecular rotation. Then $m = \frac{a}{l\ p\ d}$.

W. F. C.—(1) The first two cases in reference to which you inquire seem to be of such a nature as to require being "dealt with as they arise." Inasmuch as they assume sales that are somewhat unusual, as to quantity and frequency, it would doubtless be appropriate for the seller to caution his customer as to nature of the articles sold over and above mere literal compliance with the provision of the Act, unless it were within the knowledge of the seller that such precaution would be unnecessary. (2) The sale of poisons, according to the Pharmacy Act, is restricted to registered chemists and druggists.

Astonishment.—We cannot publish a letter founded on hearsay. We recommend you to communicate with the gentleman in question, and ask him whether the statement is true.

The following journals have been received:—The 'British Medical Journal,' May 11; the 'Medical Times and Gazette,' May 11; the 'Lancet,' May 11; the 'Medical Press and Circular, May 14; 'Nature,' May 11; the 'Chemical News,' May 11; 'English Mechanic,' May 10; 'Gardeners' Chronicle,' May 11; the 'Grocer,' May 11; the 'Journal of the Society of Arts,' May 11; 'Grocery News,' May 11.

COMMUNICATIONS, LETTERS, etc., have been received from Mr. Yewdall, Mr. Rimmington, Mr. Wilkinson, Mr. W. S. Bryant, Mr. Schacht, Mr. Brunt, Mr. Druce, Mr. Powell, G. T., G. C., "One who Failed on April 8th," "An Associate," "Amateur," "All Work," etc.

SALE OF JAVA BARK AT AMSTERDAM ON 14TH MARCH, 1872.

BY. DR. J. E. DE VRY.

Although small lots of Java bark had already been brought in public auction in 1870 and 1871, it was not before last March that any important quantity of that bark was offered for sale. The lot consisted of about 5800 kilogrammes, comprising the barks from five different species of Cinchona, viz.:—

1. *Cinchona Calisaya*, 1970 kilogr.
2. *C. Hasskarliana*, Miq. (*C. Calisaya hybrida*, De Vry), 690 kilogr.
3. *C. Pahudiana*, 2900 kilogr.
4. *C. officinalis*, 190 kilogr.
5. *C. succirubra*, 70 kilogr.

With the exception of No. 5 all the barks had a beautiful appearance and were admirably well packed, and I have no doubt that this good external condition contributed greatly to the high prices which these barks have realized; for these prices, as will be seen, are not in relation to the real amount of alkaloids contained in the barks.

The realized prices per kilogramme were the following:—

No. 1.—One lot (500 kilogr.) 3*s*. 8*d*. to 3*s*. 9*d*.
One lot (200 kilogr.) 4*s*. 10*d*. to 5*s*. 6*d*.
One lot (800 kilogr.) 5*s*. 2*d*.
One lot (250 kilogr.) 5*s*. 3*d*. to 5*s*. 4*d*.
One lot (220 kilogr.) 5*s*. 2*d*. to 5*s*. 4*d*.
No. 2.—One lot (250 kilogr.) 5*s*. 1*d*.
One lot (65 kilogr.) 5*s*. 2*d*.
One lot (75 kilogr.) 6*s*. 4*d*.
One lot (300 kilogr.) 6*s*. 4*d*. to 6*s*. 5*d*.
No. 3.—One lot (900 kilogr.) 3*s*. 5*d*. to 4*s*.
One lot (200 kilogr.) 5*s*. 2*d*. to 5*s*. 3*d*.
One lot (300 kilogr.) 5*s*. 3*d*. to 5*s*. 4*d*.
One lot (1500 kilogr.) 4*s*. 11*d*. to 5*s*. 4*d*.
No. 4.—One lot (60 kilogr.) 8*s*. 4*d*.
One lot (60 kilogr.) 8*s*. 8*d*.
One lot (70 kilogr.) 8*s*. 9*d*.
No 5.—One lot (70 kilogr.) 1*s*. 8*d*.

The chemical investigation of the mentioned barks gave the following results.

No. 1.—(Lot sold at 5*s*. 3*d*., to 5*s*. 4*d*.)
Total amount of alkaloids 1·5 per cent.
Molecular rotation of the mixed alkaloids [*a*] j = 85°·8 ↶.
Quinine: traces.
Ditto (lot sold at 5*s*. 2*d*.)
Total amount of alkaloids 2·1 per cent.
Molecular rotation of the mixed alkaloids [*a*] j = 58° ↶.
Quinine: appreciable traces.
No. 2.—(Lot sold at 6*s*. 4*d*. to 6*s*. 5*d*.)
Total amount of alkaloids 1·8 per cent.
Molecular rotation of the mixed alkaloids [*a*] j = 17°·5 ↶.
Quinine: 0·4 per cent.
No. 3.—(Lot sold at 4*s*. 11*d*. to 5*s*. 4*d*.)
Total amount of alkaloids 0·74 per cent.
Molecular rotation of the mixed alkaloids 90° ↶.
Quinine: traces
Cinchonidine dominates.
No. 4.—(The lot sold at 8*s*. 8*d*.)
Total amount of alkaloids 2·7 per cent.
Molecular rotation of the mixed alkaloids 109° ↶
Quinine: 1·07 per. cent.
No. 5.—
Total amount of alkaloids 1·86 per cent.
Molecular rotation of the mixed alkaloids 39° ↶.
Quinine: 0·3 per. cent.

I am sorry to state that these results seem to me very unsatisfactory, as they are much inferior to those obtained by me with the different barks from the plantations in British India.

The Hague, May 1, 1872.

Note on the above, communicated by
J. E. HOWARD, Esq.

Dr. de Vry having obligingly put at my disposal the specimens of the barks above described, with the option of either adding them to my collection or sending them to the Museum of the Pharmaceutical Society, I have preferred the latter course, and forward them accordingly. It will be seen that the results of the sale tend to confirm the views I have frequently expressed as to the Java barks. The (so-called) *Calisaya* has not the appearance any more than the qualities of the genuine bark,* and the *C. Pahudiana*, though a poor bark, equals it in value. I have sought to discriminate in a practical sense between the different and sometimes nearly allied forms of the Cinchonæ, and to this end have always regarded the differences of the barks as giving most material help in the classification; and, moreover, bringing pharmaceutical designations more into harmony with those of the botanists. In so doing I have experienced the usual lot of those who force unpalatable truths on unwilling ears, and have now the somewhat barren consolation of thinking that the advice given was the best I could offer, and that the present state of the produce of the Dutch plantations confirms my predictions. I am however pleased that my *C. Pahudiana* holds up its head as a distinct species, *distinct* in various particulars, and I think specially in the bark, from the *C. Carabayensis*, with which I pointed out its alliance in my first description. If the *C. Carabayensis* could produce any bark like the above it would doubtless, from its abundance, have become an article of import from South America.

* The *C. Calisaya*, var. *rugosa* (Miquel) is not, in my opinion, a *Calisaya* at all; the specimen of it which I have from Hasskarl, differs entirely from specimens of the true *C. Calisaya* in the same collection.

VESICATING INSECTS.

BY M. C. COOKE, M.A.

(*Continued from page* 863.)

"In Europe, Assmuss states that on being brought into the nest by the bee, the larvæ of the oil beetle leave the bee and devour the eggs in the bee-cells, and then attack the bee-bread. When full-fed and ready to pass through their transformations to attain the bee state, instead of at once assuming the pupa and imago state, they pass through a *hyper-metamorphosis*, as Fabre, a French naturalist, calls it. In other words, the changes in form which are preparatory to assuming the pupa and imago states are here more marked and almost coequal with the larva and pupa states, so that the *Meloe*, instead of passing through three states (the egg, larva and pupa), in reality passes through these and two others in addition, which are intermediate. The whole subject of the metamorphosis of this beetle needs revision, but Fabre states that the larva, soon after entering the nest of its host, changes its skin and assumes a second larva form (fig. 24), which somewhat resembles the larva of the Goldsmith beetle. Newport, who with Siebold, has carefully described the metamorphoses of *Meloe*, does not mention this stage in its development, which he calls 'pseudo-chrysalis.' It is motionless; the head is mask-like, without movable appendages, and the feet are represented by six tubercles. This is more properly speaking the semi-pupa, and the mature pupa grows beneath its mask-like form, which is finally moulted. This form, however, according to Fabre, changes its skin and turns into a third larva-form (fig. 25). After some time it assumes its true pupa form (fig. 26), and finally moults this skin to appear as a beetle (fig. 22)."

"There are other vesicatory beetles belonging to the genus *Meloe*, so named, it is supposed, because they are of a black or deep blue-black colour. They are called oil-beetles in England, on account of the yellowish liquid which oozes from their joints in large drops when they are handled. Their head is large, heart-shaped and bent down, as in the other blistering-beetles. Their thorax is narrowed behind, and very small in proportion to the rest of the body. The latter is egg-shaped, pointed behind, and so enormously large that it drags on the ground when the beetle attempts to walk. The wings are wanting, and of course these insects are unable to fly, although they have a pair of very short oval wing-covers, which overlap on their inner edges, and do not cover more than one-third of the abdomen. These beetles eat the leaves of various kinds of buttercups.

From the remarks of Dr. Hermann Burmeister it would appear that four species of *Meloe* are found, and more or less employed in the Argentine Provinces,* *i.e.* :—

Red-spotted Oil-beetle, *Meloe miniaceo-maculatus*, D'Orb.; dull black; elytra with rounded minium-red spots, two at the base, and a third nearly apical, about three-quarters of an inch long. Found on Malvaceous plants.

This species is figured in D'Orbigny's voyage to South America ('Insecta,' t. 15. f. 6). It is easily recognized by the red spots on its small elytra, and occurs in the interior of the province of Buenos Ayres.

Klug's Oil-beetle, *Meloe Klugii*, Erichs.; black; elytra with three yellow spots; abdomen of a sanguineous brick-red.

This species is described and figured—by Brandt and Erichson—in the Transactions of Acad. Cæs. Leop. Cur. vol. xvi. pl. i. p. 103. t. 8. It is found in Banda Oriental.

Two others were found and first described by Burmeister,—*Meloe sanguinolentus*, Burm., in Mendoza; *Meloe ebeninus*, Burm., in Catamacca.

All these species are enumerated in the 'Revista Farmacéutica,' of Buenos Ayres, for January, 1865.

This completes the list of Coleopterous insects, which have, or have had, any reputation in medicine. It only remains briefly to enumerate the vesicants found amongst other insects, and the adulterants which have been found mixed with the officinal Cantharides.

XI. Miscellaneous.

In addition to the vesicants furnished by the Order *coleoptera*, there are some few others which deserve notice, derived from other Orders of insects. Amongst these we include the one spider which has acquired a reputation for this property.

Blistering Spider, *Clubiona medicinalis*, Walck.; abdomen oval, increasing slightly towards the posterior extremity, which is very much rounded, of a bluish-black, with a pale longitudinal mark near the corselet, and five stripes of the same colour, the last forming a triangle, which is brighter; feet, with brown spots.—Walck. Aptères, vol. i. p. 607. *Tegenaria medicinalis*, Hentz, Journ. Acad. Sc. Phil. ii. p. i. page 53. pl. 5. fig. 1 *a*.

Moquin-Tandon says, "According to Hentz there is in the United States a species of spider (*Tegenaria medicinalis*, Walck.) which the inhabitants use as a blistering agent. This species is common in the neighbourhood of Philadelphia. Similar properties are attributed to *Clubio medicinalis*." These seem to be the same, as far as we can trace, and the *Tegenaria medicinalis* of Hentz would be synonymic with the *Clubiona medicinalis* of Walckenaer.

Chinese Red Lady-bug, *Huechys sanguinea*, Amy.

Dr. Porter Smith has drawn attention to this insect in his recently published Materia Medica of China, and afterwards in a note published in this Journal (p. 4), from the *Medical Times*. It is the chu-ki, or ailanthus bug, called the "Red Lady-bug" in the book above alluded to. It belongs to the *Homoptera*, and frequents the *Ailanthus*, and other trees. The head, thorax, and legs are black; the prothorax is red; the eyes are very prominent; a large, bright red spot on each side of the thorax above; the front pair of wings are dark brown, appearing nearly black when closed on the back of the insect; the hind pair of wings are pale, with brown veins; and the belly is of a bright vermilion-red.

Dr. Smith states that they are capable of raising a blister, but are much less powerful than the *Mylabris*, with which they are combined in the treatment of hydrophobia. The legs and wings are removed, and the bodies only are used for medicinal purposes.

For other particulars we may refer the reader back to page 4 of the present volume.

Andol-andol.—This vesicant has already been alluded to (p. 424). It is obtained from Java, but we have no clue to the order of insects to which it belongs.

Indian Bhir-buti.—In the Punjab is found an insect called "Bhir-buti," which is of a "beautiful scarlet colour, resembling a piece of scarlet velvet. These are collected during the rains, and yield an oil. They have a use similar to cantharides, as a blister and irritant." This is all the information we possess, for which we are indebted to Baden Powell's report on Punjab Products.

Processionary Caterpillars, *Cnethocampa processionea*, and *Cnethocampa pityocarpa*.

The caterpillars of two species of moth are believed to possess powerful irritant properties. The fine hairs with which they are clothed cause great irritation when they come in contact with the human skin, but they probably act merely in a mechanical manner. The ancients employed urticating caterpillars in the formation of sinapisms. Réaumur and Dorthes thought that when pounded, they might, under certain circumstances, be made useful as a

* Pharm. Journ., Ser. 2. Vol. VI. p. 548.

substitute for cantharides. An instance of the effect of these hairs is quoted from a French journal in Christison on Poisons (p. 617), "A child, ten years old, had a common blister applied to the neck and spine as a remedy for deafness, and four days afterwards her mother dressed the abrased skin with the leaves of beet-root, from which she had previously shaken a great number of caterpillars. The child soon complained of insupportable itching and burning in the part, and endeavoured to tear off the dressings. The mother persevered, however, and the child died in two days of gangrene of the whole integuments of the back. The surgeon who saw the child on the last day of her life ascribed the gangrene to the insects mentioned above, and states that they possess the power of exciting erysipelas when applied even to the sound skin." Although not found in Britain, these caterpillars are common on the Continent, where they often become a very great nuisance, on account of their urticating hairs. They abounded in the woods which, before the late war, skirted the city of Paris. In the Bois de Boulogne they considerably damped the ardour of citizens when they were abundant. When the webs were more than usually plentiful, as in 1865, parts of the wood were closed by the authorities against promenaders. In the southern departments of France the danger of coming in contact with "chenille vénéneuse" is so much considered that persons compelled by business to be near a tree infested by them are recommended to envelope their bodies in oiled linen. For further particulars on this subject we may refer to an article on "Processionary Moths," by the Rev. W. W. Spicer, in 'Science Gossip,' No. 77. (1871.)

Chapters for Students.

CHEMICAL NOTES TO THE PHARMACOPŒIA.

BY WILLIAM A. TILDEN, D.SC. LOND.

DEMONSTRATOR OF PRACTICAL CHEMISTRY TO THE PHARMACEUTICAL SOCIETY.

Spiritus Rectificatus.

[§ Alcohol C_2H_6O, with sixteen per cent. of water.] Specif. grav. ·838.

A moderately dilute solution of sugar to which some yeast has been added, kept at a temperature of 70° to 80° F. very speedily effervesces from the escape of carbonic anhydride; and if after the fermentation is over, the liquid is submitted to repeated distillation, the more volatile portion being each time collected, alcohol in an impure state is ultimately obtained. If cane sugar is employed, it is first converted into glucose,

$$C_{12}H_{22}O_{11} + H_2O = 2C_6H_{12}O_6.$$

And this subsequently splits up.

$$C_6H_{12}O_6 = 2CO_2 + 2C_2H_6O.$$

But the reaction is in reality much more complex than such an equation would indicate, glycerine and succinic acid having been detected in the residue of the distillation, and the development of the yeast demands the production of cellulose and fatty matter. Moreover, as ordinarily conducted, the fermentation of saccharine solutions yields small quantities of other alcohols, of which some are homologous with ordinary alcohol, as for instance

Propylic alcohol	C_3H_8O.
Butylic "	$C_4H_{10}O$.
Amylic "	$C_5H_{12}O$.

Others, though possessing the same composition as these bodies, possess different properties; are in fact *isomeric* with them. These liquids are less volatile than ordinary alcohol, and are almost entirely separated by the process of rectification. They constitute the liquid known as 'fousel oil.' The test of the B. P. is intended to indicate that traces only remain.

[§ Four fluid ounces with thirty grain-measures of the volumetric solution of nitrate of silver exposed for twenty-four hours to bright light, and then decanted from the black powder (metallic silver) which has formed, undergoes no further change when again exposed to light with more of the test.]

When alcohol and water are mixed, the liquid becomes warm, an effervescence occurs from the expulsion of the air which the water held in solution; and after the mixture has cooled, it will be found not to measure the sum of the volumes of the two liquids; contraction has taken place. Consequently, the strength of a given sample of dilute alcohol cannot be inferred from its specific gravity, which is greater than the calculated mean. The rectified spirit of the Pharmacopœia is a mixture of alcohol and water containing 84 parts per cent. by weight of the former. It is also often spoken of as being 56° over proof,—this means that in order to reduce it to the strength of proof spirit 100 volumes must be mixed with water till, after contraction, they measure 156 volumes. Nearly 60 volumes of water are necessary for this purpose.

To detect alcohol in aqueous fluids, it is sometimes sufficient simply to saturate with dry carbonate of potassium, when the alcohol separates and floats upon the surface, and may be recognized by its inflammability and other properties. But when the quantity is too minute to be detected in this way, Lieben's test may be used. Add to the liquid a grain or so of iodine and a few drops of caustic soda; warm gently, and then allow it to stand for a time. Iodoform is deposited as a yellowish crystalline substance.

$$C_2H_6O + 4I_2 + 6NaHO = CHI_3 + NaCHO_2 + 5NaI + 5H_2O$$

The iodoform may be recognized when mere traces are produced by examining the deposit under the microscope. The crystals present the appearance of hexagonal plates, or sometimes six-rayed stars. It is said that 1 of alcohol in 2000 of water may be detected by this test.

To obtain *absolute alcohol*, that is alcohol free from water, the Pharmacopœia directs to remove the first greater portion of the water from rectified spirit by means of carbonate of potassium, and afterwards to dehydrate by burnt lime. To deprive it of the last traces of water, the spirit, after the foregoing treatment, should be boiled with quicklime for about an hour in a flask with inverted condenser, and then distilled. The specific gravity of absolute alcohol at 60° F. is ·7939, and boiling-point, under the standard pressure of 760 m.m., is 173·6° F. (78·4° C.).

Alcohol, when acted upon by acids, furnishes by double decomposition a series of ethers which may be regarded as salts of a compound hydrocarbon radicle of which alcohol is itself the hydrate, *e.g.*—

$$C_2H_6O + HCl = C_2H_5Cl + H_2O$$
$$C_2H_6O + HC_2H_3O_2 = C_2H_5\,C_2H_3O_2 + H_2O$$
$$C_2H_6O + H_2SO_4 = C_2H_5\,HSO_4 + H_2O$$
etc. etc.

Ordinary ethylic alcohol is usually taken to be the type of the class of bodies known as "alcohols." They are characterized by giving, by double decomposition with acids, compounds similar to those above enumerated. The members of the group of primary alcohols to which common alcohol belongs furnish, when oxidized, aldehyds and acids, containing in each molecule the same number of atoms of carbon as themselves. Thus ordinary alcohol gives acetic aldehyd and acid.

$$2C_2H_5HO + O_2 = \underset{\text{Aldehyd.}}{2C_2H_3OH} + 2H_2O$$
$$C_2H_5HO + O_2 = \underset{\text{Acetic acid.}}{C_2H_3OHO} + H_2O$$

Spiritus Tenuior.

Take of

Rectified Spirit, 5 volumes.
Distilled Water, 3 volumes.

Mix.

The product has the specific gravity .920, and contains $49\frac{1}{4}$ parts of alcohol in 100 by weight.

REMARKS ON PLANTS FURNISHING VARIETIES OF IPECACUAN, AND ON THE CULTIVATION OF CEPHAELIS IPECACUANHA (RICH.) IN THE ROYAL BOTANIC GARDEN OF EDINBURGH.

BY PROFESSOR BALFOUR.*

Plants yielding various kinds of Ipecacuan belong to the Natural Orders Cinchonaceæ (Rubiaceæ, section Cinchoneæ), Violaceæ, Polygalaceæ, Asclepiadaceæ, and Euphorbiaceæ.

In the Order Cinchonaceæ, there are the following species:—

1. *Cephaelis Ipecacuanha* (Rich.) which yields the annulated or Lisbon Ipecacuan of commerce.
2. *Psychotria emetica* (Mut.) yielding striated Ipecacuan.
3. *Richardsonia scabra*, St. Hilaire, furnishing white or undulated Ipecacuan.
4. *Borreria ferruginea*, DC.
5. *Borreria Poaya*, DC.
6. *Manettia cordifolia*, Mart.

In the Natural Order Violaceæ, the following species are mentioned as furnishing emetic roots:—

1. *Ionidium Ipecacuanha*, Aug. St. Hil.
2. *I. microphyllum*, H.B.K.
3. *I. Poaya*, Aug. St. Hil.
4. *I. parviflorum*. Vent.
5. *I. brevicaule*, Mart.
6. *I. urticæfolium*, Mart.

In the Natural Order Polygalaceæ we find the following species:—*Polygala Poaya*, Spix. and Mart.

In the Natural Order Asclepiadaceæ we have the following species:—*Tylophora asthmatica*, W. and A.

In the Natural Order Euphorbiaceæ the following species is used:—*Euphorbia Ipecacuanha*, L.

The roots of these plants have been used as emetics in various parts of the world, and they agree to a certain extent in being more or less annulated or striated.

Cephaelis Ipecacuanha of Richard, the true Ipecacuan plant, has been cultivated in the Edinburgh Botanic Garden for at least forty years; but it was not propagated to any extent until the recent demand for it in India. This demand arose from the destruction of the plants by the collectors in Brazil, and the fear expressed that ere long this valuable remedy for dysentery might become scarce and dear. The Secretary of State for India resolved to attempt the propagation of the plant in India. Being asked for a supply of plants from the Edinburgh Botanic Garden, I set about the propagation of it. Mr. M'Nab found that this could be readily done by making cuttings of the annulated root.

Auguste de Saint-Hilaire, in his 'Plantes usuelles des Brasiliens,' alludes to the easy propagation of the plant both by seeds and cuttings, and also refers to the risk of its eradication:—

"Quoique cette dernière espèce ait été détruite dans les environs de Rio de Janeiro, et en général dans ceux des grandes villes, elle est encore fort commune dans beaucoup d'endroits; cependant comme on l'arrache sans prévoyance, qu'on n'attend point pour cela la maturité de ses fruits, et que, d'un autre côté, on détruit tous les jours de vastes portions de bois vierges où elle naissait en abondance, il est incontestable qu'elle ne tardera pas à devenir rare, et il serait important que l'on songeât sérieusement à la cultiver. Des essais tentés par plusiers personnes prouvent qu'elle se reproduit également bien par des semis, et par des boutures. Elle n'exige presque aucun soin, quand on la cultive dans les bois à l'ombre des grands arbres; mais, quand on est obligé de la cultiver dans des lieux découverts, il est nécessaire de lui procurer un ombrage artificiel."

An account of the method pursued in propagating the plant has already appeared in the Proceedings of the Society (vol. x. p. 318). Besides greatly multiplying the plants by this method from the specimens which had been long in cultivation, means were taken for importing living specimens from South America. Dr. Christison has taken a warm interest in the matter; and on our writing to Dr. Gunning, of Palmeiras, Rio Janeiro, a graduate of this University, he readily gave his aid, and sent to Edinburgh, on two occasions, boxes containing specimens, from which we were enabled to procure a large number of living plants by the mode of propagation adopted by Mr. M'Nab.

On examining these new plants, there appeared to be a marked difference between them and the old plants cultivated in the garden. The latter are evidently the form figured by Sir William Hooker, in the 'Botanical Magazine' (Tab. 4063), while the former resemble more the figure given by Martius in his 'Specimen Materiæ Medicæ Brasiliensis' (Tab. 1).

The old garden plant figured by Hooker was sent to him by Mr. Mackoy, of Liége; and this form seems to be still cultivated in Belgium, as the Messrs. Lawson have lately received specimens for their nursery from that country. It is distinguished from that sent by Dr. Gunning, by having leaves of a firmer texture, more elliptical or oval, the apex less pointed, and the edges wavy, with fewer hairs on their surface and at the edges. The stem is more shrubby. The plant flowers readily after a year's cultivation from slips. The style is short.

In the plant recently imported from Rio Janeiro, the leaves are more acute, more delicate in texture, and more hairy on the edges, and not wavy. The stem is not shrubby. It corresponds, apparently, with the figures and descriptions of Richard, Martius, and Auguste St. Hilaire. We require the flower, however, to determine more fully the character of the plant. Judging from the figures given by the above-mentioned botanists, the style in the Ipecacuan plant is so long that the two-lobed stigma reaches to the level of the anthers. We cannot say if this will constitute a character of importance. There may be hermaphrodite and dimorphic forms of the plant. Some may have short styles, and some long styles; and the reason why the flowering plants in the garden have never produced seed may be that long styles are required for complete fertilization.* To this point attention will be directed should the Rio Janeiro plant produce flowers in the garden. The roots

* Read before the Botanical Society of Edinburgh, May 11th, 1871.

* This year (Nov., 1871) several of the old Ipecacuan plants are showing fruit for the first time.

of both plants correspond with the Ipecacuan root of English commerce.

The native tribes of Brazil have long known the efficacy of the Ipecacuan root in the treatment of disease. The native names for it are Poaya de Mato and Cipo. In the Minas-Geraes it is called Ipecacuanha. The Ipecacuan plant appears to have been first noticed by Samuel Purchas in 'His Pilgrimes.' In this work he gives an account of voyages made to South America. He states that his treatise on Brazil (part iv. book vii. p. 1311) was written "by a Portugal friar (a Jesuit), who had lived for thirty years in those parts, from whom (much against his will) the written book was taken by Mr. Francis Cooke, of Dartmouth, on a voyage outward bound for Brazil, anno 1601, who sold the same to Master Hacket for twenty shillings, by whose permission it was translated out of Portugal into English." Mr. C. R. Markham mentions that this treatise was signed Mansel Tristan, Enfermero de Collegio de Baya. In it there is an account of a plant called Igpecaya, or Pigaya, which is said to be profitable for the bloody flux, and is supposed to be Ipecacuan.

In 1648 it was described and figured by Piso and Marcgrav in their treatises on the natural history of Brazil, which were published together, viz., Piso, 'De Medicina Brasiliensi,' p. 101, Marcgrav, 'Historia Rerum Naturalium Brasilæ," p. 17. It was then introduced into Europe. Grenier, a merchant, brought it to Paris as a pharmaceutical remedy, and as such it was used by Jean Adrien Helvetius, a medical man. It was brought under the notice of Louis XIV. Experiments were made at the Hôtel Dieu as to its efficacy in diarrhœa and dysentery. The origin of the name is doubtful. Some say *Ipe* (bark), *caa* (plant), *cua*, (scented), *nha* (striped), that is, bark of a scented and striped plant. Martius, in his 'Specimen Materiæ Medicæ Brasiliensis,' states that the name is corrupted into Picahonha, and by the Brazilians into Poaya. The latter name is applied generally in Brazil to all kinds of Ipecacuan plants. Weddell says that it is a corruption of the Indian words, Ycipo ayaca, which mean a twining (cipo), assuming a basket form (liane à panier, a basket twiner).

From Weddell's account in the 'Annales des Sciences Naturelles, Botanique,' tom. xi. (1849), 3 series, p. 193 *et seq.*, we gather the following particulars:—

Ipecacuan is found in parts of Brazil, bordering on the Atlantic, Para, Maranhao, Pernambuco, Bahia, Spirito-Santo, Minas-Geraes, Rio Janeiro, and San-Paulo. The plant also extends to Bolivia; it was seen by Weddell in Matto Grosso, a large Brazilian province far inland. He found it in shady parts of the province among such plants as *Euterpe oleracea*, *Œnocarpus Bacaba*, *Cocos capitata*, species of *Mauritia*, Tree-ferns, and *Iriartea exorrhiza*.

(*To be continued.*)

THE IDENTITY OF LIGHT AND RADIANT HEAT.

BY PROFESSOR TYNDALL, LL.D., F.R.S.

Whether we regard its achievements in the past, or its promise and tendency in the future, all that we know of physical science—every bent and bias which we receive from its pursuit—tends to confirm the dictum of the poet regarding this universe:—

> "All are but parts of one stupendous whole,
> Whose body Nature is." *

If I halt here, and omit the next clause of the couplet, it is not because physical science has arrived at any conclusion hostile to that clause, at all events in its profoundest signification, but simply because what the poet goes on to affirm lies outside the sphere of science. We, as physical students, have to do with "Nature" only, and our view of nature could not be more happily expressed than by the figure employed by the poet. For our vocation, and the delight and discipline that it confers, do not consist in the registration of unrelated facts and phenomena; but in the searching out and discovery of relationship in a system, whose parts we hold to be as closely and definitely related to each other as are the various organs and functions of the living body itself.

It was this spirit of search, this capacity and desire, developed amid natural agencies, to detect the lines of connection between these agencies, that gave for a time such keen interest to the discussion, whether light and heat were essentially different things, or whether a substantial identity subsisted between them. It is not so very many years since that most excellent experimenter and philosophical inquirer, Melloni, isolated from a solar beam a brilliant light, and finding it incompetent to affect his most sensitive thermoscopic apparatus, concluded that light and heat were essentially distinct. But in drawing this conclusion, Melloni forgot that he was implicitly dealing with an instrument of almost infinitely greater delicacy than his thermoscopic apparatus; he forgot that the human eye, and the consciousness connected with the eye, are capable of being vividly excited by an amount of force which when translated into heat might defy all the thermometers in the world to detect it. Melloni himself subsequently modified his conclusion.

It is not so very long since the late Principal Forbes was eagerly engaged in establishing the important point that radiant heat, like light, is capable of being polarized. Since that time Knoblauch, Foucault, Fizeau, and Seebeck have applied their refined experimental skill to this question of identity; and those excellent investigators De la Provostaye and Desains, pushed the analogy between light and heat so far as to prove that the magnetization of a ray of light, in Faraday's sense of the term, has its parallel in the magnetization of a ray of heat.

It was, however, in their private cabinets that these experimenters obtained their results, which were in most cases so small, as to require attention on the part of a skilled observer to detect them. But science grows, and our experimental means augment as our knowledge expands. Recent discoveries and improvements will, I trust, enable me to make evident to you, to-night, effects which have been hitherto confined to far more limited circles; some of which indeed have only been seen by the observers who first noticed and described them. And if those accidents which often hold sway over lecture-experiments of a delicate character should prove favourable, we may be able to push the subject a hair's breadth beyond the limits which observation has hitherto assigned to it.

Heat is presented to us in two aspects: sometimes associated with ordinary matter, through which it creeps by the process of conduction; sometimes not associated with ordinary matter, but, like light, flying through space with immense velocity. In this latter form it is called *radiant heat*. Radiant heat obviously and palpably comes to us from the Sun, but here it is entangled with light. Let me, in the first place, endeavour to unravel this entanglement.

When white light is refracted, it is unravelled and the spectrum is produced. A spectrum of the electric light was thrown upon a screen; and red, green, and black ribbons about an inch wide were successively moved along it. The red placed in the red light appeared a brilliant red; when moved into the green it became black. In like manner, the green ribbon moved from the green, where it shone vividly green, into the red, became an intense black. The black ribbon was black in every part of the spectrum.

Now the red ribbon is not heated in red, and the

* "All are but parts of one stupendous whole,
Whose body Nature is, and God the soul."
Pope's 'Essay on Man,' Epistle I. line 267.

green is not heated in green; but red is heated in green, and green in red. We have heating only where we have absorption; and the heat generated is the equivalent of the light absorbed. Black absorbs all the rays of light, hence, indeed, its blackness; and if it could speak, it might tell us the warmth of every colour. But warmth exists outside the colours. Beyond the red, where nothing is seen, the force acting on the retina is far greater than when the eye is plunged in the red. The objective here is entirely out of proportion to the subjective.

The existence of this heat was thus proved. All the colours but the red were cut off by a red glass, and with a diaphragm having a circular opening, a well-defined red circle was produced. This was refracted by a prism, still remaining a circle. A thermo-pile with its face towards the lamp was then caused to approach the path of the beam. It would have been seen by its shadow on the screen if the light had been at all invaded; but with a considerable interval between the pile and the light, a large defection of the galvanometer testified to the presence of heat beyond the luminous circle. An opaque solution* was substituted for the red glass. A circle remained, but it was an invisible circle of radiant heat instead of a circle of light, and the needle of the galvanometer did not fall, though the visible image had vanished.

Thus, as regards refraction, we have radiant heat behaving like light. And now for reflection. A horizontal beam of light was reflected upwards by a plane mirror, and when the light was cut off by the introduction of the opaque cell, a powerful beam of reflected heat was proved still to remain. The luminous beam was then *totally reflected* by a prism to a horizontal direction; the light was again cut off, and a powerful deflection of the galvanometer needle was obtained by the residual heat-beam. Thus, in respect to common and total reflection the behaviour of light and heat is the same.

The action of lenses on light and heat was then demonstrated, the invisible heat-rays being brought to a focus as readily as the rays of light.

A beam of light was then made to strike a concave mirror, and at the focus, which was strikingly visible in the dust of the room, the thermo-pile was placed, having its face covered. The light being cut off by the dark cell, and the covering screen drawn away, the needle of the galvanometer at once flew to its stops.

Double refraction by Iceland spar was next described and explained. It was illustrated by passing through the spar a circular beam of light, which, on the screen, gave two images. The places on the screen where these two images fell were marked, and the light was cut off by the iodine cell. On introducing the thermo-pile with its face towards the lamp, when it occupied the position of either light-image, a deflection of the needle was obtained. Of the two images, one is the ordinary, the other the extraordinary. Is the same true of the heat? Placing the pile in the place of the ordinary image, cutting off the light, and turning the spar, the deflection of the needle remained unchanged; but when the spar was turned round, while the pile occupied the place of the extraordinary image, the needle instantly fell. Why? Removing the dark cell and rotating the spar, the extraordinary light-image was seen to rotate round the ordinary one, which remained fixed. The heat-beam did the same and thus quitted the pile. Here then we prove that the heat-beam also has its ordinary and extraordinary image. This, it was believed, was the first time the effect had been obtained with purely invisible heat. Knoblauch had demonstrated the double refraction of heat, using the total beam, luminous and non-luminous of the Sun.

Some of the phenomena of polarization were next touched on. Light is propagated by the undulations of an etherial medium, the direction of vibration being perpendicular to the direction of propagation. A crystal of tourmaline has the property of quenching all vibrations except those which are parallel to the axis of the crystal; hence, a plate of tourmaline cut parallel to the axis will allow all vibrations in that direction to pass through it, but will stop all others. A beam of light which has passed through one plate of tourmaline is therefore unable to pass through another placed transversely to it, whereas, if the axes are parallel the light is but little dimmed by the second plate. The black space due to the superposition of the crossed plates of tourmaline was shown, as also the abolition of the darkness by a thin film of mica introduced between the plates.

A beam with all its vibrations reduced to the same plane is called a beam of *plane polarized light.*

The two beams emergent from double-refracting spar are thus polarized. Nicol got rid of one. He cut a parallelopiped of spar into two by a very oblique section, polished the two surfaces, and united them by Canada balsam. The ordinary or more powerfully refracted ray, at the surface of the balsam is, in consequence of its obliquity, totally reflected, and the extraordinary ray passes on alone. In this way we obtain an intense beam of polarized light.

A beam of light was sent through two large Nicol prisms, and shown to be entirely extinguished when the principal sections of the prisms crossed each other. The introduction of a plate of mica between them caused, as in the case of the crossed tourmalines, the instant reappearance of the light. The opaque cell was then placed in front of the lamp, all visible rays being thus intercepted. The thermo-pile was next placed so as to receive the beam after leaving the second Nicol prism. Causing one of the crossed prisms to rotate, a path was opened for the heat exactly as for the light, the deflection of the needle speedily bearing witness to the fact. The prisms being again crossed, the heat-beam was again quenched; but, as in the case of light, the introduction of a piece of mica restored the heat and caused a large deflection of the galvanometer.

Faraday's great experiment was next performed. A beam of light, polarized by one Nicol's prism, was made to pass through a piece of heavy glass placed between the perforated poles of an electro-magnet, and afterwards through another Nicol, so placed that the beam was extinguished. When the magnet was excited, the plane of polarization was caused to rotate and a luminous image flashed instantly out upon the scene.

The effect of magnetization is greatly augmented by adopting the device of MM. De la Provostaye and Desains, of causing the principal sections of the Nicol's prism to enclose, not a right angle, but an angle of 45°. This was done, the heat falling on the pile being neutralized by the method of compensation. On sending a current round the magnet a considerable deflection of the needle was obtained, the direction of the deflection depending on that of the magnetizing current.

De la Provostaye and Desains thus obtained with luminous solar heat a deflection of two or three degrees. With the iodine filter and the electric lamp a deflection equivalent to 150 of the lower degrees of the galvanometer was obtained from purely non-luminous heat.

ADULTERATION OF CHEMICALS IN THE UNITED STATES.

The following particulars as to adulterations of chemicals met with in commerce in the United States, are taken from the "Report on Adulterations and Sophistications" presented at the last meeting of the American Pharmaceutical Association.*

Acetic Acid.—Frequently weakened with water and

* Iodine in bisulphide of carbon.

* See also *ante*, p. 353.

adulterated with sulphuric acid. Six samples tested with chloride of barium gave a precipitate of sulphate of barium in varying proportions.

Muriatic Acid and *Sulphuric Acid*, sold as chemically pure, have both been found contaminated; the former with arsenious and sulphurous acids, the latter with a large proportion of sulphate of lead.

Tartaric Acid has been met with containing 50 per cent. of sulphate of magnesia. Alum is also said to be used as an adulterant, but the reporter had not seen a specimen.

Alum frequently contains iron, probably arising from carelessness in the manufacture. The presence of free acid has also been noticed, especially in the English article.

Carbonate of Ammonia is sometimes substituted by a compound made from solution of ammonia, glue and bicarbonate of soda, which forms when dry a hard translucent mass, resembling genuine carbonate.

Muriate of Ammonia is sometimes met with of very poor quality; iron is often visible on the surface and becomes still more so when dissolved. The report recommends that the purified granular salt should be the only one sold at the dispensing counter.

Black Sulphuret of Antimony has been met with containing sulphide of lead (galena), quartz (30 to 40 per cent.), clay, etc. A good article, however, is procurable.

Powdered Arsenic is sometimes adulterated with sulphate of lime or sulphate of baryta; the pharmacist is, therefore, recommended to purchase the lump arsenious acid.

Bismuth (metal) generally contains arsenic. An instance is mentioned in the report where 400 lb. of antimony was sold by a broker to a manufacturer for bismuth. Fortunately for the latter, he detected the error before the transaction was completed.

Subnitrate of Bismuth has been reported as adulterated with 28 per cent. of phosphate of lime; but it is believed that the salt made in the United States by the principal manufacturers is free from adulteration.

Citrate of Iron and *Quinine* is seldom found made strictly according to the U.S. formula, which does not produce a sufficiently soluble salt. Some manufacturers, therefore, add citrate of ammonia to make it soluble, and others leave out a considerable portion of the quinine to accomplish the same end. There is also a probability that in some cases cinchonine is substituted for the quinine.

Chloral Hydrate has been met with containing the alcoholate. The tests pointed out are the difference in boiling-point;* sulphuric acid, which leaves pure hydrate colourless, but turns alcoholate brown; and nitric acid, which gives little or no reaction with hydrate, but reacts violently with alcoholate, giving off nitrous oxide gas.

Chloride of Calcium has been noticed at Chicago with a large excess of caustic lime, and it is known to have been sold in crystals without any allowance made.

Chloroform is sometimes met with diluted with alcohol, and sometimes not sufficiently purified, and therefore unfit for inhalation. There is also reason to believe that partially decomposed chloroform has been sold through ignorance on the part of the dispenser. Nitrate of silver is useful in detecting this decomposition, by giving a precipitate of chloride of silver with the liberated chlorine.

Cream of Tartar is grossly adulterated, and the distinctive terms are said to be well known to mean varying proportions of terra alba and cream of tartar.

Epsom Salt has been substituted in the Western market by finely crystallized Glauber's salt. As the prices, however, are now about the same, this is not likely to recur.

Ether is sometimes sold containing a large proportion of alcohol. This may possibly arise from the druggist dispensing photographic concentrated ether, made to contain alcohol in order to dissolve the gun cotton.

Iodoform has been noticed of a light canary colour, a considerable portion being insoluble in ether; probably iodate of lime.

Acetate of Lead has been in the market containing a large percentage of crystallized nitrate of lead; one lot was offered to a maker of preparations for the hair as "damaged," which proved to be damaged sulphate of zinc, in lumps.

Precipitated Carbonate of Lime has been offered containing sufficient iron to give it a light fawn colour: supposed to be ordinary chalk, dressed.

Sulphate of Morphia is frequently open to suspicion. In one case the sample did not contain any morphia: placed on a red-hot plate it did not seem to lose any weight, and it was insoluble in water. A fraud in which sulphate of quinine was put into sulphate of morphia bottles has been lately detected in New York.

Phosphorus, according to Dr. Rademaker, sometimes contains arsenic.

Bromide of Potassium has been observed to contain a considerable quantity of water of hydration.

Iodide of Potassium is often adulterated with the bromide; some made in New York was found to contain carbonates in considerable quantity.

Sulphate of Quinine has many adulterants, among them, sulphate of lime; cinchonine, sold as "sweet quinine" or as "cincho-quinine"; muriate of cinchonine, sold as "light sulphate of quinine" and as "French quinine," salicine, etc.

Rochelle Salt has been offered for sale containing at least 25 per cent. of sulphate of soda.

Santonine was seen last year, in the New York market, contaminated with small particles of mica. This fraud may easily be detected by placing the suspected sample on a hot plate, the santonine will disappear and leave the mica.

Nitrate of Silver, made for the Government, was sold in Chicago, which contained five per cent. of copper. Pieces could be picked out emerald green in colour; it appeared to have been made by simply dissolving coin or other alloy of silver in nitric acid, and crystallizing without any attempt at purification.

Precipitated Sulphur is reported as usually free from sulphate of lime, and the United States pharmacist is congratulated on this superiority to the English article, but a proportion of 50 per cent. of gypsum in flowers of sulphur is reported as having been noticed, and sometimes ground sulphur is sold for the sublimed.

Tartar Emetic has been met with containing 11 per cent. of cream of tartar.—*Proceedings of the American Pharmaceutical Association.*

PRELIMINARY NOTICE OF SOME PRODUCTS FROM NATAL ALOES.

BY WILLIAM A. TILDEN, D.SC. LOND.

Nataloïn.

The aloïn of Socotrine aloes appears to be identical with that obtained from Barbadoes aloes, as they crystallize in the same manner, give the same colour reactions with oxidizing agents, and both furnish chrysammic acid by treatment with nitric acid. Natal aloes is a variety which contains a crystalline body of entirely different properties. This was examined for the first time by Flückiger,* and called by him nataloïn. It is readily distinguished from barbaloïn by its comparatively slight solubility either in water or in alcohol, by its crystalline form, and by furnishing, when acted upon by nitric acid, no chrysammic acid, but, as I have found,†

* Pharm. Journ. 3rd Ser., Vol. I. p. 87.

* Proc. Brit. Pharm. Conf., 1871.

† Pharm. Journ., New Series, Vol. II. 441.

picric in addition to oxalic acid. It contains no water of crystallization. Crystallized from spirit, and dried at 100° C., it gave me the following results:—

1.—0·5066 grm. burnt with a mixture of lead chromate and potassic dichromate gave 1·1070 CO_2 and 0·2775 H_2O.

2.—0·3715 grm. gave 0·8110 CO_2 and 0·1965 H_2O.

The percentages of carbon and hydrogen calculated from these data agree very nearly with the formula $C_{25}H_{28}O_{11}$.

		Theory.	I.	II.
C_{25}	300	59·52	59·59	59·53
H_{28}	28	5·55	6·07	5·86
O_{11}	176	34·92	——	——

They also approximate very closely to the average of the determinations made by Professor Flückiger, though the individual numbers quoted by him diverge very considerably from the mean.

Flückiger's Analyses of Nataloïn.

						Mean.
C	58·99	59·14	61·18	58·38	60·15	59.56
H	6·17	6·24	5·92	5.95	6·24	6·10

Acetyl-nataloïn.

Hitherto, although numerous experiments have been tried, I have found it impossible to obtain a chloro-bromo- or nitro-derivative of nataloïn.

When placed in contact with acetyl-chloride, a reaction commences almost immediately, and is complete after warming for a short time. The varnish-like residue left after chasing off the excess of the chloride and hydrochloric acid was dissolved in a mixture of alcohol and ether. In a short time, well-defined but microscopic crystals, consisting of rhombic plates and octahedra, were deposited. 0·143 grm. gave 0·307 CO_2 and 0·070 H_2O.

The percentages of carbon and hydrogen agree with the formula $C_{37}H_{40}O_{17}$.

		Theory.	Experiment.
C_{37}	444	58·73	58·54
H_{40}	40	5·29	5·38
O_{17}	272		

This formula is that of nataloïn in which 6H have been replaced by $6C_2H_3O$—

$$C_{25}H_{22}(C_2H_3O)_6O_{11}.$$

Action of Caustic Potash.

The products of the oxidization of socotrine aloes by means of caustic potash were studied some years ago by Hlasiwetz.* By melting this variety of aloes with caustic potash and a small quantity of water, dissolving the mass in water, acidifying with sulphuric acid, and agitating the whole with ether, an ethereal solution was obtained, in which two crystalline bodies were discovered. These were the para-oxybenzoic acid, $C_7H_6O_3$, of Fischer and Saytzeff, and α orcin, $C_7H_8O_2$.

Some Natal aloes was fused with potassic hydrate according to this method; the ethereal solution obtained left an aqueous liquid, and by continuing the distillation a small quantity of acetic acid passed over. On allowing the liquid to cool, a crop of well-formed colourless crystals was deposited; these, separated from the mother-liquor, were re-crystallized. They are only slightly soluble in cold water, and the solution possesses a strongly acid reaction. They melt at about 205° (the point was not accurately determined), crystallizing on cooling, and, when more strongly heated, volatilize with partial decomposition. Placed over oil of vitriol, they effloresced.

0·151 grm., dried at 100°, gave 0·3365 CO_2 and 0·065 H_2O. These data give percentages which agree with those required by the formula of para-oxybenzoic acid.

		Theory.	Experiment.
C_7	84	60·86	60·77
H_6	6	4·34	4·63
O_3	48	34·78	—

The mother-liquor from which these crystals were obtained was brown and syrupy; it was diluted, precipitated by acetate of lead, the excess of lead removed by exact precipitation by sulphuric acid, and the filtered liquid evaporated, first by the aid of heat, then *in vacuo*. A coloured syrupy residue was thus obtained, which gradually set into a crystalline mass. It was too small in quantity to attempt to purify further, but its reactions were carefully compared with those of the three known orcins.

For small quantities of β orcin and resorcin with which these experiments were made I am indebted to the kindness of Dr. Stenhouse.

A weak aqueous solution of each was employed.

(1). Orcin and resorcin with ammonia redden very slowly. β orcin and the new compound turn purplish red in a few minutes.

(2). With potash resorcin gives a green colouration; orcin becomes slowly reddish brown; β orcin and the new compound become rapidly purple, afterwards brown.

(3). A slip of deal, wetted with the solution, and then with hydrochloric acid, and dried, becomes, in the case of resorcin, blue; with the others a rich purple colour is produced.

(4). Aqueous chlorinated soda gives, with resorcin and orcin, a violet colouration which almost immediately changes to a dull green. With β orcin and the compound from Natal aloes an intense crimson colouration is developed, which is much more permanent than the violet produced by orcin.

(5). A portion of the syrupy solution, treated with concentrated hydrochloric acid and potassic chlorate, gave, in twelve hours, a crystalline chloro-derivative. There was not sufficient for analysis.

These experiments convince me that the orcin from Natal aloes is not α orcin; it is probably β orcin, or it may be the next higher homologue.

I very much regret that the small quantity of material operated upon did not yield sufficient of the substance to complete its purification. I hope, however, to confirm my opinion by further experiments and an analysis of the body.

The production of β orcin from a new and available source would possess considerable interest, as at present, in consequence of the uncertainty attending its preparation from usnic acid, from which alone it has hitherto been procured, its chemical history has been only imperfectly traced out.—*Chemical News.*

* Ann. d. Chem. u. Pharm., cxxxiv. 287.

NORTHAMPTON CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

A dinner to celebrate the success attending their first half-yearly session was held on May 9th.

Covers were laid for fourteen. Messrs. Branson and Osborne presided at the piano. After the usual loyal and patriotic toasts, the President, Mr. Masters, proposed the toast of the evening, "Success to the Northampton Chemists' Assistants and Apprentices' Association," which was drunk with musical honours. Among the other toasts proposed were "The Pharmaceutical Society, and A. Haselden, Esq.;" "The Pharmaceutical Journal, and Dr. Paul;" "The President, Mr. Masters;" "The Secretary, Mr. Druce;" "Professor Attfield;" "The Chemists of the Town;" "The Absent Members;" "E. Bremridge Esq.;" and "The Class-Takers."

The President said he was very much gratified to find they could display such an unusual amount of musical talent as had been shown that evening.

The Pharmaceutical Journal.

SATURDAY, MAY 25, 1872.

Communications for this Journal, and books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE JURIES BILL.

THE Government Bill on this subject which, as we announced last week, has now been read a second time, is one that, as a whole, seemed to meet with the approval of the House, although it contains some provisions which will doubtless provoke much discussion; such as one fixing the number of jurors in County Court cases at five, and in all other cases seven, except trials for murder, where the number is still to remain twelve as at present. It was, however, referred to a Select Committee, where the details will be considered and virtually settled.

But although so much has been gained, the Bill will require careful watching, since the extension of the exemption is so framed that, as pointed out by Mr. GILES at the Annual Meeting, the privilege at present enjoyed by pharmaceutical chemists is somewhat endangered. As will be seen by the quotation from the Bill given last week, the phrase "registered chemists and druggists" is the only one used in relation to persons on the Register; so that as the Juries Act, 1862, which exempts pharmaceutical chemists, is contained in the schedule of Acts to be repealed, should this phrase be cut out, it would have the effect of taking away the present exemption, unless some special provision were made. There is the more danger of this, because the extension of the exemption to registered chemists and druggists appears to be the only instance of the kind in the Bill, its general tendency being to curtail present privileges in that direction. There is also the other fact referred to by Mr. MACKAY, that since the Bill extends only to England and Wales, the Scotch members of the trade, whether pharmaceutical chemists or registered chemists and druggists, will still be liable to service.

Among the other matters worthy of notice, it is provided that a notice is to be sent by post to every man whose name shall be put for the first time upon the list of jurors, stating the time and place where objections will be heard, and informing him that he will not be excused from service on the ground of any exemption which shall not be claimed on such occasion. It is also provided that should a man be summoned who is by the terms of the Bill exempt from service, he may be discharged from serving upon challenge, or upon his own application, if the Court shall be satisfied of the fact; but no such exemption or want of qualification, if not submitted before such juror is sworn, is to be accepted as ground for impeaching a verdict given by a jury. Men of sixty-five years and upwards of age are to be exempt from service if the exemption be claimed in time, but at seventy years of age they become absolutely exempt.

NEW PHARMACY ACT IN PHILADELPHIA.

AN Act regulating the practice of pharmacy and sale of poisons, and to prevent adulterations in drugs and medicinal preparations in the city of Philadelphia, has recently passed both Houses of the Legislature. Stating in the preamble that the safety of the public is endangered by want of care in the sale of poisons; that the power of physicians to overcome disease depends greatly on their ability to obtain good and unadulterated drugs and skilfully prepared medicines; and that persons entrusted with their preparation and sale should possess a practical knowledge of the business and science of pharmacy in all its relations,—it enacts that no person shall hereafter open or carry on any chemical or drug store in that city, or engage in the business of dispensing medicines, or retail "drugs, chemicals, poisons or medicines," without having a certificate from, and being registered by the Pharmaceutical Examining Board. The Board is to consist of five skilled pharmacists engaged in business, appointed by the mayor, who are to hold office for three years, and to examine such persons as may apply to them for registration. The penalty for an unregistered person carrying on business is one hundred dollars per week; the penalty to be handed over to the guardians of the poor of the city. Persons in business at the time of the passing of the Act, and those holding a certificate from an incorporated college, are exempted from the necessity of examination, but not from registration. No person is to dispense prescriptions—except as an aid under the immediate supervision of the proprietor or a qualified assistant—who has not been apprenticed two years and attended one full course of lectures on chemistry, materia medica and pharmacy, and no proprietor is to leave his store in charge of any but a qualified assistant. There is also a clause enacting a penalty of five hundred dollars and forfeiture for knowingly, wilfully or fraudently falsifying or adulterating any drug or medicinal substance or preparation.

The Act appears to be received with approbation by the pharmacists of Philadelphia, although they would rather the appointment of the Board had been vested in themselves than in the mayor. That official, however, has shown a desire to carry out the Act in a proper spirit by requesting the college to nominate ten gentlemen from whom he might select the first Board; the gentlemen upon whom his choice has fallen being JAMES N. MARKS, C. L. EBERLE, JAMES T. SHINN, EDWARD PARRISH, and ROBERT ENGLAND.

There is no poison schedule to the Act.

HONOURS TO PHARMACISTS.

WE are pleased to be able to record, upon the authority of the *Hampshire Chronicle*, that the LORD CHANCELLOR has recently added to the Commission of the Justice of the Peace for the borough of Romsey, the name of Mr. W. H. SLATER, Pharmaceutical Chemist, of that town, and one of the founders of the Pharmaceutical Society. In France, MM. ROUCHER and COULIER, pharmaciens of the first class, have been nominated officers of the Legion of Honour; MM. MULLET, ROUCHETTE, and MARTY, pharmaciens of the second class, and MM. CATENAC and JOURDAN, holding the rank of pharmacien aide-major, have been nominated chevaliers of the Legion of Honour.

ARSENIC IN SULPHATE OF POTASH.

A CIRCULAR has been issued by M. BUSSY, Director of the Paris School of Pharmacy, stating that he has received information of a serious accident that has resulted through the sending out by a Paris wholesale house of sulphate of potash, containing a certain proportion of arseniate of potash, and recommending that no pharmacien should receive or deliver to the public any product that he may have received as sulphate of potash, unless he has previously ascertained that it is not contaminated with the arseniate. M. BUSSY offers the convenience of the laboratory of the School of Pharmacy for the examination of any specimens that may be thought to be doubtful.

A similar circular has also been addressed by the Minister of Agriculture and Commerce to the Prefects, requesting them to take steps to bring the subject under the notice of the inspectors of pharmacies, and to convey the information to the pharmaciens in their respective departments.

ON Thursday and Friday next, Dr. E. SYMES THOMPSON, Gresham Professor of Medicine, will deliver two lectures in Gresham College, Basinghall Street, the subject on Thursday being, "Prescriptions," and on Friday, "Mineral and Vegetable Tonics." The lectures, which will be illustrated by diagrams and experiments, are free to the public, and will commence on each evening at seven o'clock.

BY a decree dated March 15th, M. ERNEST BAUDRIMONT has been nominated Professor of Pharmacy and Chemistry at the École Supérieure de Pharmacie of Paris.

Provincial Transactions.

NORWICH CHEMISTS' ASSISTANTS' ASSOCIATION.

A General Meeting of the above Association was held at the Rooms, on May 8th; J. D. SMITH, Esq., in the chair.

Before commencing the business of the evening, the CHAIRMAN read a letter from the local secretary, Mr. F. Sutton, expressing his regret at being unable to attend, and wishing every success to the recipients of prizes.

Mr. SMITH then proceeded to say that he felt great pleasure in being invited to attend, and occupy the chair on that occasion; and although it was his first appearance amongst them, it was not from lack of interest in the affairs of the association, but because he felt there were many members of more scientific attainments than himself. This led him to compare the advantages enjoyed by the young men of the present day, in being able to attend such an association as this, with those available during the earlier period of his life; and he would impress upon them that these increased advantages necessitated diligent application on their part, as the public demanded greater skill and more general knowledge in the profession; and he thought in the future they would still further extend their call for thorough proficiency. He then drew attention to the small attendance at classes, and said the absentees were doing themselves an injury, for if they failed to study during the years of their apprenticeship, they would find it very hard indeed to make up for lost time in after life. He wished them to compare themselves with those who had worked hard and whom they had assembled there that night to honour, and exhorted them to ensure a better attendance during the next Session. He held in his hand the reports of the various examiners for the Sessional Prizes, from which he gathered that although they were very well satisfied on the whole, they found the candidates somewhat deficient in the practical part; this he trusted they would endeavour to remedy.

The report of Professor Attfield, who had examine the papers for the Vice-President's Prize, was then read as follows:—

"Sir,—Five out of the six sets of answers to the questions for the Chemistry Prize do credit to teacher and pupils; the sixth candidate seems only recently to have commenced studying the subject.

"Assigning 100 as the full value of the answers, I have been able to place the competitors as follows:—

Mr. G. S. Tooke	78
Mr. H. A. King	63
Mr. H. A. Woolnough	58
Mr. S. R. Corder	55
Mr. J. Neale	53

"Yours faithfully,
"JOHN ATTFIELD."

Mr. SMITH then presented the prizes as follows:—

1st Prize	Mr. S. R. Corder.
2nd do.	Mr. H. A. King.
3rd do.	Mr. J. Neale.
Vice-President's Prize	Mr. G. S. Tooke.

The CHAIRMAN then said he should be happy to stimulate the efforts of the young men, and he thought he could not do better than offer prizes for best attendance at classes, but he should be happy to give them in any other way the Council might think more appropriate.

The President, Mr. A. HILL, thanked Mr. Smith in the name of the Association.

Votes of thanks to Professor Attfield for examination of the chemistry papers, and to Messrs. O. Corder, W. J. G. Butler, A. Hill, P. H. Mason, and F. Ellwood for undertaking the *vivâ voce* examination, were then passed.

Mr. O. CORDER, in returning thanks, said he had been much pleased with the progress made in botany by the respective competitors. He was better able to judge, as a twelvemonth ago he conducted the botany class. But while pleased with the theoretical knowledge shown, he noticed deficiency in describing the living plants he had placed before them. He thought that the neglect of the practical examination of plants was much to be regretted.

Mr. Butler then returned thanks, and also noticed the want of practical knowledge in pharmacy.

In proposing a vote of thanks to the Chairman, Mr. Cubitt wished to remind those present that it was scarcely to be expected that this association could undertake to impart really practical knowledge in chemistry and pharmacy. Both these subjects required a course of work in a laboratory, and he thought they ought to be satisfied with the evident proficiency shown by the candidates in the theoretical part. There was one subject certainly which the association seemed well prepared to teach practically, and that was Materia Medica; for, in looking round the rooms, he saw they were getting together a most excellent collection of specimens.

Mr. Butler seconded the vote.

After the Chairman had returned thanks, the meeting closed.

NORTHAMPTON CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

The Half-yearly Meeting was held on May 8th. The chairman, J. Barry, Esq., J.P., opened the meeting by expressing his pleasure at being able to be present with them that evening, and said how gratified he was at the progress they had made. He pointed out the greater qualifications that were needed at the present time in a pharmacist, and how each should try to make himself master of the different subjects which the Pharmaceutical Society had to examine him in, especially as the tendency was to raise the standard of the examinations. He would suggest that French should not be lost sight of in their curriculum, as it would prove eminently useful to them in many ways. He then called upon the President to give his address.

President's Address.

I think, gentlemen, it will be as well for me to commence by taking a cursory glance at the proceedings that have taken place in connection with our Association since its formation, especially as it is our desire that our employers should be acquainted with all that has occurred, as it is through their kind and liberal aid that we have been able to make the satisfactory progress that we have.

The want of an association was very much felt by the assistants, more particularly by those coming to Northampton from towns where such an association existed, and by those who were anxious to pass their examinations.

Not a year ago the assistants of this town were scarcely upon speaking terms, and now I am happy to say there exists, with but one or two exceptions, an amount of friendly feeling that would render any service that one could afford another a matter of the greatest pleasure to perform. I mention this, gentlemen, to show that undoubtedly our Association has not been without good results apart from its chief object, *i.e.* educational purposes. After it was decided by the preliminary committee that an Association should, if possible, be formed, a meeting was convened, and our friend Mr. Law was asked to attend. He very kindly acceded to the wish, and the remarks that he made and the good advice he gave had a most beneficial effect; and I am sure it will be a long time before his sayings will be forgotten by those who were fortunate enough to hear him. The truth of one remark has often returned to my mind, that was, "When a person starts forward to do any good thing he will sure to find plenty to pull him back." Although we have felt the truth of that in a few instances, it is gratifying to know we have found those who were willing to aid us far outnumber those who would have thrown obstacles in our way, and so damped our ardour.

Our first difficulty was to obtain a suitable room, which was soon overcome by the kind offer of Mr. Jeyes in giving us this one free of expense; the next difficulty of furnishing it with table, chairs, etc., was quickly surmounted by the ready response made to the call upon our employers, and our last urgent want of apparatus and books has been supplied by the £10 grant from the Pharmaceutical Society, which I think we were most fortunate in obtaining, when we consider our Association has not been in existence more than six months, and other associations that have been in existence a much longer period have not been so favoured.

The source of instruction has hitherto been amongst ourselves, as we deemed it advisable to pass through the elementary portion of chemistry and botany before we solicited aid from other sources; but I hope that before long the Pharmaceutical Society will grant sufficient to deserving provincial associations to enable them to obtain the services of a qualified teacher (and I think that the best way they can decide upon to give help); by that means a good sound lecture could be heard once a week during the winter months at least. It cannot be expected that any gentleman who has the ability and is in business can afford the time to give a series of lectures, and very little information is obtained upon either chemistry or botany unless a whole course is gone through. However, if the Pharmaceutical Society will not supply us with funds to pay a teacher, I am happy to say there are two or three gentlemen who have promised us all the aid in their power, so between them I hope we shall be able to have a course of lectures upon one subject, at least that is when we find we must have higher instruction than our own resources can yield. I am very pleased to be able to state that the average attendance at the classes has been far above most associations that have sent their report to the Journal, as you will see in the Secretary's Report. I will just remark here that we are very fortunate in having a good secretary. It is well known that the prosperity of an association very much depends upon the efficient manner in which the secretary's duties are performed, and they are now done as well as could be if we had a paid secretary to do them. Besides being secretary, Mr. Druce is treasurer (not that that is very difficult, our exchequer being rather small), and he has the conducting of the Botany Class as well, which has been carried out most successfully; and in other ways Mr. Druce has been most energetic for the good of the Association.

I have seen in the Report of other Associations that they have games, such as chess, etc., and in one instance I noticed that they met to have a quiet pipe. Such doings I consider to be incompatible with study, and you will be pleased to hear, gentlemen, that neither one nor the other is permitted in this room; in fact, scarcely ten minutes is passed of an evening in any manner that does not in some way bear upon our profession.

Mr. Druce then read the following report:—

"The Committee have great pleasure in laying the half-year's report before the members of the Association, feeling certain that they cannot be otherwise than highly gratified at the position which it occupies, the great success which has hitherto attended its movements, and the estimation in which it is held by the principals in the town.

"The Committee beg to say that 23 members have joined the Association; three have left; so at present there are 20 members on their books, there being only 23 in the town. The average attendance at the classes has been 8. This attendance would, doubtless, at first seem small; but, on second consideration, it will be seen that it would not be possible for all members to get out on the same night, although willing to attend.

"The Committee earnestly hope that this attendance may not only be kept up, but, if possible, increased, as this is, after all, the great test of a society's usefulness and success.

"During the winter session nine classes have been held in Theoretical Chemistry, ten classes in Materia Medica; and the capital collection of official specimens has proved eminently useful in making the class a successful one. In Botany, twelve classes have been conducted, and the structural part explained. In Pharmacy, likewise, good progress has been made, questions having been asked on more than half the preparations in the Pharmacopœia.

"The Committee do not think they could continue with satisfaction the two classes weekly during the summer months, so have determined to have classes on one night only in the week—the classes to be botany and practical chemistry alternately, and one morning in the week to have a botanical ramble from 6 to 8 A.M. The Committee beg to draw notice to the success of the special meetings; nine have been held, and several subjects of importance discussed.

"The first was on October 26th, 1871, for the purpose of forming the Association; E. Law, Esq., J.P., in the Chair.

"November 27th, 1871, the first meeting in the new room lent by Mr. Jeyes; Mr. Bingley in the chair. Several points of great interest were brought forward, and the chairman gave them information which has proved very valuable.

"January 15th, 1872. For discussing the poison clauses of the Pharmacy Act, and the want of knowledge shown by coroners in their interpretation of the Act. It was recommended by the meeting that the Editor of the Pharmaceutical Journal should be asked to express his opinion on the particular case complained of, which request he was kind enough to comply with. The Committee are glad to notice that since that time the Council of the Pharmaceutical Society have ordered that a circular, explanatory of the Act, should be sent to every coroner in the kingdom.

February 14th. Professor Attfield, Ph.D., who had kindly consented to deliver some remarks explanatory of the examinations attended a meeting to which the Principals had been invited, and which proved in every way a complete success. "The Committee express their heartiest thanks to Professor Attfield for the extreme kindness shown on the above, and subsequent occasions.

"March 22nd. Mr. Lance read a paper on 'The Relation of Principals and Apprentices.' Mr. Osborne showed a variety of objects through a binocular microscope.

"April 8th. For the arrangement of the practical chemistry class, which the grant from the Council had enabled them to commence.

"April 25th. A paper by Mr. Masters on 'The Preparation of Tinctures,' and one by Mr. Druce on 'The Early History of Chemistry.'

"In regard to financial matters, the Committee beg to offer their sincerest thanks to the employers for the noble manner in which they responded to the application made to them.

"To the Pharmaceutical Society also they were under great obligations for their grant of ten pounds and for the Journal.

"The Committee also thank those assistants who have conducted the various classes during the winter session in such a satisfactory manner."

E. F. Law, Esq., J.P., after alluding to his not being in any way connected with the business to which the members belonged, in an eloquent address pointed out the advantages to be derived from studying science, the necessity for keeping their eyes open to the commonest affairs of life, for oftentimes great scientific facts were educed from the most common circumstances; and quoted several anecdotes to illustrate the truth of the statement. Referring to what the President had said about some societies having introduced smoking and chess, he strongly advised them not to copy the example, for however good they might be in their place, that place was certainly not the room the members met for scientific purposes in. It would never do for a student to begin analysis with a cigar in his mouth, nor to attempt to learn botany while playing at chess. The speaker concluded his interesting address amid the loud applause of his audience.

After a conversation relative to the formation of a Book of Prescriptions, the principals present promised all the assistance in their power to obtain some.

The Secretary then read the list of denatiens and the balance-sheet:—

RECEIPTS.

	£.	s.	d.
To Donations	13	9	0
,, Grant from Pharmaceutical Society	10	0	0
,, 22 Members' Subscriptions at 5s.	5	10	0
,, Allowance off Books		17	10
,, ,, ,, Bottles		2	0
	£29	18	10

EXPENDITURE.

	£.	s.	d.
By Furnishing Room, Shelves, Bench, Tables, Chairs, Form, Curtain, Baize, Blind, Calico, Brushes, Shovel, Scuttle, Hooks, Ladder, etc.	7	7	11½
,, Stationery:—Printing, Stamps, Paper, Envelopes, etc.	1	10	3
,, Carriage, Coal, and Cleaning Room	0	8	9
,, Books	4	19	6
,, Apparatus and Chemicals	6	13	10
,, Gas and Fittings	2	17	7
,, Balance in hand	6	0	11½
	£29	18	10

Examined and found correct.

A. LANCE
H. LESTER } *Auditors.*
F. BRANSON

The President next alluded to the dinner, which would take place the next day, to celebrate their finishing the winter session.

Mr. BARRY said he would not disparage for a moment the dinner, which he hoped and expected would be a great pleasure to the members, but he would suggest that they should not be of too frequent occurrence; one every year, or every second year would be very suitable, but if they tried more they would find, instead of binding them together, it would have the reverse effect. He was much pleased with the action of the Pharmaceutical Society, and the members would do all, he was sure, to show that the kindness had not been expended in vain.

Mr. BINGLEY expressed a hope that a similar association might be formed by the employers in the town.

Votes of thanks to the Chairman and Mr. Law, and Messrs. Bingley, Clarke, and Ashford, were moved and seconded, and also to the President for his services during the session, concluded the meeting.

BRISTOL PHARMACEUTICAL ASSOCIATION.

On Friday, May the 10th, a General Meeting of the Association was held at the Bristol Library and Museum, on which occasion a lecture was delivered by WM. LANT CARPENTER, B.Sc., upon "Ocean Currents."

After proposing a hearty vote of thanks to the lecturer, the PRESIDENT reminded the members that this was the last evening lecture of the session, and that their next gathering would be upon the occasion of the Annual Meeting in July.

TYNESIDE CHEMISTS' ASSISTANTS' ASSOCIATION.

At the rooms of the above Society, on Thursday evening, 16th inst., Mr. A. Anderson read a very interesting paper on "The Various Rhubarbs of Commerce." There was a numerous attendance of members, several of whom took part in the discussion which followed the paper; after which, a hearty vote of thanks was proposed by Mr. Bullus, seconded by Mr. Heslop, and carried unanimously. The meeting then terminated.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

Thursday, May 16th; Dr. Debus, F.R.S., Vice-President, in the chair.

The first paper read at this meeting was one "On the Influence of Pressure upon Fermentation, Part I.," by Mr. H. T. Brown; the results of his experiments being that, under diminished pressure, the amount of gas unabsorbed by potash is greatly increased, and that it contains a proportionally large amount of hydrogen. Acetic acid and aldehyd are also found under these circumstances, so that it would seem that water is decomposed during the alcoholic fermentation, especially when it takes place under diminished pressure.

Papers "On the Electrolysis of Sugar Solutions," by Mr. H. T. Brown; "On the Determination of Potassium," by Messrs. D. Page and A. D. Keightley, and "An Examination of the Recent Attack on the Atomic Theory," by Mr. Atkinson, were then read. The latter referred to Dr. Wright's paper on the Atomic Theory, recently read before this Society, and published in the April part of the Philosophical Magazine.

An animated discussion on the atomic theory ensued, in which Dr. Wright took part.

Mr. C. O'Sullivan then read his elaborate memoir "On the Transformation Products of Starch," and the meeting finally adjourned until Thursday, June 6th.

Professor Cannizzaro, of Palermo, will deliver the Faraday lecture "Sur les Limites et sur la Forme de l'Enseignement théorique de la Chimie dans les Universités," at the Royal Institution, on the 30th inst., at 8 o'clock.

PARIS SOCIÉTÉ DE PHARMACIE.

At the sitting of this Society on the 6th of March, under the presidency of M. Stanislas Martin, a paper that had been read before the Academy of Medicine by M. Hérard, advocating the use of tannate of quinine, gave rise to a discussion in which MM. Roucher, Poggiale, Bussy, Regnault, Bourgoin, and Petit took part.

M. Roucher said that the tannate was really efficacious, though less so than the sulphate, but that it could be employed with advantage in certain special cases.

M. Poggiale thought that it would be useful to determine first the composition and solubility of this salt.

M. Regnault said he had made some experiments in the preparation of this medicament. When acetate of quinine is treated with tannin, a turbid liquid is produced, which passes unchanged through the filter, and which it is impossible so to clear. This appears to show that the precipitate is very soluble in acetic acid; the addition of a little sulphuric acid, or even of sulphate of soda, leads to a decided separation. The tannate of quinine, well freed from sulphuric acid, is nearly insoluble in water, but soluble in alcohol.

M. Poggiale read an account of some researches of M. Cauvet upon rhubarbs.

M. Limousin read a paper on the preparation and purgative properties of sulphovinate of soda.

M. Bourgoin described a new process for the detection of adulteration of essence of bitter almonds by the so-called essence of mirbane, or nitrobenzol. He said that various methods had previously been indicated, but none of them had been quite satisfactory. The density of the nitrobenzol being greater than that of essence of bitter almonds, Vogel had proposed the estimation of the density of the suspected liquid. But the success of this test might be prevented by the addition of a sufficient quantity of alcohol, or other suitable liquid, to reduce it to the proper density. Dragendorff has recommended the addition of a globule of sodium to a mixture of a few drops of alcohol, and a small quantity of essence: colouration becoming more decided in proportion as the quantity of the adulterant is more considerable. Another process that would naturally suggest itself would be to distil the mixture in the presence of iron filings and acetic acid; to saturate the distillate with a little lime, according to Berthellot's method, and to develop a blue violet colour by means of a dilute solution of hypochlorite of lime. This test is a very delicate one when applied to pure nitrobenzol; but the presence of essence of bitter almonds singularly interferes with the reaction, and often only negative results are obtained with mixtures containing as much as 40 per cent. of nitrobenzol. M. Bourgoin proposes to treat a small quantity of the essence, about one gram, in a test-tube, with about half its weight of pure caustic potash, agitating it to favour the action of the alkali. If the essence be pure it will only assume a yellow colour, but if essence of mirbane be present, the yellow colour rapidly gives way to a reddish yellow tint, changing in less than a minute to a green colour. If then a small quantity of water be added the mixture separates into two layers, the lower yellow, and the upper green, which becomes red the next day. Alcohol does not interfere with these reactions; it seems, on the contrary to favour them, for the mixture becomes warm, and the green colour is rapidly developed.

M. Roucher said that he had prepared crystallized digitaline according to the process of M. Nativelle, as described by M. Buignet at the last sitting,* and that he had obtained very important results which he proposed to describe at a future meeting.

At the meeting on Wednesday, April 3rd, under the presidency of M. Stanislas Martin, a note was received from M. Pottier, of Auxerre, indicating a practical method for reducing alcohol to a desired inferior strength. The memoir was entrusted to M. Buignet for examination.

M. Bussy gave an account of the discussions that had taken place at the Academy between MM. Pasteur and Vergnette-Lamotte on the subject of the preservation of wines by the employment of heat.

M. Boudet referred to the following papers received by the Academy of Medicine:—(1) a note on Sydenham's laudanum, by M. Mayet; (2) a note on the same subject by M. Petit; (3) a memoir on the distribution of atropia in the belladona plant, by M. Lefort.

Upon the suggestion of M. Boudet, it was decided to appoint a committee to watch the proceedings of a committee appointed by the National Assembly for the purpose of investigating the subject of medical and pharmaceutical education on a proposition to concentrate the teaching of medicine at Paris.

M. Bussy called attention to a law recently passed by the National Assembly, enacting that the concentrated preparation known as essence of absinthe should only be made and sold as a medicinal substance, and that the commerce of the said essence, and its sale by pharmaciens, should only be carried on according to the legal prescriptions. He asked whether there were a tincture

* See *ante*, p. 865.

and an essence of absinthe in commerce beyond the absinthe of the liqueur dealers.

MM. Dubail and Adrian said that in the drug trade there was a considerable traffic in essence of absinthe, which preparation, with the addition of essence of anise, fennel, etc., served ordinarily for the manufacture of the absinthe liqueur, as the distillers rarely have recourse to the production of a true alcoholate. It was thought also that the names liqueur and tincture of absinthe were badly defined, and that it was necessary to settle this point before attempting to decide whether they ought to be considered as pharmaceutical preparations.

M. Petit said that he had been able to keep without sensible alteration dilute solutions (1 in 1000) of cyanide of potassium, cyanide of ammonium, and even of hydrocyanic acid. It was well known that cherry laurel water, which is a dilute solution of hydrocyanic acid, could be preserved without change for a long time, while a solution of one part in ten altered rapidly.

PHILADELPHIA COLLEGE OF PHARMACY.

At the Pharmaceutical Meeting of this Society, held April 16th, Professor Maisch presented the report of the Smithsonian Institution for 1870. The Professor also read a paper styled "Pharmacognostical Notes," which was referred for publication. Some remarks were made upon the use of Inula for hydrophobia, for which it has been asserted to be a positive cure.

Samples of an herb were exhibited by Professor Parrish, which is sold under the name of "wild tea," and used in cancerous affections. It does not appear to be the New Jersey tea *Ceanothus americana*. It was referred to Professor Maisch for examination.

Professor Parrish exhibited a sample of coated pills, sent from England, very handsome, but, as compared with sugar-coated pills, not so soluble.

Professor Maisch read a paper on the use of the volatile spirit of petroleum as a solvent for Oleoresins compared with Ether, which was referred for publication. Mr. Bullock remarked that some oleoresins were nearly insoluble in this spirit.

Professor Maisch detailed the result of his experiments on Monobromated Camphor, which he has succeeded in preparing without using hermetically sealed vessels, and thus doing away with the danger of explosions; a considerable quantity of hydrobromic acid is likewise obtained by this process, which, by the old method, was mostly lost. The experiments not being completed yet, the results will be communicated in detail at a subsequent meeting.

Mr. Boring exhibited a sample of purified suet, which was very handsome. It was made by treating the melted fat with table salt and alum, and after congelation, washing out the salts by large quantities of water; the re-melted fat is then benzoated. Professor Maisch stated that this was essentially the process employed by perfumers in purifying their fats for pomade.

SOCIETY OF ARTS.

April 24, 1872.

NUTS, THEIR PRODUCE AND USES.

BY P. L. SIMMONDS.

The subject on which I propose to address you may at first sight appear somewhat trivial and unworthy the notice of a scientific society. What is there, it may be asked, in nuts, of interest, commercially or scientifically, that merits attention or consideration which is not generally known? But I think, before I have concluded, I shall be able to remove any such superficial idea, and to show how large a part nuts play in commerce, and how important are the uses of their several products, as evidenced by the fact that we pay more than 3½ millions yearly for nuts and the products of nuts.

But first it is necessary to define what a nut is; and here I fear we shall meet with numerous conflicting opinions. In the popular sense of the term, it would probably be described as some seed, with a hard shell enclosing a kernel; but then chestnuts and other thin-shelled fruits vary the idea. The strict botanical designation would probably be a fruit consisting of a hard pericarp, surrounded by bracts at the base, of which the acorn and the filbert are examples. The seed-vessel, enclosed within an involucre or husk of the cultivated hazel-nut, is of the same nature as the cup of the acorn and the prickly case in which the nuts of the chestnut and the beech-mast are enclosed. Most probably my learned friend in the chair, if asked to define a nut, would state it to be synonymous with gland—an inferior, dry, hard, indehiscent, one-celled, one, or rarely two, seeded fruit. It is also applied to a superior fruit by some botanists, of a similar character in some respects to the above, as in the cocoanut. Nut is also applied to such fruits as those of labiate and boraginaceous plants, which are properly "achenes," and defined as a dry, one-celled, one-seeded, indehiscent fruit, with a hard covering. Willdenow's definition was, "A seed covered with a hard shell, which does not burst." N. Bayley's 'Dictionary,' revised by Dr. Scott, and published in 1764, defines a nut as "a fruit or kernel included in a shell, or a seed included in a brittle but not stony shell; if the shell and kernel are in the centre of a pulpy fruit, they then make not a nut, but a stone." But as I am about dealing with the subject commercially, and not botanically, I shall have to extend the range of definition very largely to take in all that are called nuts in commerce. The merchant and the broker are very lax in their designations; all, for instance, are *gums* to them, whether soluble, resinous, elastic, or mere inspissated extracts. So with many of the nuts of commerce, such as almonds, the seed of drupes, nutmegs, myrobalans, coquilla, cohune, candle-nuts, ground-nuts, *cum multis aliis*, which are not botanically nuts.

A variety of special dealers have certain so-called nuts in their trade.

The fruiterer and the Italian warehouseman have their edible nuts in cocoanuts, Brazil nuts, small nuts (Spanish and Barcelonas), cobnuts and filberts, walnuts, chestnuts, peccan and hickory, butter-nuts, sapucaya, pistachio, and cashew-nuts, seeds of the pine cones, besides the prepared *marron glacé*, candied, burnt, and sugared almonds, etc.; the grocer, his bitter and sweet almonds and nutmegs, his sassafras and Ravensara nuts; the oil broker, his ground-nuts, candle-nuts, palm-nuts, palm-kernels, oil nutmegs, bassia-nuts, and others; the turner, his coquilla, vegetable ivory, cohune, betel-nuts, and others; the druggist, his nux vomica, physic-nut, and cumara-nuts, or tonquin bean; the tanner, his nut-galls, myrobalans, also called gall-nuts in India, and bedda-nuts, valonia, or acorns and cups; even the coal merchant has his nuts, in a description of small coal so termed. Then there are hundreds of other so-called nuts which have limited but special uses, such as the marking-nut, the clearing-nut, the soap-nut, and the Bonduc nut.

To some of these nuts I propose directing your attention; and although it is somewhat difficult, from the varied uses of many, to strictly classify them, I will endeavour to throw them into a few groups which shall comprise, 1, the edible nuts; 2, the oil nuts; 3, the turnery nuts; and another group, which may include those of a miscellaneous character.

The following table gives an aggregate view of the value of our imports of nuts and their products for the latest year for which the official returns are published—1870:—

	Quantities.		Value. £
Almonds (sweet), cwt. ..	36,189	..	138,864
,, (bitter) ,, ..	7,618	..	20,966
Chestnuts, bushels......	31,767	..	22,108
Cocoanuts, No.	3,546,276	..	30,622

Small nuts, bushels	294,236	..	193,452
Walnuts ,, ...	152,681	..	42,638
Turnery and unenumerated nuts	-	..	42,972
Ground-nuts, tons	5,845	..	94,419
Other oil nuts, tons	18,033	..	231,123
Nutmegs, lb.	537,978	..	32,510
Palm oil, cwt..........	868,270	..	1,583,830
Cocoanut oil, cwt.	198,602	..	392,657
Coir fibre, tons	1,105	..	24,347
Cordage of ditto, cwt. ..	11,407	..	13,547
Cable yarn ,, ..	168,544	..	177,956
Myrobalans, cwt.	56,610	..	32,928
Valonia, tons	25,718	..	395,546
Nutgalls, cwt..........	17,748	..	54,169
			£3,524,657

EDIBLE NUTS.

The commerce in edible nuts of various kinds forms a considerable item, and furnishes a carrying trade of at least 10,000 tons. The average annual value of those sold amounts to upwards of £500,000. There are but five sorts specified in the official trade returns—almonds, chestnuts, cocoanuts, small nuts (hazel-nuts), and walnuts, but there are various other kinds forming articles of commerce in a minor degree, among which may be enumerated Brazil nuts, pistachio-nuts, cashew-nuts, souari and sapucaya-nuts, hickory and peccan nuts. Twenty years ago it was stated that the sale of filberts in Covent-garden amounted to 1000 tons in the year, and of walnuts, 25,000 bushels. Of the quantities grown in England there are no means of forming an estimate. The imports of nuts in 1848 were:—

	Bushels.
Hazel-nuts	150,022
Chestnuts	63,033
Walnuts	29,604

The progress of the import trade in these is shown by the following figures, from which it will be seen what a great advance has been made in the consumption of sweet almonds, walnuts, small nuts, and cocoanuts:—

	1855.	1860.	1870.
Almonds (sweet), cwt.	24,581	19,638	36,189
,, (bitter) ,, ...	7,366	7,361	7,618
Chestnuts, bushels........	64,756	25,218	31,767
Cocoanuts, number	2,217,350	2,479,251	3,546,276
Small nuts, bushels	243,458	198,563	294,236
Walnuts ,, ...	21,949	52,090	152,681

I now proceed to give a few details as to each of these kinds of nuts.—

Hazel-nuts are the fruit of the wild bush of *Corylus avellana*, unchanged and unimproved by cultivation. They seldom attain to any size in this country when left wild. The fruit differs from that of the domesticated varieties only in being smaller, while the tree is more hardy. The plant, which is a native of all the cooler parts of Europe, Northern Asia, and North America, is the parent of the many varieties of nuts and filberts now cultivated for their fruit. The trade in "small nuts," as they are termed in the official reports, does not vary very greatly in this country, perhaps 10,000 bushels more may be imported in one year than another. The maximum never exceeds 300,000 bushels. Of 294,236 bushels received in 1870, the bulk came from Spain, 14,000 bushels from Sicily, and about 11,000 from Russia, Turkey, and other countries. Their import value is from 10*s*. to 13*s*. 6*d*. a bushel. In commerce, though both produced by the same variety, *Barcelonensis*, the nuts are classed into two kinds:—1. The Spanish, which are the nuts coming from Gijon. They will not keep any time, and are said to be coloured by the dealers with the fumes of sulphur. They arrive in bulk in small schooners. 2. The Barcelonas, which are kiln-dried, and shipped from Tarragona to the extent of 8,000 tons a year, in bags of about 128 lb. In Russia and Turkey large quantities of fine nuts are produced of the Constantinople variety (*C. colurna*), which are roundish and very hard. 160,000 cwt. are annually raised at Trebizond and Kuirasond. The filbert has been referred to a distinct species, *Corylus tubulosa*. The term was originally applied to those kinds of nuts which have very long husks, and in which the nut is also of a lengthened shape; but owing to the number of varieties that have of late years been obtained, this distinction, which was never scientific, appears to be nearly disregarded, and nuts and filberts are almost synonymous terms, excepting that the wild, uncultivated fruit and those varieties which most nearly approach to it are never called filberts.

The best known varieties of the filbert are the white, the red, and the frizzled. The white is the kind most commonly grown in this country. In Kent many hundreds of acres are planted with filberts, for which the county is celebrated, and whence the London market is principally supplied. As much as 30 cwt. per acre has been raised on particular lands. When quite ripe, filberts will keep for several years in a dry room, and if the air is excluded, or the nuts placed in an air-tight jar, they will be sound and retain their flavour for an indefinite period. The hazel-nut yields about 60 per cent. of a bland oil, which is used by perfumers.

The cob-nut of Kent is a large, roundish, prolific variety—*grandis*—of the ordinary hazel-nut.

In almost every stage of its growth, the fruit of the walnut-tree is used. When young, green, and tender, walnuts are pickled and preserved with the husks on. About the end of June they may be preserved with or without the husks. When the nuts are fully ripe, which is generally at the end of September or the beginning of October, the kernel, deprived of its investing skin, is eaten in great quantities. As long as the skin can be easily removed, they are a nutritious and healthy article of diet; but when they get dry, so that their skins stick to them, they become indigestible.

The larger portion of the walnuts consumed in England are of foreign growth, and the imports are annually increasing; for whilst a quarter of a century ago we only imported 20,000 bushels, now we have come to require 153,000 bushels. The bulk of these come from France and Belgium, and small quantities from Holland and Italy. Their value is much less than that of small nuts, being only from 5*s*. 6*d*. to 6*s*. 6*d*. a bushel.

The albumen, which constitutes the bulk of the seed of the walnut, contains an oil which is used in large quantities, especially on the Continent. It is obtained by reducing the seeds to a pulp by means of a stone wheel and basin, and then expressing the oil, first without heat, and then by the application of heat.

In the provinces of the Peninsula where the olive does not grow spontaneously, and cannot be cultivated except in certain places having an equal temperature, as on the banks of the lakes, walnut-trees have been planted from time immemorial. They yield an oil which, when fresh, is used for food and lighting purposes, or for painting when it becomes rancid. In the north of Italy, in the valleys of the Alps, and also of the Apennines, the walnut-tree forms and gives its name to a special botanical region.

In Nassau and Switzerland this bland oil is much used, and is no bad substitute for olive oil in preparing salad. It is also expressed in Cashmere. The shells of the large kinds of walnuts are often mounted with hinges, as fancy receptacles for miniature articles, such as tiny wax dolls, scissors, thimbles, etc. The Limerick gloves are packed in walnut-shells, whilst rings, jewels, and other small presents are occasionally disguised in this rough case as an agreeable surprise.

Our trade in foreign chestnuts, the fruit of *Castanea* *vesca*, is not large, and has scarcely ever reached an import of 70,000 bushels. In the three years ending 1831 the average was 21,000, and they then paid a duty of 2*s*. a bushel. In 1842 the imports were 34,000 bushels. In 1855 the imports had advanced to nearly 67,000 bushels, but they have since fluctuated and declined. Of the imports in 1870 (31,767 bushels), about half came from France, and the remainder from Portugal and Spain. They are valued at 11*s*. to 17*s*. a bushel, those from the Peninsula being considered the best. The local consumption of chestnuts in France is said to be about six million bushels annually. In Spain, Corsica, and the North of Italy, they form an important article of food, and serve in a great measure as a substitute for potatoes and bread. The best are those which permit of being kept good for several months. This is done by preserving them in layers of straw or in sand. In parts of France and Corsica the fruit is husked and dried.

The kernel of the Tahiti chestnut (*Inocarpus edulis*), which is kidney-shaped, and about an inch in diameter, is eaten when roasted by the Pacific Islanders, and in New Guinea and the Moluccas. It is sweetish, but less pleasant than the chestnut, harder and not so farinaceous.

The large and handsome seeds of the Moreton Bay chestnut (*Castanospermum Australe*) are eaten by the natives in Queensland, but Europeans assert that they are hard, astringent, and not at all better than acorns. A good starch has, however, been made from them.

The almond is one of our important edible nuts of commerce. Prior to 1832, when the duty was reduced, the consumption of almonds, here, was only about 3000 cwt.; in 1836 it had sprung up to 8000 cwt., and now it has reached about 43,000 cwt., an evidence of the progress of commerce and the advantages of lower prices, for in 1839 the prices of the best Jordan were £9 to £10 per cwt.; Valencia, £4 to £10; and Barbary bitter, £2. 10*s*. Now the best Spanish are about £6. 10*s*.; other sweet kinds, £3 to £4, and Barbary bitter, £2. 10*s*. The imports in 1860 were 7361 cwt. of bitter almonds, and 19,631 cwt. of sweet almonds. In 1870 the imports of bitter were about the same, but of sweet the quantity was 36,189 cwt. The Valencia almonds are the largest and broadest in the kernel of any. The Jordans, which come from Malaga, are longer and narrower, with a more pointed kernel, about an inch long. The Barbary sweet and bitter are both small, irregular-shaped almonds. The Sicily almonds, although small, are larger and plumper than the Barbary.

The study of, cultivation, and commerce in almonds is one of considerable importance, for the fruit enters largely into domestic and other uses, forming a principal ingredient in cookery, medicine, and trade. The Provence almonds of France are soft-shelled, sold ordinarily in the shell. The "Princesses," consumed in France, Belgium, Holland, Germany, and Russia; the "Ladies," sent chiefly to the United States; wavy almonds, which keep the best, and realize double the prices of the ordinary varieties. These are principally used in confectionery, as burnt almonds, and for fine pastry. The bitter almonds are used in the preparation of liqueurs, macaroons, and different medicinal compounds. A bland oil is expressed from almonds, which is used in medicine. It is obtained alike from the sweet and bitter varieties, and is of the specific gravity ·915, of a pale yellow colour, but becomes colourless when long exposed to the light. It soon grows rancid. It is so plentiful, that 5½ lb. of almonds have yielded 1 lb. 6 oz. of oil by cold extraction, and ¾ lb. more on heating them.

The Brazil nuts of commerce, called castanhas in Brazil, are the seeds of *Bertholletia excelsa*. About twenty of these nuts are contained in cells, within a hard spherical capsule. They form a delicious fruit when fresh, and also yield a large quantity of oil. One pound of nuts will afford 10 ounces of a pleasant, bland, clear, yellow oil, which might be furnished in abundance to the markets of the world. It has a great tendency to change if kept, but is used for culinary purposes when fresh. About 90,000 bushels, valued at £36,500, are annually shipped from Para, and they arrive in bulk in small schooners. The first arrivals will often fetch about 42*s*. per barrel of 3½ bushels.

The nuts in the drupe of the *Pistacia vera* and its varieties, natives of Syria, are imported in small quantities here, shelled or unshelled. The pale green kernels have a flavour like sweet almonds, and are used as a dessert fruit in cooking and in confectionery. Although they are not now enumerated in the Board of Trade returns, in 1855 we imported 3210 cwt. of these nuts. The imports are, however, much less than this now. On the Continent and in Turkey pistachio nuts are much esteemed. From Aleppo the exports are about 1300 cwt. yearly. One of our large West-End perfumers (Piesse and Lubin) make large use of the pistachio nut in its meal, much recommended as a substitute for soap, pistachio-nut soap, and pistachio oil for the hair, which is said to be used in Spain for the raven tresses alike of the mountain peasant and the court beauty; and a powder and milky emulsion for the complexion are also made from it.

Pine seeds are an edible nut in very many countries. Those of the stone pine (*Pinus pinea*) are largely used at dessert with wine in Italy, under the name of pine nuts. They are brought to market at Lisbon, strung upon threads like beads, and suspended upon a girdle round the waist. The seeds of Lambert's pine, in North America, of Slave's pine, in Mexico, and of Gerard's pine, in Thibet and Affghanistan, are also eatable when fresh. In Switzerland the seeds of the Siberian stone pine are used in some places as food, and in others as an article of luxury. The shell being very hard, and requiring time and skill to separate it from the kernel, the doing so forms an amusement for some persons in the long winter evenings. The pinones of the imbricated-leaved pine of Chili are a chief article of consumption among the Indian tribes. As the seeds will keep long, they are often imported into the southern districts of Chili from the Cordilleras, and when boiled are eaten by the country people either hot or cold. The seeds are buried in pits by the Indians for winter use. Another species of *Araucaria*, whose fruit is called bunya-bunya by the natives, forms the principal article of their food in Northern Australia. The cone is very large, nine to twelve inches in length by nine inches in diameter. The seeds, which are readily shed, are from two to two and a-half inches long by three-quarters of an inch broad, sweet before they are perfectly ripe, and after that resemble roasted chestnuts in taste.

The seeds of the cones of *Pinus monophyllus*, of the Rocky Mountains, constitute the principal subsistence of some of the Indian tribes.

(*To be continued.*)

Parliamentary and Law Proceedings.

Sale of Vermin Poisons.

On Thursday, May 10, Mr. F. Price, coroner, held an inquest at Salford, concerning the death of Mary Hughes, aged 23 years, who died on Tuesday from taking some of "Gibson's Manchester Vermin Killer," which she had purchased at the shop of Mr. R. Duncalfe, chemist, Swan Street, Manchester, on the same day. The jury appended a recommendation to their verdict that greater restrictions should be placed on the sale of vermin powder containing poison. The coroner intimated that he had already communicated with the Pharmaceutical Society on the subject, and he would see that the suggestion of the jury should be forwarded to that Society and to the Home Secretary.—*Manchester Courier*.

Poisoning by Laudanum.

A case of poisoning was investigated by a coroner's jury at Kidderminster on Saturday, May 11th. A Mrs. Beames, the wife of a carpet weaver, had been in the habit of giving her child soothing syrup, and in a bottle similar to the one containing the syrup she had some laudanum. Intending to give the child some soothing syrup on the Wednesday, she accidentally took up the wrong bottle and gave it a dose of laudanum. The mistake was discovered an hour or two later and medical assistance obtained, but the child died. The jury returned a verdict that the poison was accidentally administered.—*Times.*

Poisoning by Carbolic Acid.

On Saturday, May 11th, an inquest was held at Maryport, touching the death of a carman, named Adams. It was shown that on the previous Thursday the deceased had been engaged in removing some furniture, and that while the cart was unloading he asked for some drink, and was told to go into the kitchen and help himself from a bottle of beer he would find there. It is supposed that in mistake deceased drank from a bottle containing carbolic acid; for, on returning, he complained that the beer was bad stuff. He soon became very unwell, and died the following day. While still sensible, he stated that he drank the poison out of the supposed beer bottle. The jury returned a verdict of accidental death from drinking carbolic acid.—*Carlisle Journal.*

The Jury System.

Among the gentlemen summoned to serve on the Grand Jury at the Central Criminal Court was Mr. Edward Thompson, a solicitor, who claimed exemption on the ground of his professional occupation.

The Court told him that, although he was legally exempted from serving by reason of his being a solicitor in practice, still, as he had allowed his name to appear in the jury list, the Court had no power to release him from serving. It was the duty of every one liable to be summoned under the new Jury Act to take care, if he was exempt, that his name was expunged from the jury list, for, if once the name was placed upon the list, the party was bound to serve.

Mr. Thompson was accordingly sworn upon the Grand Jury.—*Echo.*

[*⁎* A correspondent, in calling attention to the above case, points out that the ruling of the Court would apply to pharmaceutical chemists, so that it is therefore advisable for them at the proper time to examine the jury lists, to see whether their names are improperly placed theron, and if so to claim exemption before it is too late.—Ed. Pharm. Journ.]

The Shipping of Benzine.

On Tuesday, May 21st, at the Thames Police Court, George Curling, manufacturing chemist, of No. 17, St. Mary-Axe, City, was summoned before Mr. Lushington, charged with shipping a case of benzine without notifying the contents of the same by writing or in print on the outside of the case or box.

Mr. Charles Young, solicitor, appeared for the East and West India Dock Company, who prosecuted in this case.

From the opening statement of Mr. Young it appeared seven cases were sent from the defendant's premises to the Dock on the 9th of May. They were described and marked on the outside as patent medicine. The cases were shipped on board the ship Otago, lying in the Dock, on the 11th of the same month. One of the cases was afterwards found to be running, and upon opening it, it was found to contain benzine. The other six cases contained what they were represented to be, namely, patent medicine. There were four dozen bottles of benzine in the case, and on each of them that were labelled the benzine was described as being inflammable at 100 degrees of Fahrenheit. The ship Otago was bound to New Zealand, and called at Erith, down the river, to take a quantity of gunpowder on board. She also carried passengers that were going to New Zealand. The case ought either to have been marked on the outside relative to its contents, or else information should have been given to Superintendent Sheppy, of the Dock Company's own police, who would have seen that the box was properly labelled, and a description of its contents made known to the captain whom it was shipped with.

The defendant said an order was sent down to his firm for the shipment of various articles. It was an act of carelessness that the case containing the benzine was not marked describing its contents. He was totally unaware of the contents of the cases sent on board the Otago until he saw the bottle produced containing benzine.

Mr. Lushington saw no reason to mitigate the penalty, and find the defendant £20 and 12s. costs.—*Daily News.*

BOOKS RECEIVED.

A Manual of Chemical Physiology, including its Points of Contact with Pathology. By J. L. W. Thudichum, M.D. London: Longmans. 1872.

Air and Rain. The Beginnings of a Chemical Climatology. By Robert Angus Smith, Ph.D., F.R.S., F.C.S., etc. London: Longmans. 1872.

The Students' Pocket Companion to the British and London Pharmacopœias of 1851 and 1867. By George Barber, Pharmaceutical Chemist, Liverpool Sixth Edition, revised and enlarged.

Lecture Notes for Chemical Students. By Edward Frankland, D.C.L., F.R.S., etc. Vol. II. Organic Chemistry. Second Edition. London: John Van Voorst. 1872.

The Chemical Note Book: for the Use of Students. New Edition. London. S. Deacon. 1872.

MEETINGS FOR THE ENSUING WEEK.

Monday, May 27. — *Society of Arts,* at 8 p.m. — "Silicates, Silicides, Glass and Glass Painting." By Professor Barff (Cantor Lecture).
London Institution, at 4 p.m.—"Elementary Botany." By Professor Bentley.

Tuesday, May 28. — *Royal Institution,* at 3 p.m.—"Development of Belief and Custom." By Mr. E. B. Tylor.

Wednesday, May 29. — *Royal Medical and Chirurgical Society,* at 8.30 p.m.

Thursday, May 30. — *Royal Society,* at 9 p.m.
Royal Institution, at 3 p.m.—"Heat and Light." By Dr. Tyndall.
Chemical Society, at 8 p.m.
London Institution, at 7.30 p.m.—"Experimental Evidence against the Spontaneous Generation of Living Things." By W. N. Hartley, F.C.S.
Gresham College, at 7 p.m.—"Prescriptions." By Dr. E. Symes Thompson (Gresham Lecture).

Friday, May 31. — *Royal Institution,* at 9 p.m.
Gresham College, at 7 p.m. "Mineral and Vegetable Tonics." By Dr. E. Symes Thompson (Gresham Lecture).

Saturday, June 1. — *Royal Institution,* at 3 p.m. — "Chemical Action of Light." By Professor Roscoe.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

The "Profession of Pharmacy."

Sir,—I am glad to find Mr. Ellwood raises the question as to the correctness of the term "profession" as applied to pharmacy; and although it is one of no great importance, yet one often has one's sense of propriety violently offended by hearing some would-be professional using the term to his own magnification, while at the same time he has the least possible claim to it; but where ignorance is bliss, 'tis folly to be wise.

Pharmacy is a *quasi* science, and the practice of pharmacy, or the calling of a pharmacist, is like Mahomet's coffin, it is neither in earth nor heaven, but between both.

The term "profession" may be defined as the practice of any special knowledge for the good of the public, for a fee or honorarium, as distinguished from buying and selling, or payment by wage or salary; and honour is the corner stone of all honourable professions.

I do not deny that all pharmacists are entitled to use the term as applied to themselves, because there are many in our ranks who stand prominently to the front, and add to the practice of pharmacy other sciences, which they practise in every way as a "profession." But it is contemptible to hear the term abused in the way it often is, and applied to people whose culture is of the mildest type; and I echo Mr. Ellwood's concluding prayer, and join in his hope, that the day will soon dawn when pharmacy will be raised to its proper status and dignity.

F. M. Rimmington.

Bradford, May 11th, 1872.

Sir,—Pharmacy is at last assuming its proper rank as a branch of the medical profession. While it was open to all comers, a living out of pharmacy proper was impossible, consequently pharmacists became tradesmen. It is now so protected that it may gradually take its natural position, as in France and Germany. To promote the recovery of its true status, pharmacists should aim at a few special things: to encourage the discontinuance of dispensing by medical men, to relinquish prescribing, and to get rid, bit by bit, of that traffic in things not medicinal, which is the sole reason of its professional character being questioned. There is a course between presumption and depreciation, which the most modest pharmacists may now observe. They are members of a profession, and also tradesmen. They should claim the one appellation, and not disdain the other; but they should at the same time do all in their power to elevate the important calling to which they have devoted themselves, so that the next generation may not be critical when they hear it referred to in common parlance as "the Profession of Pharmacy."

Avalon.

The Social Status of Pharmacists.

Sir,—I have read with much pleasure Mr. Greenish's paper on "Pharmacy in Austria," and the discussion at the pharmaceutical meeting of the 1st instant, to which it gave rise. The issue of the latter seemed finally to limit itself to the question of the social condition of the trade in this country.

In a letter you did me the honour of publishing in November, 1869, I took occasion to observe, that, in my opinion, English pharmacists would take rank only in proportion as they eliminated from their wares such as form no part or parcel of their legitimate business, and I venture to regard the matter in the same light now as then.

Over-crowded, however, as the trade is at the present time, the prospect of attaining to especial distinction from among our fellow-shopkeepers by a commerce in things purely pharmaceutical, appears to me as remote as ever, since the adoption of the measure would involve on the part of the majority of our brethren neither more or less than pecuniary annihilation.

In Austria, Germany, and the States of northern Europe, I am aware that the apothecaries make a low estimate of the money value of materia medica, and of the skilled service required in their preparation, but the number of pharmacies being limited by law, the matter is counterbalanced by the fact that their practices are very considerable, and the amount of business transacted unusually large.

In Italy and France, where, to the best of my knowledge no restriction of the kind is in force beyond the provision that a man may not conduct two separate establishments (a provision easily evaded by working the second in another name), far higher remuneration is exacted.

The profession of pharmacy in these countries, however, in spite of the prevalence of good prices, and the social advantages enjoyed by those engaged in it, is not, broadly considered, in a prosperous condition.

The cause may be briefly referred to the fact that the *Pharmacien* or *Farmacista* holds it a duty to confine his pursuits to the immediate object of his calling, an exclusive principle undoubtedly prejudicial to his worldly interests in the face of so much competition.

With reference to ourselves, I quite agree with Mr. Groves—and the feeling he remarks may, I think, be traced from the time of Shakspeare to our own—that "it is customary to look down on pharmacists" who, although generally admitted to be an intelligent body of tradesmen, are somewhat contemptibly considered as a class whose "good" is borne on the "ill-winds" that scourge society at large, yet withal a struggling and impecunious section of humanity. To the ordinary English mind, this last failing is, I fear, an all-sufficient reason for their being held in low esteem.

While gratefully acknowledging the many important benefits already conferred on the trade by the protective influences of the Pharmaceutical Society, I would fain indulge in the hope of seeing still brighter days dawn on our efforts to emancipate ourselves from the old social ban.

Walter A. Powell.

Castle Street, Swansea, May 11th, 1872.

Emulsions.

Sir,—Mr. Rother, in his very practical Paper on the above, reprinted in your Journal of May 11th, has made known a perfect method of preparing an emulsion of turpentine with mucilage, hitherto, at the best, but an unsatisfactory performance; there is however, one point essential to ensure complete success, which has apparently escaped his attention, and that is the use of fresh mucilage. Following his directions, 2 drams of mucilage speedily emulsified $1\frac{1}{2}$ oz. turpentine, this with $\frac{1}{2}$ oz. of water produced a mixture containing two-thirds of its bulk turpentine; four days afterwards it still remains as perfect an emulsion as when freshly prepared, and promises to remain so. As a further test of its permanency, 1 dram of the mixture was diluted with 7 drams of water; after standing a few hours a "cream" only was thrown up, which may be perfectly reincorporated by shaking. I repeated the experiment, substituting sour mucilage for fresh, and found the trituration has to be continued for a much longer time; the emulsion is not so white, and though no actual separation of turpentine takes place on standing, still it is not near so homogeneous as when the fresh mucilage is used. What is rather surprising in this method is the remarkable property possessed by the mucilage of "killing" almost an unlimited quantity of turpentine. To ensure a permanent emulsion, a good deal of time and persevering trituration are necessary, combined with judicious additions of ingredients; and this is just one of those cases where a careful and discriminating operator will succeed, and the careless one make only a mess. This plan I find gives a result much superior to that detailed in the Journal of March 16th, by shaking powdered gum with turpentine, then adding the water, as this very soon separates into distinct layers of turpentine and water, and presents altogether an unsatisfactory appearance.

T. H. Hustwick.

Liverpool, May 18th, 1872.

Pharmaceutical Education in the Provinces.

Sir,—In your Journal of April 27th, I find a letter signed "A Country Major Associate," in reply to which I should like to say a word or two.

I quite agree with him that in provincial associations a very great difficulty is to find teachers, but that is no reason why they should not receive pecuniary aid from the parent society, but rather the contrary. Students in the country do not expect to receive instruction from duly qualified gentlemen for nothing; but if the parent society will give them no aid, they must either go without altogether or ask to have it gratuitously. The expense of going to London and attending Bloomsbury Square, does form a great barrier to hundreds of country students; but this "Country Major Associate" says that they had no right to enter the trade. Perhaps he has not yet learnt that the trade is free for any one to enter. Those who can afford to pay for high-class training will not enter the trade, as it will not pay for the large outlay required, while if the Society did its duty to provincial associations, there would be no necessity for country students to attend Bloomsbury Square. Provincial associations would be as much use to the country as the Square is to London, were they not crippled by want of funds. "Country Major Associate" seems to think £100 not too much for a course of chemistry, and that the teacher must be a high class professor with no end of degrees and diplomas. In most towns it would be difficult to find such an one, while the work would just as well be done by any gentleman who has passed the Major, for £20, and the same with botany, etc. I admit that provincial associations are greatly dependent on voluntary teachers; but this state of things is a disgrace to the whole community of chemists and druggists. "Country Major Associate's" reason for not spending £300 a year over provincial associations is rather a novel one,—as it is impossible to give £300 don't give any. I think the Society ought to give £100 a year to each of the existing associations, and surely it can afford this out of £10,000 a year. The Society gets at least £5 from each student, and is it not common honesty to give a little in return? I should think that in reviewing its past life, there is no act upon which the dying Council can look with so much satisfaction as its giving £48 out of an income of £10,000, to educate the pharmacists of the future. Is the revenue of the Society derived in the proportion of £9,950 from London, to £50 from all England? Besides, for the Society not to give aid to provincial associations is a proceeding fraught with the gravest danger to the Society itself. The rising pharmacists will grow up to look upon it with dislike as a Society which has done its best to thwart them in their efforts to educate themselves, and to rob them by exorbitant fees. Let it remember that the assistants and apprentices of to day will be masters in their turn, and take warning ere it is too late. Provincial members expect something for their subscriptions; they cannot attend evening meetings, or have access to the library, and naturally they expect some indirect good to themselves in the shape of help extended to their assistants and apprentices. We know what centralization has done for France; the Society, on the small scale, is doing as France did, and if an alteration is not made, and that at once, there will be the same result.

Judging from his letter, I should say, that "Country Major Associate" is one of those who look upon the business of a chemist and druggist as a profession, and pharmacy as a scientific pursuit for wealthy, learned gentlemen. I would venture to remind him that in nine out of ten cases, the proprietor has to get a living by his shop, not to pursue a scientific pastime, and that until surgeons leave off dispensing, the business of a chemist and druggist will be a trade, not a profession, and by no means a very profitable or pleasant one either.

G. T.

May 8th, 1872.

Sir,—Some few weeks since you were kind enough to insert my remarks on "Compulsory Education," and, amongst other matters therein stated, the education of apprentices was incidentally touched upon.

Since then, we have had in the Journal two, if not more, editorial articles, and several letters from leading chemists, almost entirely devoted to this subject.

Perhaps Mr. Atkins and Mr. Giles may be right in the main; but the latter, as the exponent of high class pharmacy, is not likely to bring over the great bulk of the trade to his views.

I believe we are most of us open to conviction; but, on the other hand, we object to being dragooned to meet other people's tastes and fancies.

Mr. Rimmington's communication contains many points well worthy of consideration, as also does the letter by a Country Chemist, "A Plea for Weak Brethren."

Being very anxious to ascertain the views of country chemists upon this important subject, I have taken advantage of every opportunity for discussing the question with them, and there seems to be very little difference of opinion upon the matter; we are all pretty well determined as to what we mean to do.

Now, before another word is said upon pharmaceutical education, let us take a glance at what is going on at the present day, in the higher profession of medicine. What do we see? Why in this town of 50,000 inhabitants, and in the villages round, there are many medical pupils; do the medical practitioners who take these pupils provide in their establishments dissecting rooms and museums for teaching them? No such thing! Are lectures and classes provided for them? Certainly not; the nearest medical school being between twenty and thirty miles from this.

Well, what do they do? Just this. Supposing they are wise and studious, and wish to get on, they avail themselves of every opportunity for study and for the acquiring of practical information. At the end of the term (we will take it for granted the Preliminary has been already passed) they go to London, or elsewhere, to attend hospital practice and lectures, and having passed their examination, they quietly settle down into a country practice.

Others, whose means are more ample, and who are ambitious of a higher standing, take the office of house surgeon, demonstrator, etc., fix themselves either in the metropolis or one of our large centres of population, and become great in their profession; and between these two classes there will always exist many different ranks and orders.

Now, apply this to the case of pharmaceutical pupils or apprentices. Speaking for myself, I intend to go on as we are now doing—to endeavour to select only such youths as have had a good education, and who appear to have an aptitude and taste for study, and who have the means necessary for defraying all reasonable expenses incidental to the requirements expected from them.

Of course proper arrangements will be made for allowing time for book study, and as far as circumstances will admit, and may be thought desirable, we shall make them acquainted with most of the ordinary pharmaceutical preparations; but what we shall not do is to take apprentices (as Mr. Giles demands) without calculating upon their doing any work, nor shall we turn our places into chemical laboratories, nor suffer ourselves to become laboratory teachers.

The facilities we offer will, we conceive, impart a good groundwork for further and higher instruction to follow. And to those who seek something higher and better, we must point out the Clifton sanctum, and other similar institutions, or as we conceive much better still, a short period of study in the Pharmaceutical School at Bloomsbury after they have concluded their apprenticeship.

The establishment of classes and lectures and other means for imparting knowledge should, by all means, be encouraged, but it seems to me most unreasonable that this should in any way be done out of the funds of the Pharmaceutical Society, particularly when so small a proportion of the trade is contributor to its funds.

If this sort of pampering goes on it will only cause a dissatisfied spirit to spring up amongst our young men. Instead of feeling that self-dependence which alone can give strength and vigour, they will be looking for help, first to this quarter and then to the other, and blaming everything and everybody but themselves as the cause of failure.

Let us do away with this paltry attempt at parading a pauperism which really does not or ought not to exist, and whatever plan for education may be determined upon, seek to make it self supporting.

I am convinced that two of the greatest sources of evil, with regard to the subject before us consists, first in the custom of taking youths as apprentices at too early an age, and secondly in their want of proper training during the time they are at school. The cure for the first is in our own hands. I would suggest that none should be taken younger than 16 years of age.

The second is not so easy to find a remedy for. For instance, I am seeking an apprentice. I apply to our principal schools, but cannot learn that those who have passed any of the examinations think of being chemists. I advertise, and from among other candidates I select one who has had three years' education at one of our Grammar schools, and finished off with two years instruction at a classical and collegiate school near London.

The printed report given him on leaving was of a very high character; but after two years with me and average allowance of three hours a day for study, I much question whether he could now pass the preliminary—partly owing to a bad system of school training, and partly, perhaps to carelessness and indifference on his part about the matter. My other apprentice has also had equal, if not higher advantages, but with not much better results.

The deficiency in school education seems to be, that the mental faculties are not properly called into play. Hence, although they can remember a good deal that has been committed to memory, they cannot write six lines correctly upon any given subject from their own composition.

It is as true now as it ever was that there is no royal road to learning; it is clearly patent to all who will open their eyes to see that, without patient toil and labour, no great progress can be made in any branch of knowledge or of art. But the youth who desires great things, aims at great things, and patiently strives after great things, humanly speaking, is almost independent of circumstances, and is sure to succeed; whilst, on the other hand, those who prefer spending the greater portion of their time in idleness and frivolity, cannot expect to make way; and they do not.

The truthful experience of a tolerably active life is this, that comparatively few of our young men care to give themselves the trouble to acquire those habits of thoughtfulness and patient perseverance without which a man had far better adopt some other sphere of labour than that of a chemist and druggist.

One Who Has Known the Drug Trade More Than Thirty Years.

The Alleged Poisoning at Newton.

Sir,—In your issue of May 11th a reference was made on the case of poisoning at Newton in which my name is brought into question, and it is said the woman took the powder in castor oil and was dead in half an hour after. This is quite incorrect, as she had not taken castor oil at all, and it is a question if she had any of the konsso. The powder was ordered to be taken in the usual way, to be followed with a dose of castor oil the following morning.

H. Brunt.

Hyde, May 13th, 1872.

[*** The report of the case was taken from a Manchester paper, but we do not see our correspondent's conduct is at all called in question, since the death was proved by medical and other evidence to have been caused by strychnia.—Ed. Pharm. Journ.]

The Preliminary Examination.

Sir,—In your last issue a correspondent calls himself "One who failed on April 8th." Allow me to state that his proposition, if practised, will be attended with good results. I am not surprised in the least that the Board of Examiners are dissatisfied with the results of the Preliminary examinations when there is too little time allowed to answer the twenty questions asked. Nine minutes per question is not sufficient when there are four translations and a piece of composition included in the questions.

Give us a fair thing and we will be satisfied. What do we want with Drapers' Measurements? as in the 11th question :—"How much cloth do we require for a cloak that has in it four yards of seven quarters wide of lining, the cloth being three quarters wide?" I am not aware that one out of the 21 young men who sat at Manchester answered that question, nor was there any candidate who had answered his questions before the time appointed to give up his papers.

Another who Failed on April the 8th.

A Warning.

Sir,—Permit me through the medium of the Journal to caution the London chemists against a "new dodge" as practised upon me, and I doubt not upon many others in this locality.

On the evening of Sunday, the 21st of April, a very plausible, and decently dressed young man entered my shop, and stated that he had come to London from Liverpool in order to obtain a situation in a London house, but had been quite unsuccessful, and was at that moment homeless and penniless, as his landlord had refused to admit him on account of arrears of rent. Upon my expressing some surprise that amidst the many advertisements in the Journal he had not found one to suit him, he replied that he was invariably objected to on account of his having come from the country. I, however, relieved his immediate necessities, and told him that I would write for him to a gentleman a little way out of town, whom I knew to be in want of an assistant, and if he called on Wednesday I would let him know the result. In answer to my letter, my friend at once telegraphed me to send him down, but as I did not take his address, and had told him not to call until Wednesday, I let the matter rest knowing that my friend would be in town on that day. Wednesday came, and so did my friend, to whom I introduced this very plausible and interesting individual, who at once accepted the situation, and gave us the address of a chemist in Liverpool to whom we were to apply for his character. Pending the reply from Liverpool, my friend took him to show him the way to the railway station, giving him a good meal as they went along. By-and-by back comes my plausible *protégé* saying that he had left my friend at the station, who not having any change had directed him to apply to me for any money he might want previous to his going to his new situation. This I at once refused to do, as my friend had not said anything of the kind to me, but I again gave him something to keep him afloat until the reply should come from Liverpool, and directed him to call again, upon which he left, looking rather dejected. In due time an answer arrived from Liverpool saying that he was utterly unknown to the gentleman to whom he directed us to write, and it is doubtless unnecessary for me to say that he never called again in order to know the result of our application for his reference.

Should this individual attempt anything of the kind upon any of your readers, I hope they will do as I shall do if he ever calls upon me again—show him the door.

James Richardson.

448, *Kingsland Road, May 1st*, 1872.

Dr. George Archbold.—Your letter was not considered fit for publication.

"*Nux Vomica.*"—The provisions of the Pharmacy Act do not apply to the drug in question; but its well-known properties should induce the chemist to caution the person to whom it is supplied, and it would be advisable to register the sale.

A. J. Rivett.—Your question is only susceptible of an answer similar to that which would explain why sugar is sweet.

A. Strachan.—Your letter has been handed to the secretary.

W. C. H.—Inquiries on the point shall be made, and the result communicated to you.

G. C.—Because the quantity of phosphate of lime ordered in Parrish's formula is twice that of the phosphate of iron.

"*Amateur.*"—A suitable work for consultation on the subject would be Dr. Reimann's work on 'Aniline and its Derivatives,' a translation of which, by Mr. Crookes, has been published by Messrs. Longmans.

H. Carr.—(1), Rutaceæ; (2), Canellaceæ; (3), Anacardiaceæ; (4 to 6), Burseraceæ or Amyridaceæ.

J. R. will find several recipes for cements in Beasley's 'Druggists' Receipt Book.'

A. Jones.—You will find the method of preparation described in most works on chemistry.

"*Student.*"—The formula for Parrish's syrup of the phosphates is given in the first volume of the present series, p. 857.

W. S. Bryant.—(1.) Yes. (2.) We are unable to inform you.

J. E. P.—(1.) Yes. (2.) We believe about three hours.

"*A Student*" (London).—You should apply to the Secretary.

"*A Victim who signs himself 'Beware!'*" writes to say that a person is going the round taking in people with an article called "Fire-proof Lustrine."

"*Cecil*" is referred to the rule as to anonymous communications.

Communications, Letters, etc., have been received from Mr. H. Pocklington, Mr. Heald, Mr. Lewin, Mr. Nockold, Mr. E. W. Howe, Mr. W. F. Smith, Mr. J. Davidson, Mr. G. Hindle, "One who would gladly be a Member," Interrogative," "Minor Triumvir," J. B.

SOME EXPERIMENTS ON SULPHITE OF MAGNESIUM.

BY R. H. DAVIES, BELL SCHOLAR.

Some discussion has recently taken place as to the composition and properties of sulphite of magnesium; I have, therefore, at the request of Dr. Tilden, undertaken a few experiments upon the matter.

Sulphurous acid gas, prepared by the action of copper on sulphuric acid, was passed, after being carefully washed, into water holding in suspension some ordinary carbonate of magnesium. The latter rapidly dissolved with effervescence, and the current of sulphurous acid gas was maintained until it appeared to be no longer absorbed, and the crystals first formed had re-dissolved, yielding a clear liquid. This solution was strongly acid to test paper; had a powerful odour of sulphurous acid, and, when shaken in a bottle, gave off that gas freely. A portion of this was submitted to analysis.

(1). 1·4175 grm., largely diluted with well-boiled water, required 56·45 cub. centim. volumetric solution of iodine (containing 1·27 grm. iodine in 100 c.c.)=12·74 per cent. of SO_2.

(2). 2·809 grms. required 112·8 c.c. of the same volumetric solution of iodine=12·85 per cent. of SO_2.

(3). 18·3695 grms., oxidized by means of potassic chlorate and hydrochloric acid, yielded 8·6665 grms. $BaSO_4$, corresponding to

2·3805 grms. SO_2, or 12·95 per cent. SO_2.

(4). 16·875 grms., treated with a strongly acid solution of $BaCl_2$, gave a precipitate weighing ·1412 grm., corresponding to ·230 per cent. SO_2. This existed as sulphate, and must therefore be deducted from the whole number found in the previous experiment. This will leave 12·72 per cent. of SO_2 existing as sulphite, and this result agrees closely with the numbers obtained by volumetric estimation.

(5). 19·539 grms. were evaporated slowly to dryness, and the residue strongly heated. It yielded 3·09 per cent. MgO.

The amount of sulphur found as sulphate would require ·14 of this MgO, leaving 2·95 per cent. combined as sulphite.

If this be combined as acid sulphite (or bisulphite) having the formula $MgH_2 2SO_3$ it will require 9·44 per cent. of SO_2, thus leaving 3·33 per cent. of gas free.

Summary of results.

	1.	2.	3.	4	Mean.
MgO......				2·95	2·95.
SO_2	12·74	12·85	12·72		12.77.

Ratio of MgO to SO_2 found = 1 : 4·32.

,, according to formula $MgH_2 2SO_3$ = 1 : 3·20.

It will be observed that the proportion of SO_2 to MgO is rather greater than would be required, supposing the solution to contain an acid sulphite of the formula $MgH_2 2SO_3$.

A portion of the above solution was slowly evaporated by simple exposure to the air. In this way crystals were deposited in about a week, which were found on examination to consist wholly of sulphate; oxygen had been absorbed from the air.

Another portion of the solution was evaporated at a gentle heat on a water-bath, and the deposited crystals collected, drained, slightly washed, and dried by exposure to the air. Analysed, they yielded as follows:

(1). ·3385 grm. required 31·3 c.c. vol. sol. iodine = 29·59 per cent. SO_2.

(2). ·2415 grm. required 22·5 c.c. vol. sol. iodine = 29·81 per cent. SO_2

(3). ·475 grm. gave on ignition ·089 grm. MgO = 18·73 per cent. MgO.

Summary of results.

	Theory.	1.	2.	3.	Mean.
MgO......	18·86.			18·73.	18·73.
SO_2	30·18	29·59.	29·81.		29·70.

The numbers in column headed "Theory" are those obtained by calculation from the formula of *neutral* sulphite $MgSO_3$ $6H_2O$.

The crystals sent to the museum by Dr. Archbold have precisely the same appearance as those analysed by me, and present the same reactions. They are neutral to test paper.

Dr. Tilden has furnished me with the numbers he obtained in the analysis of this specimen.

(1). ·207 grm. took 19 c.c. vol. sol. iodine =29·37 per cent. SO_2.

(2). ·506 grm. yielded ·096 grm. MgO = 18·97 per cent. MgO.

It appears from the above detailed experiments that the salt noticed by Dr. Archbold in the paper he communicated to the PHARMACEUTICAL JOURNAL a short time ago, is incorrectly described by him as the "Bisulphite of Magnesia," if by this name he wishes to indicate the acid sulphite of magnesium.

The formula of that salt, if procurable in the crystalline form, would be $MgH_2 2SO_3$, and not as he writes it Mg $2SO_3$.

But it has been already pointed out that it is highly improbable that such a compound can exist otherwise than in solution. It might as reasonably be expected that "Fluid Magnesia" would, on evaporation, yield crystals of the hydric or bicarbonate; but, as is well known, the crystals which are frequently met with in fluid magnesia are not bicarbonate, but simply normal carbonate, with three molecules of water of crystallization—$MgCO_3$ $3H_2O$.

In order to test further the possibility of producing crystallized bisulphite of magnesium, I intend to try the effect of exposing a saturated acid solution of magnesium sulphite to a low temperature. It is just possible that this compound, which I have shown cannot be procured according to Dr. Archbold's directions, may be obtained by this modification of the experiment.

EXTRACT OF MEAT.

BY P. MULLER,*

Docteur en Médecine de la Faculté de Paris.

Various concentrated preparations of meat have now for some years been used for the purpose of alimentation, and more particularly by medical men who have prescribed them in cases where the stomach has refused to receive ordinary food, or where they have sought to restore the powers of convalescent patients. The author, however, considers that there is considerable misunderstanding in reference to the properties of these extracts, and in the course of a lengthy memoir, from which we can

* Abstracted from a memoir by the author, published in the *Moniteur Scientifique*, vol. iii. p. 611.

only abstract the chief particulars, he endeavours to show (1) that the extracts of meat have no nutritive value, and (2) that they have a certain action due to the mineral principles—chiefly salts of potash—which they contain.

In the first part of his memoir, after glancing at some of the writings of Liebig and others upon this subject, Dr. Muller disputes an opinion of M. Poggiale, that broths and extracts are nourishing in proportion as they contain nitrogenous principles, and he lays it down as an axiom that their alimentary value depends on the presence of albumenoid matters capable of being transformed in the digestive canal into albuminose or peptose, which he considers to be the only nitrogenous aliment.

The usefulness of the extract of meat as an aliment has long been asserted on account of the nitrogenous compounds that it contains; but the author says that the fact has been lost sight of that this nitrogen is not in a state suitable for assimilation. He points out that the principal nitrogenous products present in extract of meat are creatine and creatinine, both of them crystalline substances.

Creatine ($C_4H_9N_3O_2+H_2O$) is a neutral body, which is changed into creatinine by the action of concentrated acids, through the elimination of water (Liebig).

$$\underbrace{C_4H_9N_3O_2}_{\text{Creatine.}} = \underbrace{C_4H_7N_3O}_{\text{Creatinine.}} + H_2O$$

Boiled for some time in a solution of baryta creatine breaks up into urea and sarcosine:—

$$\underbrace{C_4H_9N_3O_2}_{\text{Creatine.}} + H_2O = \underbrace{CH_4N_2O}_{\text{Urea.}} + \underbrace{C_3H_7NO_2}_{\text{Sarcosine.}}$$

There is also inosic acid ($C_5H_6N_2O_5$), a substance as yet little studied, to which is generally attributed the origin, during the changes which it undergoes in cooking, of the perfume of the meat. It has therefore probably a stimulating action.

With regard to creatine and creatinine, Dr. Muller refers to some experiments of M. Ritter, tending to show that they are not fixed in the system, but are immediately eliminated in the urine. To ascertain whether they might have an action similar to such substances as theine, cafeine, etc., in retarding the waste of tissue, the author undertook a series of dietetic experiments upon himself, using an increasing quantity of extract with both a normal and a vegetable diet; the conclusion to which he came being that they exercise no such power. He is therefore of opinion that the crystallizable nitrogenous principles contained in extract of meat have no nutritive value either directly or indirectly: not directly, since they are identical with the products of dissimilation that are carried off from the system with the excrementitious matter; nor indirectly, since they do not arrest the waste of tissue.

Dr. Muller then proceeds to estimate the value of various preparations by this test. As the result of an examination of several broths, prepared according to the formulæ of MM. Chevreul, Liebig and Beneke, he reports that neither of them contained more than one part of albumenoid matters to the thousand, a proportion which he considers to be of no service for the purpose of nourishment. But while disputing their usefulness according to the commonly accepted notion, he is of opinion that the aromatic principles, salts and condiments which they contain promote the secretion of the gastric juice, and so facilitate digestion. To this property he attributes the origin of the general custom of commencing dinner with soup, quoting the words of Brillat-Savarin, who says, in his *Physiologie du Goût*, that a soup is a light healthy diet, suitable to every person, which comforts the stomach and disposes it to receive and digest food.

Dr. Muller next passes in review some of the extracts of meat most commonly met with in commerce, and enters into considerable detail concerning their preparation and alimentary value.

The first mentioned is M. Reveil's meat jelly, made by boiling down to half its volume, over a moderate fire, and keeping carefully free from scum:

Beef muscle, minced and deprived of fat	500	grams.
Water	1000	„
Salt	3	„
Chloride of potassium	1	„
Carrots, turnips and leeks	30	„

50 grams of gelatine is then dissolved in it at a gentle heat, and it is run into moulds to cool.

M. Reveil claims for this preparation great virtues in restoring the strength of convalescents; but Dr. Muller considers that, being really only a mixture of broth and gelatine, it can yield nothing for assimilation.

In Frankfort, MM. Meyer-Beck and Ripps prepare what they call "Sirupus Extractus Carnis," of which 82 grams should contain the salts of 3 lb. of beef.* M. Hayer has analysed this preparation and says that it has nothing in common with extract of meat but the name, and that the albumen present is due to blood that has been added. He found—

Cane sugar	17·54
Albumen	3·95
Gelatine, phosphates and chlorides	9·49

The author considers that this analysis shows it to possess no nutritive value worth mentioning.

M. Reveil has proposed to replace this syrup by what he calls "Sirop de Musculine," made from—

Muscular part of veal, minced and deprived of fat	100	grams
Water	500	„
Hydrochloric acid	50	centigrams
Chloride of potassium	50	„
Chloride of sodium	50	„

This is macerated with occasional agitation for twelve hours, filtered, a kilogram of sugar dissolved in it at between 35° C. and 40° C., and water sufficient added to make up 500 c. c. of the liquid.

This preparation the author considers to be of scarcely more value than the preceding, M. Ritter having found upon analysis but 0·455 per 1000 of albumenoid matter.

M. Bellat prepares an extract by exhausting meat, chopped fine and free from fat and bone, with cold water until the liquor runs through uncoloured and insipid. The meat is then digested at a temperature of 90° C., with an equal weight of water and a proportion of bones, in vessels closed by strong covers fitted with safety valves, for six hours, during which time it is stirred by an agitator. It is then put in a hydraulic press, and the liquor, mixed with water and previously cooked peas, is added to the solution obtained by the cold operation, clarified by heating sufficiently to coagulate the blood, filtered,

* 'Pharmaceutische Central-Halle,' vol. iii. p. 297.

and the filtrate evaporated *in vacuo* to the consistence of honey. M. Poggiale reports that with 25 grams of this extract and one litre of boiling-water he obtained a savory broth having the flavour of that prepared directly from meat. This extract, however, is not much met with in commerce.

The Australian extract of meat is dismissed rather curtly, and an inferior sample appears to have been examined.

The next preparation referred to is that which is made in accordance with the directions of M. Liebig, by taking meat free from fat and bone, chopped small and steeped in its own weight of water, and raising it slowly to the boiling-point, the coagulated albumen being skimmed off. It is then pressed, and the liquid evaporated over an open fire to one-sixth of its original volume, and afterwards brought, *in vacuo* and at a rather higher temperature, to the consistence of an extract. M. Ritter says that this extract contains a small quantity of albuminose. He found—

Water	12·0
Organic matter	67·4
Inorganic matter	14·6

The organic matter consists of crystallizable principles not yet isolated and studied.

M. Hepp, principal pharmacien to the Strasburg hospitals, prepares an extract of meat by a modification of Liebig's process. The evaporation is not carried so far, and a fine jelly is produced which is flavoured with aromatic herbs. Upon analysis M. Ritter found—

Water	85·27
Organic matter	11·25
Inorganic matter.	3·48

This preparation, which contains 2·20 per cent. of albumenoid matter, and is taken without the least repugnance, the author considers to be superior to any of the preceding; but it is under the disadvantage of becoming quickly covered with mould, arising from the fermentation of the vegetable matter present.

In concluding this part of his subject, Dr. Müller refers to a statement by Baron Liebig, that one pound of his extract, with a sufficient quantity of potatoes and bread, would make an excellent broth for 128 soldiers. This the author disputes, saying that, though it would make a broth, the nourishment would not be so great as though the soldiers had the thirty-two pounds of meat that the pound of extract would represent. If extract of meat has any alimentation, he considers it to be due to the salts which constitute one-fifth of its weight. Of 100 parts of these salts, Baron Liebig says that 81 are soluble in water, and 19 insoluble, of which 5·77 is phosphate of lime, and 13·23 phosphate of magnesia. The extract may be beneficial at the termination of a long illness, since the saline matters principally necessary in the formation of the gastric juice are so furnished to the exhausted system. But as these are principally salts of potash, the extract will produce in the system the characteristic effects of those salts: in small quantity it is stimulant; but strong doses should be avoided, for then the salts of potash impede hematosis. M. Hepp found that the extract previously described as prepared by him was insufficient to support life in dogs,—one dying at the end of fifteen days, and one at twenty, and similar results were obtained by the author. But M. Kemmerich* has met with results that seem to point to direct toxic effects from the use of extract of meat alone. Two dogs were supplied by him, one with water only, the other with water containing five grams of extract, daily. At the end of ten days the latter, which had been the stronger dog of the two, could not walk, and on the twelfth day it died, after which time the former was restored to its normal food and recovered. During this time two other dogs were kept in good health by being fed upon the meat residue from which the extract had been prepared, seasoned with common salt. On another occasion death followed the injection into the stomach of a rabbit weighing one kilogram of the extract obtained from its own weight of meat. Dr. Muller does not, however, think that this toxic action is due to the organic crystalline principles contained in the extract, since a considerable quantity of creatinine has been injected into the blood of rabbits without any injurious effect; but that it is due to the mineral crystallizable principles—principally salts of potash,—M. Kemmerich having shown that the ash only will cause death.

The third and concluding part of the memoir deals with the physiological action of the salts of potash. It records an elaborate series of experiments as to the relative action of the alkaline salts upon the blood globule. It was found that the salts of soda retarded the decomposition of the blood globule longer than those of potash and ammonia, and that they also retained a larger proportion of oxygen. In the presence of potash salts, it was found that the globule absorbed less oxygen, and the serum less carbonic acid. The author is, therefore, of opinion that too large a quantity of extract of meat, administered at the close of a long illness, when the system is exhausted by a long abstinence, would be injurious in proportion, as the organism has lost its chloride of sodium, and that the medical man should be aware that to give these extracts alone is but to prolong the feebleness of his patient.

* 'Wiener medizinische Wochenschrift, 1869.

VESICATING INSECTS.

BY M. C. COOKE, M.A.

(*Concluded from page 947.*)

XII. Adulterants.

This series of papers would scarcely be complete without an enumeration of those insects which from time to time have been found mixed up chiefly with the commercial Cantharides, as an adulteration, not possessing in themselves any vesicating properties. In all these cases it may fairly be presumed that the mixture was compounded with a fraudulent intention.

The largest and most attractive of these insects is the Green Musk Beetle, *Aromia moschata*, L., the *Callichroma muscata* of Moquin-Tandon, and *Callichrôme musqué* of Guibourt, figured in Curtis's 'British Entomology,' plate 738. It is one of the *Longicornes*, from 1 inch to upwards of 1½ inches in length. The following is its technical description:—Shining green, coppery, or bluish; glabrous; head slightly punctured; thorax irregularly tuberculated; elytra thickly roughened, especially at the base; with three faint varied hairs; legs and antennæ bluish. It is found on willows, being a common European species, and not uncommon in Britain. When employed as an adulterant, of course the long horns are broken off, and, indeed the elytra are the chief parts used, which it need scarce to be said contain no vesicatory properties.

Moquin-Tandon mentions also the common Rose Chafer, *Cetonia aurea*, L., the *Cétoine dorée* of Guibourt, as one of the insects which are mixed with the Cantharides for the purpose of fraud. It is abundant on flowers in many parts of Britain, and is thus described:—Shining golden green or deep black; beneath, bright copper; head and thorax punctured; scutellum smooth; elytra irregularly punctured, the suture and three lines faintly elevated, the apical portion with several waved whitish scales and spots; sternum with its tip somewhat globose. When fraudulently employed it is also broken up, or the very different shape would instantly be recognized. In colour it very nearly assimilates to that of the 'Spanish Fly,' or Cantharides of commerce.

The species of *Chrysomela* alluded to by Moquin-Tandon is probably the same as that exhibited in the Museum of the Pharmaceutical Society, and which is a plump little green beetle, picked out in some quantity from a sample of Cantharides which was imported into London. This is the *Chrysomela graminis*, L., figured by Donovan in his 'British Insects,' plate 365, fig. 1. Oblong-ovate, convex, shining blue-green; head and thorax thickly punctured; elytra thickly and finely punctured, punctures distinct and irregularly placed in lines towards the sides, surface of a uniform blue-green; legs and antennæ brassy green. Found in grassy places in many parts of Britain. It is not improbable that *Chrysomela fulgida*, Fab., is sometimes mixed with it.

The remaining species cited by Guibourt are *Diphucéphale soyeux*, figured in the Atlas to the 'Règne Animal' of Cuvier, plate 43, fig. 3; the *Mélyre vert* or *Melyris viridis*, Fab., figured in the same work, plate 32, fig. 18; and *L'Euchlore de la vigne*, or green vine beetle, *Bromius vitis*, also figured in the Atlas cited, plate 43, fig. 7. All these green beetles, and probably others of the same colour, have been broken up and mixed with the officinal Cantharides. It is easy for an entomologist to detect these fraudulent mixtures even from the fragments into which they are broken, especially by the use of the microscope. None of them possess vesicating properties in the smallest degree, and it is believed that the readiness with which such adulterations can be detected, is one of the chief reasons why the fraudulent adulteration of Cantharides is not practised to any important extent; in fact, it seems difficult now-a-days to meet with a sample of the adulterated drug.

THE USE OF PETROLEUM-BENZINE* IN MAKING OLEO-RESINS.

BY JOHN M. MAISCH.*

Petroleum benzine is an excellent solvent, and has been repeatedly suggested for introduction into the pharmaceutical laboratory, particularly when, in consequence of the high tax upon alcohol, the price of ether and the other derivatives thereof was even higher than at present. It is not unlikely that the so-called benzine may have been substituted wholly or in part for ether before experiments on this subject were published.

In 1866 Professor Procter* proved that cubebs, after having being exhausted by the solvent in question, yielded to ether over 4 per cent. of cubebin, waxy matter, chlorophyll, with a little pungent resin. Mr. H. N. Rittenhouse† therefore suggested to prepare oleo-resins by employing first ether, and finish the percolation with petroleum benzine. In 1867 an interesting discussion on this subject took place at the meeting of the American Pharmaceutical Association,‡ but the facts at that time published were very few in number.

At the close of the last session of the Philadelphia College of Pharmacy two essays were presented, both treating of this question from a different standpoint, without, however, exhausting it. Notwithstanding this, the results are sufficiently interesting to deserve notice. Mr. Alfred H. Bolton treated powdered capsicum, cubebs and ginger with petroleum benzine, spec. grav. 700, and exhausted them by the process of repercolation, whereby the powders were left entirely or almost tasteless; three troy ounces of the powders named yielded respectively six, four, and one fluid drachms of oleo-resins.

Mr. Milton W. Roth operated on ginger and cubebs, and observed that these substances, when exhausted by petroleum benzine, spec. grav. 686 to 710, would again yield to ether some non-volatile matter, which it is to be regretted was not sufficiently examined; the benzine oleo-resins of both drugs were perfectly soluble in ether, but the ethereal oleo-resins yielded precipitates on being mixed with benzine. It follows conclusively from these experiments, what Prof. Procter (loc. cit.) proved in 1866 for cubebs, that the benzine oleo-resins are not *identical* with the officinal ethereal oleo-resins, while Mr. Bolton, from the tastelessness of the residuary powder, argues or rather is inclined to regard the two products as representing the drugs in question.

The absence or presence of odour and taste, however, are too unsafe criteria of the medicinal properties, since some decidedly active principles, like santonin, the resins of jalap and scammony, etc., are tasteless or nearly so, while the experiments of Dr. Bernatzik,§ Mr. F. V. Heydenreich,|| and of E. A. Schmidt,** prove that the volatile oil of cubebs has no diuretic properties whatever, but acts as a carminative, diffusive stimulant and irritant, like most other volatile oils.

Petroleum benzine is such an excellent solvent, and at the same time so low in price, that its employment in the place of ether and even alcohol is very desirable; but from all the knowledge we possess thus far, based upon critical experiments, the substitution of the liquids in question for pharmaceutical preparations must be regarded as inadmissible until it has been proven that the proximate principles not acted upon by the benzine are medicinally inert; odour and taste alone are insufficient to furnish this proof.—*Amer. Journ. of Pharm.*

* The application of the term benzine to this volatile spirit is objectionable, inasmuch as it is liable to cause misunderstanding. It is the more volatile portion of petroleum or paraffin oil, and would be better designated petroleum or paraffin naphtha.—ED. PHARM. JOURNAL.

† Read at the Meeting of the Philadelphia College of Pharmacy, April 16th, 1871.

* 'American Journal of Pharmacy,' 1866, 210.

† Proceedings of the American Pharmaceutical Association, 1866, p. 208.

‡ Proceedings, 1867, page 94.

§ Amer. Jour. Med. Sc., cvii. 534. Proc. Amer. Pharm. Assoc., 1868, 194.

|| Proc. Am. Pharm. Assoc., 1867, 337. Amer. Journ. Pharm., 1868, 42.

** Amer. Journ. Pharm., 1870, 222.

REMARKS ON PLANTS FURNISHING VARIETIES OF IPECACUAN, AND ON THE CULTIVATION OF CEPHAELIS IPECACUANHA (RICH.) IN THE ROYAL BOTANIC GARDEN OF EDINBURGH.

BY PROFESSOR BALFOUR.*

(*Concluded from page* 949.)

The people who gather the Poaya (Ipecacuan) are called *Poyaeros*. When gathering the plants, the Poayero seizes several stems with one hand, while with the other he pushes into the ground obliquely a sharp-pointed stick called *saracoa*, by means of which he raises up the roots. He then pulls up the plants with their loosened roots. The Poayero then separates the roots, removes the adhering earth from them, and puts them in a bag which he carries suspended at his side. A skilled collector can pull up, in the course of a day 15 kilogrammes (about 30 lb.) of Ipecacuan. In general, however, the quantity collected in a day does not amount to more than from 3 to 5 kilos, *i.e.*, 6 to 10 lb.

The Poayero gives the roots to a superintendent, who weighs them, and lays them out to dry. The more rapid the drying so much the better. Hence, the process is best carried on in full sunshine. In favourable weather the roots are dried in the course of two or three days. The process goes on more rapidly when the roots are protected from the night dew. When properly dried, the roots break easily with a resinoid fracture. The gathering of the Ipecacuan goes on during the year, but in general it is intermitted during the rainy season.

The flowering of the plant takes place in the months of February and March. The plants by being pulled up are often prevented from producing seed; they, however, propagate readily by buds from the creeping rhizome. The parts of the roots from which the buds spring are shown in the plate illustrating Mr. M'Nab's paper (Trans. Bot. Soc. vol. x. plate iv.)

When the Poayero pulls up the roots, he breaks them at certain points, and from these ruptured parts young plants proceed, and thus the total destruction of the plant is prevented. In Matto Grosso, Weddell says that the Poayeros take some pains to protect the part of the roots left in the soil, and fill up the holes when the plants have been pulled. In this way it is probable that in the course of three to four years the ground which has been robbed of plants may recover itself.

Dr. Gunning, however, in writing to Dr. Christison, from Rio Janeiro, says, that in that district, the plant is extensively destroyed by the operations of the Ipecacuan gatherer, and that in the course of time it becomes scarce, and altogether disappears in the searched localities. Hence the necessity for planting Ipecacuan in places where it can be protected, the collection of the roots being put under proper superintendence.

Weddell thinks that the burning of the forests in Brazil rather tends to propagate the plant. Before burning, the soil is encumbered with a great amount of vegetable débris, which accumulates to such an extent as to prevent the seed of the Ipecacuan from falling into congenial soil, and to choke any plants which may be in a growing state. The burning of the forests acts in removing this débris.

When the roots are properly dried, they are broken into small fragments. From 1835-37, Weddell says that in the neighbourhood of Villa Maria (in Upper Paraguay) 150,000 kilos. of Ipecacuan were gathered, and there were from 1200 to 1500 collectors in the forests. Men, women, children, free people, and slaves, went into the depths of the Paraguayan forests, and spent some months in collecting the roots. At that time, the price of 14½ kilos was 50 to 60 francs at Villa Maria, and 78 to 90 at Rio Janeiro. This state of matters, however, soon ceased, and the Poayeros took to the usual plan of collecting.

The first figures of Ipecacuan were given by Piso and by Marcgrave, but evidently from the same drawing. It was not, however, such as to enable botanists to determine the plant.

Ray believed that Ipecacuan was furnished by a species of *Paris*; Morison, Plukenet, and Linnæus referred it to *Lonicera*. At that time, all annular emetic roots were called Ipecacuan. The drug of commerce was heterogeneous, and was supplied from various sources. The specimens were long distinguished by the colour; and we had brown, grey, black, and white Ipecacuan. In 1764, Mutis, Director of the Botanical Expedition to Santa Fé de Bogota, in New Granada, sent to Linnæus specimens of the plant which furnish the Ipecacuan root of that country. In 1781, Linnæus the younger described the plant under the name of *Psychotria emetica*. In 1800, Bernardo Gomez, a Portuguese, gave an accurate scientific description of the Ipecacuan plant; and on the 3rd of February, 1801, his countryman, Felix Avellat Brotero, Professor of Botany in the University of Coimbra, republished his description, without acknowledgment, in the Transactions of the Linnean Society (vol. vi. p. 137), and called the plant *Callicocca Ipecacuanha*. The genus was described as having an ascending, somewhat shrubby, creeping stem, with ovate-lanceolate leaves, somewhat pubescent on the lower surface, a terminal pedunculate capitulum of flowers, a four-leaved involucre, with subcordate leaflets, and a 5-cleft corolla. He considered this the plant of Piso, and gave a full description of it, with an excellent figure. It was found in Pernambuco, Bahia, Rio Janeiro, San Paulo, Marian, and other parts of Brazil. Achille Richard agreed with Brotero in regard to the plant which yielded the true annulated Ipecacuan. It was, however, referred by him to the genus *Cephaelis* of Swartz, as given in his 'Prodromus Floræ Indiæ Occidentalis.' The plant is placed in the Natural Order *Rubiaceæ*, Suborder *Cinchoneæ*, or, according to Lindley, the Order *Cinchonaceæ*.

The following are some of the genera of the *Cinchonaceæ* which contain plants used as Ipecacuan:—

A. Fruit with 1-4 seeded loculaments.
Cephaelis, *Psychotria*, *Richardsonia*, *Borreria*.

B. Fruit with many-seeded loculaments.
Manettia.

Besides these, we also find plants known by the name Ipecacuanha in other Natural Orders, as already mentioned.

Let us notice some of these plants.

Cephaelis.—Calyx-tube obovate, limb very short, 5-toothed; corolla somewhat funnel-shaped, with five small, rather obtuse lobes; anthers included. Style usually long,* with an exserted bifid stigma. Berry obovate-oblong, crowned with the remains of the calyx, bilocular, two-seeded. Shrubs or herbs, with oval, acute, petiolate leaves; stipules, 2-toothed and partite. Capitula terminal or axillary, with 2–8 bracts.

C. Ipecacuanha.—Stem ascending and afterwards erect, somewhat pubescent at the apex, leaves oblong-ovate, rough above, with slender pubescence below, stipules cleft in a setaceous manner. Capitula terminal, stalked, erect, and afterwards pendulous. Root creeping, annulate, brown or grey in colour. It is known as Ipecacuan in Europe, and as one of the Poayas in Brazil—annulated Brazilian or Lisbon Ipecacuan of commerce.

One character is omitted in the description, viz., the clusters of oblong, somewhat ovate glands, which are found on the inside of the stipules at their base. There are stomata and hairs on the epidermis. The stomata are deeply situated, and are surrounded by a series of epi-

* Read before the Botanical Society of Edinburgh, May 11th, 1871

* Martius says style equals length of corolla tube in *Cephaelis*.

dermal cells. The hairs are conical, and arise from a series of 5-7 cells at the base. They are often partitioned. The section of the aerial stem shows a cortical, fibrous, and medullary portion. The epidermis consists of condensed cells. Below it are cells more or less hexagonal. Then we come to the vascular circle, consisting of spiral and pitted vessels, and fusiform tubes of wood. In the centre are the hexagonal cells of pith.

The true Ipecacuan of commerce is an annulated root, occurring in pieces three to four inches long, and about the size of a small writing quill, variously bent. The rings constitute the cortical portion of the root. They can be easily separated from the central portion, and pulled off in a ring-like shape. In many pharmaceutical specimens the hard central part is seen between some of the rings. They appear like a row of rings strung on a fibrous hread; hence the name ringed or annulated.

The root has a resinous fracture. The outer portion is of a dark brown or grey colour. The epidermal portion consists of compact cells. Below these are hexagonal cells, full of starch grains of various forms—round, oval, and angular, with a distinct hilum, which is round, or angular, or elliptical. Near the hilum there is a dark shading, which seems to indicate striation. Neither Mr. Sadler nor myself have been able to detect true striæ on them, even under a Ross microscope magnifying 870 diameters. In some of the cells, the starch grains are crowded together so as to fill the whole cavity.

The inner part of the cortex consists of more delicate and more transparent cells without starch, or, at least, with a small number of grains. Then comes the central part, called by pharmaceutists the meditullium. It is of a fibrous nature, and consists of pleurenchyma and pitted vessels without any spirals. These vessels are arranged in wedge-shaped clusters, radiating from the centre. In some of the tubes of the wood starch-grains are found in large quantity. There is no true pith. From the meditullium extend spur-like processes, which are rudimentary buds. When the root is cut into pieces, these projecting portions constitute the nodes whence buds proceed. It is by means of them that plants have been propagated.

The cortical part of the root contains the active principle called emetine or emetia, which was discovered by Pelletier and Magendie in 1817. It is a white, slightly bitter substance, is insoluble in water, or ether, but is soluble in alcohol and dilute acids, as well as in chloroform. In the dose of one-sixteenth of a grain it acts as a violent emetic. Two grains of emetine will kill a dog.

One of the plants early used as Ipecacuan, and figured as such, under the name of striated, black, or Peruvian Ipecacuan, is *Psychotria emetica*. It differs chiefly from Cephaelis in the want of the common involucre, and in the flowers being stalked so as to form a sort of fascicle or corymb.

Psychotria, L. — Calyx gamosepalous, 5-toothed; corolla funnel-shaped, 5-cleft; 5 stamens, anthers exserted or included; style bifid; drupe with two seeds, calyx limb attached to the fruit.

P. emetica, Mutis (*Cephaelis emetica*, of Persoon).—Shrubby, erect, oblong-acuminate leaves, ciliated; stipules short, ovate, acuminate; fruit succulent, somewhat globose, of a blue colour. It is found in New Granada, and on the banks of the Magdalena river.

The roots of the plant are perpendicular and knotted, not closely annulated, like the Ipecacuan, and they are distinctly striated. They have a slender axis or meditullium, and a thick friable cortical portion. They yield nine per cent. of emetine. The stem of the plant has a remarkable septate or discoid pith, similar to what occurs in some Euphorbias, as well as in the walnut and jessamine.

Another plant supplies the white or amylaceous Ipecacuan (Poaya do Campo) found in Brazil, New Granada, Peru, and Vera Cruz. It belongs also to *Cinchonaceæ*, the Tribe *Spermacocidæ*, and Genus *Richardsonia*.

Richardsonia, Kunth; *Richardia*, L. — Calyx subglobose, 4-7-partite, corolla funnel-shaped, 3-5-lobed, stamens 3-5, exserted; fruit, 3-4, dry, one-seeded cocci, forming a sort of capsule with the calyx limb on the top.

Richardsonia scabra, St. Hilaire (*R. brasiliensis*, Virey).—Stem with rough hairs; leaves ovate, or ovate-lanceolate, with rough margins; the setæ of the stipules shorter than the sheath; heads many flowered; triangular lobes of calyx ciliated; segments of corolla hairy at the apex. The fracture of the root is not resinous, but farinaceous, of a dull white colour. There is an abundance of starch in the cells. The root contains about six per cent. of emetine. Martius says that it is used as an emetic, in doses of ʒj to ʒij.

In the same section of *Cinchonaceæ* occur species of *Borreria*, which are used like Ipecacuan.

Borreria ferruginea, DC. (*Spermacoce ferruginea*, St. Hilaire); *Borreria Poaya*, DC. (*Spermacoce Poaya*, var. *a*, St. Hilaire).

Another of the emetic roots in Brazil is the produce of a small fine-flowered twiner belonging to the *Cinchonaceæ*, called *Manettia cordifolia*. The genus was named after Xavier Manetti, Professor of Botany in Florence, who published, in 1751, a work on Italian fruit trees.

Manettia, Mut.—Limb of calyx 4-5 lobed, often with secondary ones; corolla funnel-shaped, 4-5 lobed limb; anthers sessile, in throat of corolla; capsule ovate crowned with calyx lobes; peltate seeds.—*M. cordifolia*, Mart. (Bot. Reg., t. 1866). Native of Brazil, banks of the Arroyo de la China, a stream which enters the Uruguay, Entre Rios; hedges in the province of Minas-Geraes, near Villa Rica. Bark of root esteemed in Brazil as a valuable remedy in dysentery; dose, ʒss to ʒjss. It is also used as an emetic.

We now come to another Natural Order, which furnishes plants having the properties of Ipecacuan, viz., the Order *Violaceæ*. Emetic properties are found in the roots of some of the common violets, such as *V. canina* and *V. sylvatica*; but it is especially in the genus *Ionidium* (ἴον a violet, and ἴδιον peculiar) that properties like those of the real Ipecacuan occur.

Ionidium, Vent.—Sepals 5, not prolonged at the base; corolla unequal, 2-lipped, 5 petals, lowest very large with a spur; 5 stamens unequal, 2 anterior with appendiculate anthers; sepals, petals, and stamens remain covering the capsule.

I. Ipecacuanha, Aug. St. Hil. (*Viola Itubu*, Aubl.; *Ionidium Itubu*, H.B.K.; *Pombalia Itubu*, DC.), woods of Brazil, where it is called *Poaya branca* and *Poaya de Praga*. — Leaves alternate, lanceolate-ovate; stipules ovate-lanceolate, acute; lower petals very large; root emetic.

Several other Ionidiums possess emetic properties, as—

Ionidium Poaya, Aug. St. Hil., Minas-Geraes, in Brazil; called Poaya do Campo. *I. microphyllum*, H.B.K., Curichunchulli, 'Companion to the Botanical Magazine,' i. 278. Quito, near foot of Chimborazo; specially used in elephantiasis tuberculata. *I. parviflorum*, Vent., Tr. Mad. Bot. Soc. i. 206. *I. brevicaule*, Mart.; *I. urticæfolium*, Mart. These are all Brazilian species.

The Natural Order *Polygalaceæ* supplies a plant which is called a Poaya or Ipecacuan, viz., *Polygala Poaya*, Spix and Martius. The root is perennial, perpendicular, or slightly oblique, 3-5 inches long, and the size of a writing quill at the top, attenuated downwards and towards the base, divided into spreading branches, twisted in a vermicular manner, contracted at different parts, and marked by cicatrices; the epidermis pale ochre colour, sometimes transversely striated, with a pale spongy cortical portion; at first having a sweetish taste, but afterwards becoming bitter, and a central ligneous white thread, thicker than the bark. On mountain plains of San Paulo and Minas.

One of the *Asclepiadaceæ* yields a kind of Ipecacuan, *Tylophora asthmatica*, W. and A.; (*Cynanchum Ipecacuanha*, Willd.; *Asclepias asthmatica*, Roxb. Fl. Ind.; *Cynanchum vomitorium*, Lam.). It is an East Indian twiner, common in sandy places.

The leaves and roots are an efficacious substitute for Ipecacuan. Dr. Roxburgh used it in dysentery, and Dr. J. Anderson, of Madras, employed it in that disease with great success. It is recommended as a valuable remedy also in asthma, and has been admitted into the Pharmacopœia of India (1869), where the uses are described, pp. 142 and 458. Four other East Indian plants of this Order have been employed for their emetic properties.

Another Order which supplies a plant known as an Ipecacuan is the *Euphorbiaceæ*. In this we meet with *Euphorbia Ipecacuanha*, L., a plant which grows in sandy soils in the middle and northern states of North America. It has an irregular fleshy root, very large in proportion to the plant, running into the sand, sometimes to the depth of six feet. From its stem proceed numerous dichotomous branches on the surface of the ground. The flowers are produced on long peduncles from the forkings of the stem. The root acts as an emetic; it is also cathartic, as might be expected from the character of the Order to which the plant belongs.

OLEATES OF MERCURY AND MORPHIA.

In a Clinical Lecture recently delivered by Professor John Marshall, F.R.S., in the University College Hospital,* he drew attention to the fact that mercurial ointment, which is itself the basis of other mercurial preparations, is merely a mechanical mixture of minute globules of mercury; and said that he had long thought that if a solution of mercury in some oleaginous or unctuous medium could be employed, more immediate and satisfactory results would be obtained from the well-known therapeutical powers of this ancient remedy. In seeking for his object he first dissolved some of the perchloride of mercury in a small quantity of ether, and added to it about four times the amount of oleic acid; but found that this combination freely used on the skin produced much irritation, unless it was employed in too dilute a form to be of service as an absorbent. In Gmelin's Chemistry there is a short account of certain metallic oleates formed by double decomposition; but with this as a guide, he failed to obtain any satisfactory oleate of mercury. Mr. Frank Clowes, to whom he then referred the chemical question, soon discovered that, although the ordinary sublimed scales of red oxide of mercury were with difficulty dissolved in oleic acid, the oxide, precipitated by caustic potash or soda from a solution of the metal in nitric acid (which is a yellow impalpable powder) is, when recently made and well dried, readily soluble in oleic acid, especially when aided by a temperature of about 300° F. At Professor Marshall's request Messrs. Hopkin and Williams have since studied the subject pharmaceutically, and have succeeded in preparing oleate of mercury, and certain solutions of that salt in oleic acid. The strength of the preparations made by them is indicated by the percentage of the oxide of mercury which they contain. The 5 per cent. solution is a perfectly clear pale yellow liquid, resembling olive oil, but thinner; the 10 per cent. solution is also fluid and perfectly clear, but as dark as linseed oil; whilst the 20 per cent. preparation is an opaque yellowish unctuous substance, closely resembling in appearance resin ointment, melting very readily at the temperature of the body, and forming a kind of transparent, viscid, colourless varnish when applied to the skin. The chief care to be observed in the manufacture of these solutions is not to hurry the process, and not to employ a high temperature, or the mercury will be immediately reduced.

Unlike the mercurial ointment so long in vogue, which is a crude, gross, unscientific mixture, very dirty and very wasteful, because so small a proportion of its mechanically admixed mercury is but slowly absorbed, these solutions of oleate of mercury are cleanly and economical in use; and as the diffusibility or penetrating powder of oleic acid is much greater than that of ordinary oils or fats, and as each one-thousandth part of even a minim of these new preparations contains its proper modicum of mercury, they are absorbed by the skin with remarkable facility and manifest their remedial effects with great promptitude. They should not be rubbed in like ordinary liniments or embrocations, but should be *merely applied with a brush, or be spread lightly over the part with one finger*; otherwise they may cause cutaneous irritation, or even produce a few pustules on the skin, especially in certain persons. This result may, however, be obviated by the addition of a small quantity of olive oil, or purified lard, according as an oleaginous or an unctuous preparation is required. Any of these forms may be scented by the addition of essential oils.

In employing these mercurial solutions for combating persistent inflammation of joints, Professor Marshall soon found that the addition of morphia was of very great advantage. For this purpose the simple alkaloid must be used, as neither the hydrochlorate, the acetate, nor the meconate is soluble in oleic acid. For every drachm of the solution of oleate of mercury in oleic acid one grain of morphia may be added. Being, as well as the mercury, completely dissolved, it quite as rapidly penetrates the skin, comes quickly into contact with the extremities of the nerves, and thus, even within a few minutes, acts upon them at their most sensitive points, and speedily produces a soothing effect.

The oleates of mercury and morphia, thus united in one preparation, represent, as it were, a liniment, ointment, or plaster of mercury and opium; but they are far more elegant, economical and efficacious.

* Reported in the *Lancet*, May 25th, 1872.

ELIXIRS AND WINES.*

BY C. LEWIS DIEHL.

At the request of the committee on unofficinal formulæ, I present in the following the formulas used by me for preparing some of the elixirs and wines prescribed by the physicians of Louisville. Many of these have been used by me for several years, as the elixirs of Calisaya, etc., and have been found to be good preparations. Others have only lately been prepared by me, but seem to be desirable preparations, if this class of preparations is at all desirable or necessary. It is not my intention or desire to criticize the propriety of introducing these preparations; but that a necessity exists for formulas which will secure uniformity in their preparation seems to me beyond question. Our markets are flooded with numberless preparations of this kind. Physicians prescribe them, and usually signify the manufacturer whose particular preparation they prefer. As a result of this we are either compelled to keep all of these preparations in stock, or to depend upon the courtesy of our fellow-pharmaceutists when they are prescribed. If we attempt to keep them in stock a considerable outlay of capital is required, with in but isolated instances more than a very meagre chance for a fair return. To depend upon our neighbour for the occasional calls is unfair to him, as it in a measure compels him to carry the stock upon which we may reap profit. But in every way it is unfair to the patient, who is often caused to pay exorbitant prices —even when such price is only a fair advance upon the

* Read before the Louisville College of Pharmacy, January 16th, 1872.

cost—for preparations that, if prepared by the pharmaceutist, would not exceed the cost of ordinary tinctures.

I have attempted to simplify formulas as much as possible, in order that such as are but seldom demanded may be prepared as wanted. With this in view I prepared a simple elixir, an elixir of Calisaya bark, a wine flavoured with orange, various solutions of essential oils in alcohol, and cochineal colouring; of which I usually keep in stock, and prepare by their aid, such preparations as may happen to be in demand.

ELIXIR OF CALISAYA BARK.

Take of Calisaya bark	℥xxiv.
Curaçao orange-peel (ribbons)	℥xvi.
Coriander	℥iv.
Cardamom	℥iss.
Cinnamon (Ceylon)	℥iij.
Anise	℥j.
Cocoa (Baker's)	℥viij.

Reduce to a moderately fine powder; displace with a mixture consisting of one part by measure of stronger alcohol and three parts of water; obtained two and a half gallons of percolate.

Meanwhile prepare from six pints of solution of tersulph. of iron, hydrated sesquioxide of iron by the formula of the Pharmacopœia, measure it, and add to every four measures one measure of alcohol; then add of this sufficient to the percolate obtained as above to deprive it of its cincho-tannic acid. The absence of the latter is readily ascertained by the addition of a drop of muriated tincture of iron to a filtered portion of the liquid in operation, which should not be coloured by such addition. Should colouration result, the intensity or faintness will serve as a guide to the further quantity of hydrate sesquioxide of iron necessary to completely detannate the preparation. As soon as this result is obtained, strain the mixture upon a muslin strainer; and, when the liquid ceases to pass, wash the residue upon the strainer, with sufficient of a mixture of one measure of stronger alcohol to three of water to make the strained liquid measure five gallons. Now triturate together oil of orange (fresh), f℥ss. (or solution, f℥v.; see further on); carbonate of magnesia, ℥vj. When thoroughly mixed, incorporate it with the strained liquid obtained as above, agitate well, and filter through paper; express the filter between muslin, filter the expressed liquid, and mix with the previous filtrate, in which dissolve 15 lb. av. of sugar. If necessary, filter the elixir thus obtained; but simple straining will usually answer.

SIMPLE ELIXIR.

Take Oil of orange (fresh)	f℥j	(or sol. f℥x).
Oil of cinnamon	♏x	,, ♏c.
Oil of anise	♏iv	,, ♏xl.
Oil of bitter almonds	♏ij	,, ♏xx.
Tinct. of cardamom.	f℥x	
Stronger alcohol	℈ij	

Dissolve the oils in the alcohol, add the tincture, and triturate the solution with a previously-powdered mixture of cocoa (Baker's), ℥j.; carb. magnesia, ℥ij. Then add gradually four and a half pints of water, transfer the mixture to a one-gallon bottle, agitate occasionally for several hours, and filter; express the filter between muslin, filter the expressed liquid, mix the previous filtrate, and dissolve in it 3lb. av. of sugar; filter or strain as may be necessary.

The simple elixir thus prepared has the colour of dark Madeira wine, and an exceedingly pleasant taste. It serves as a vehicle for many medicines, disguising them to a great extent and rendering them generally more palatable.

WINE OF ORANGE.

Take Oil of orange (fresh)	♏v (or sol. ♏l.)
Alcohol	f℥ss
Carb. magnes	℥ss

Triturate together, and add syrup, f℥ij.; sherry wine, f℥xiij. ss.; mix thoroughly and filter.

The wine obtained in this way has an agreeable flavour of orange. The use of carbonate of magnesia renders it neutral, and thus enables the introduction of medicinal compounds that are liable to decomposition in the presence of acids.

SOLUTION OF ESSENTIAL OILS.

I have been in the habit of dissolving essential oils that are liable to change in alcohol, and have found these solutions very convenient for measuring minute quantities of oils. They are prepared by dissolving essential oil, one part (by measure), in alcohol fort., nine parts; which strength is invariably meant when, in the formulas, I direct the use of solutions of essential oils.

COCHINEAL COLOUR.

Take of Cochineal	℥j.
Carb. potassa	℥ss.
Powd. alum	℥ss.
Cream of tartar	℥j.
Water	℥viij.

Reduce the cochineal to a fine powder, add the carbonate of potassa, and triturate with three ounces of the water. Allow the mixture to stand one hour, add the alum and cream of tartar successively, and, when effervescence has ceased, the remaining water; filter. This solution imparts to the elixirs a fine red colour; but is in some respects unsatisfactory, as it soon spoils.

The above are all the preparations that need to be kept in stock; and with them, and such other ingredients as are readily obtained by purchase, almost all the elixirs and wines now prescribed may be prepared extemporaneously. The exceptions to these are:—

COMPOUND ELIXIR OF TARAXACUM,

which being used for the purpose of disguising the extreme bitterness of quinia, should be prepared according to the original formula of Mr. Candidus, as communicated by him to the American Pharmaceutical Association.

ELIXIR OF PYROPHOSPHATE OF IRON, QUINIA, AND STRYCHNIA

requires particular manipulation, which precludes the use of simple elixir. The following formula—the result of concert of experiments of my friend Mr. E. Scheffer and myself—has been used by me since autumn, 1869, and I can recommend it as uniformly successful when the manipulation is carefully conducted:—

Take Sulphate of quinia	60 gr.
Strychnia	1 gr.
Citric acid	5 gr.
Stronger alcohol	f℥ij.
Solution of oil of orange	♏l.
Syrup	f℥vj.
Pyrophosphate of iron	℥ss.
Distilled water	f℥vij.
Aqua ammonia	q. s.

Triturate the sulphate of quinia, strychnia and citric acid together until minutely divided, then add the alcohol and solution of oil of orange. Warm the syrup slightly (to about 150° F.), and add to the turbid alcoholic mixture; when, upon stirring, the mixture becomes clear. To this add the pyrophosphate of iron, previously dissolved in the distilled water, and finally aqua ammonia carefully (drop by drop), until the elixir is perfectly neutral to test paper; filter.

The finished preparation has a greenish yellow colour, a pleasant flavour of orange, and is permanent.

ELIXIR OF CALISAYA BARK WITH IRON.

Take of pyrophosphate of iron 128 grains, soften in f℥ij. of water, and stir in gradually 1 pint of Elixir of Calisaya Bark; filter.

ELIXIR OF CALISAYA BARK WITH IRON AND STRYCHNIA.

Dissolve 1 grain of strychnia and 1 grain of citric acid in f ʒij of water, add 1 pint of elixir of Calisaya bark with iron, mix and filter.

ELIXIR OF CALISAYA BARK WITH IRON AND BISMUTH.

Dissolve 128 grains of pyrophosphate of iron and 128 grains of ammonio-citrate of bismuth in 2 fluid ounces of distilled water, add 14 fluid ounces of elixir of Calisaya bark; mix and filter.

ELIXIR OF CALISAYA BARK WITH IRON, BISMUTH AND STRYCHNIA.

Dissolve 1 grain of sulphate of strychnia in f ʒij of water, add 1 pint of elixir of Calisaya bark with iron and bismuth; mix and filter.

ELIXIR OF CALISAYA BARK WITH IRON AND BEEF.

Dissolve ½ an ounce of extract of beef (prepared by Liebig's method) in 1 pint of elixir of Calisaya bark with iron; allow it to stand several days (if possible), and filter.

ELIXIR OF PYROPHOSPHATE OF IRON.

Soften 256 grains of pyrophosphate of iron in ½ fluid ounce of water, add 15½ fluid ounces of simple elixir; mix and filter.

ELIXIR OF BISMUTH.

Dissolve 256 grains of ammonio-citrate of bismuth in 4 fluid ounces of distilled water, mix with twelve fluid ounces of simple elixir, and filter.

ELIXIR OF VALERIANATE OF AMMONIA.

Dissolve 256 grains of valerianate of ammonia in 2 fluid ounces of simple elixir carefully add aqua ammoniæ until the solution is exactly neutralized; then mix with 14 fluid ounces of simple elixir; filter and colour with cochineal colour to a bright red.

ELIXIR OF VALERIANATE OF AMMONIA AND QUINIA.

Triturate 64 grains of valerianate of quinia until minutely divided, then dissolve in it 1 pint of elixir of valerianate of ammonia, and filter.

ELIXIR OF VALERIANATE OF AMMONIA, QUINIA AND STRYCHNIA.

Dissolve 2 grains of strychnia in f ʒij of water, by the aid of just sufficient valerianic acid; mix with 1 pint of elixir of valerianate of ammonia and quinia, and filter.

ELIXIR OF VALERIANATE OF QUINIA.

Triturate 128 grains of the valerianate of quinia until minutely divided, mix with 1 pint of simple elixir, carefully add valerianic acid until the liquid becomes clear, shaking after each addition, and filter.

ELIXIR OF VALERIANATE OF QUINIA AND STRYCHNIA.

Dissolve 2 grains of strychnia, minutely divided, in f ʒij of water by the aid of just sufficient valerianic acid; mix with 1 pint of elixir of valerianate of quinia, and filter.

ELIXIR OF VALERIANATE OF STRYCHNIA.

Dissolve 3 grains of strychnia in f ʒij of water by the aid of just sufficient valerianic acid; mix with 1 pint of simple elixir, and filter.

ELIXIR OF BROMIDE OF POTASSIUM.

Dissolve 1 oz. of bromide of potassium and 1 oz. of sugar in 1 pint of simple elixir; add 20 minims of solution of oil of orange and 10 minims of solution of oil of bitter almonds, and filter. Colour with cochineal colour.

ELIXIR OF BROMIDE OF SODIUM.

Prepare this like elixir of bromide of potassium, substituting bromide of sodium for bromide of potassium, and omitting the colour.

ELIXIR OF BROMIDE OF AMMONIUM.

Prepare this like elixir of bromide of potassium, substituting bromide of ammonium for bromide of potassium, and omitting the colour.

ELIXIR OF HOPS.

Add 2½ fluid ounces of fluid extract of hops—made according to formula for F. E. Gentian, U.S.—to 13½ ounces fluid ounces of simple elixir; mix and filter.

ELIXIR OF LUPULIN.

Triturate 2 ounces of fluid extract of lupulin with 2 ounces of carbonate of magnesia, add 14 fluid ounces of simple elixir; transfer to a bottle, agitate occasionally for several hours, and filter.

ELIXIR OF GENTIAN AND PYROPHOSPHATE OF IRON.

Triturate 100 minims of solution of oil of orange with 2 ounces of sugar; dissolve it in 8 fluid ounces of elixir of pyrophosphate of iron and 6 ounces of simple elixir, add ½ ounce alcohol and ½ a fluid ounce of fluid extract of gentian; mix and filter.

ELIXIR OF CHLORAL HYDRATE.*

Dissolve 2 ounces of chloral hydrate in 1 pint of simple elixir, and filter.

WINE OF IRON.

Dissolve 128 grains of ammonio-citrate of iron in f ʒij of water, add 1 pint of wine of orange; mix and filter.

BITTER WINE OF IRON.

Dissolve 128 grains of soluble citrate of iron and quinia in f ʒij of water, add 1 pint of wine of orange; mix and filter.

WINE OF WILD-CHERRY BARK.

Mix 1 ounce of fluid extract of wild-cherry bark, 2 fluid ounces of syrup of wild-cherry bark, 10 minims of solution of oil of bitter almonds, and 13 fluid ounces of wine of orange. Allow to stand several days, and filter.

WINE OF WILD-CHERRY BARK AND PYROPHOSPHATE OF IRON.

Soften 128 grains of pyrophosphate of iron in f ʒij of water; add one pint of wine of wild-cherry bark mix and filter.

WINE OF BEEF.

Dissolve half an ounce of extract of beef (Liebig's method) in one pint of wine of orange, and filter.

WINE OF BEEF AND IRON.

Dissolve half an ounce of extract of beef (Liebig's method) in one pint of wine of iron, and filter.—*Pharmacist.*

LYCOPERSICUM ESCULENTUM.—TOMATO.

BY THOMAS D. M'ELHENIE.†

My experiments have been directed solely to the isolation of the organic acids contained in the fruit, the examination being undertaken at the suggestion of my preceptor, Mr. T. A. Lancaster, who had in an essay, presented in 1859, demonstrated the presence of tartaric acid, but expressed the opinion that citric acid would be found to exist in it in larger proportion, and probably in sufficient quantity to render it available as a commercial source of the acid. The variety on which I operated was the red tomato, known in the market as the "Tilden"; this is quite solid, of a medium size, and contains comparatively little juice. There are other inferior varieties which contain a larger amount of juice, and have more acidity of taste, and I expect these would be found to contain a larger proportion of acids; but being at the time unable to procure any of them, I was obliged

* This elixir was first prepared by me at the request of a gentleman who habitually used the chloral hydrate, and he finds that the chloral dissolved in this way retains its virtues most completely during the period required for the consumption of one quart. For this reason I have given the formula for its preparation, thinking that if such a preparation is desirable this seems to serve the purpose.

† Extracted from an Inaugural Essay.

to content myself with an examination of the variety named.

I have employed two processes in my examination; the first being mainly that given in the British Pharmacopœia for the preparation of citric acid from lemon juice.

One gallon of juice, freshly expressed from fully ripe tomatoes, was heated to the boiling-point and strained. Keeping it at about 200° F., powdered chalk was added until effervescence ceased. After cooling, the precipitate was separated by straining and filtration, and mixed with two pints of water. To the mixture was gradually added three pints of water, mixed with four fluid ounces of sulphuric acid, some effervescence being produced, probably due to an excess of calcium carbonate. The mixture was boiled gently for half an hour, and filtered. The filtrate, after partial evaporation, was set aside to allow any calcium sulphate which might be present to crystallize. After standing twenty-four hours the liquid was decanted—there being a slight sediment, but no crystals—and evaporated until a slight film began to form on the surface, when it was again set aside.

After standing about three weeks there was a considerable deposit of brown extractive matter, having a crystalline appearance, from numerous small crystals imbedded in it. As this extractive evidently retarded the formation of crystals, and being pressed for time, I continued the evaporation at a gentle heat, until the whole was reduced to the consistence of an extract, which I brought with me on my return to the college, for further examination.

Upon resuming operations in the laboratory of the college, I first made a preliminary examination of a small portion of the mass, according to the method directed in Will's tables, and found present citric, malic and oxalic acids. In order to isolate them, the mass was boiled with a sufficient quantity of water, and the solution filtered. A small quantity of inert matter was left undissolved. The filtrate was neutralized with calcium hydrate, and the precipitate separated by filtration, and reserved.

The filtrate from this was evaporated and boiled until the calcium citrate was precipitated, which was then washed with hot water, on the filter, mixed with a small quantity of pure water, and decomposed by dilute sulphuric acid; the calcium sulphate was allowed to deposit, the liquid was filtered, concentrated and set aside.

After three days a number of crystals were found deposited, but mixed with some viscid colouring matter.

The mother-liquor was decanted, and after concentration was set aside for further crystallization. The first crystals were dissolved in a small quantity of distilled water, the solution filtered, concentrated, and set aside. After standing twenty-four hours no crystals had formed in either liquid. They were then mixed, concentrated and filtered. After standing about two weeks, a small quantity of crystals had formed.

These were separated, and the mother-liquor again concentrated, when a very small product was obtained.

Owing to press of other duties I did not purify the resulting crystals. The yield was, however, very slight, being probably ten grains from one gallon of fresh juice, equal to about nine pounds of fruit.

To obtain the malic acid, the filtrate left after precipitation of calcium citrate by boiling was concentrated, and calcium malate was separated by the addition of alcohol. Allowing it to subside, it was separated by filtration, and the filtrate again treated with alcohol to separate any remaining malate. A small quantity was obtained, and after filtration it was mixed with the first product. This was then dissolved in a small quantity of hot water, the solution filtered, and, after partial evaporation, mixed with an equal bulk of alcohol, and the mixture treated with dilute sulphuric acid.

The resulting calcium sulphate was separated after it had completely subsided, and the filtrate, containing malic acid in dilute alcoholic solution, was partially concentrated. After standing twenty-four hours, no crystals having appeared, it was further concentrated and set aside.

After standing about two weeks, I found it had deposited a quantity of coloured inert matter. It was again partially evaporated and filtered, and in a few days a quantity of crystals were obtained.

While engaged in purifying these with animal charcoal, the entire product was lost by the accidental breaking of the capsule containing the solution, so that I was unable to ascertain the exact weight of the purified product. It was, however, larger than that of citric acid.

To obtain the oxalic acid, the precipitate obtained by neutralizing the original solution with calcium hydrate was treated with hydrochloric acid, the solution diluted, filtered, and neutralized by ammonia, when calcium oxalate was precipitated.

This was boiled with a solution of potassium carbonate for two hours, and filtered to separate calcium carbonate. The filtrate was then mixed with alcohol to just below the point of precipitation, and the mixture treated with dilute sulphuric acid. The potassium sulphate being insoluble in alcohol, readily subsided, leaving oxalic acid in alcoholic solution.

This was then partially evaporated and set aside. After standing several days, a deposit of colouring and extractive matter was formed. This was separated, and the solution further concentrated and treated with animal charcoal.

After a few days I obtained a quantity of small crystals. These were dissolved in a small quantity of distilled water, and again treated with animal charcoal and recrystallized. The yield was about equal to that of malic acid.

The second process was as follows: One gallon of fresh juice was boiled down to the measure of two pints. This was set aside and occasionally observed. After it had been standing about two weeks I found no result except the formation of a considerable brown deposit of extractive. It was then mixed thoroughly, and evaporated at a gentle heat to about three fluid ounces.

This was then operated on in essentially the same manner as the first, diluting the liquid, filtering and neutralizing with calcium hydrate, and then isolating the acids from their lime salts.

The results were similar, the yield of malic acid being rather larger. It has been stated tartaric acid existed in tomatoes in small quantities. I failed to obtain it, but hope at some future time to continue an investigation of various small acid fruits, and repeat that of tomatoes with better facilities. I infer from the results obtained that the acids exist uncombined in the fruit.

It is evident, however, that tomatoes are not available as a source of either of the acids.—*Amer. Journ. Pharm.*

NEW DESCRIPTION OF VALVE FOR GLASS TUBES.

Messrs. Kay Brothers, of Stockport, have invented a simple and effective contrivance which they propose to adapt to infants' feeding-bottles for the purpose of preventing the return into the bottle of food after it has once been drawn into the suction tube. In these bottles the suction tube consists, as may be seen in the woodcut, of a piece of ordinary glass tubing, contracted at the bottom to fit the rounded end of a small piece of glass, which freely passes up and down and acts as a valve. When suction is applied this valve is raised as far as the indentation in the tube, thus permitting the free ingress of the food to the tube; upon the removal of the suction it falls, and blocking up the orifice, prevents the return of the food, and therefore the necessity of exhausting the air afresh

The Pharmaceutical Journal.

SATURDAY, JUNE 1, 1872.

Communications for this Journal, and books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to ELIAS BREMRIDGE, *Secretary*, 17, *Bloomsbury Square, W.C.*

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

SOOTHING SYRUP.

THE value of quietness is variously estimated by the persons immediately and individually concerned. There is, however, much less difference of opinion as to the advantages of soothing the disturbers of our peace, in whatever character they appear, and procuring quietness at their expense and without inconvenience to ourselves. But here, again, there are many forms of persuasists, and some persuaders approach so nearly to the limit of coercion that legal objections are taken to their use; and hard labour, in lieu of rest, is the penalty which dogs the heels of those who favour their employment.

The value of quietness is very well known to baby-farmers, and with them it is reduced to a market price, and has its regular quotation. In Mr. ERNEST HART's evidence before the Infant Life Protection Committee of the House of Commons, he gave the customary quotations, ascertained in the course of his inquiry into the subject of baby-farming, which has led to the introduction into the House of Commons of the Bill now in progress. It varied, if we remember rightly, from a penny to twopence a day, according, we presume, to the pretensions of the baby-farmer or the squallings of the baby. A deduction according to this tariff was found to be commonly made where the mother supplies the "quietness" with the baby; the extra payment is demanded when the baby-farmer is expected to purvey food and quietness.

Translated from pastoral into pharmaceutical language, quietness means drugging by opiates; and to baby-farmers who live to save appearances, and to mothers who prefer to indulge in the luxury of fine sentiments, together with an easy and vicarious performance of maternal duties, the reading of a plain-spoken article recently published by Dr. W. F. M'NUTT, of San Francisco, will produce much distress. "Mrs. WINSLOW's Soothing Syrup—a poison." Pharmacists are well aware of the fact that this and most, if not quite all, the soothing syrups, cordials and elixirs sold for the especial benefit of infants, under the most amiable titles, conceal opium, which is unquestionably a deadly poison, and one which needs the utmost care and skilled vigilance to rob it of its danger when infants are compelled to swallow it. According to an analysis which this physician quotes as reliable (*American Journal of Pharmacy*, May 1st, 1871), ten drachms of Mrs. WINSLOW's Soothing Syrup were found to contain "nearly one grain of morphia, and other opium alkaloids, to the ounce of syrup." The specimen of soothing syrup analysed was made by CURTIS and PERKINS, of New York, who are the only manufacturers. According to Dr. TAYLOR, GODFREY's cordial was found by Dr. PARIS to contain half a grain to an ounce. A case has been reported where half a tea-spoonful of GODFREY's Cordial which equalled one thirty-second part of a grain of opium, was found to have caused the death of an infant; in one year twelve children were reported to have been killed by this mixture alone. DALBY's carminative contains, according to Dr. PARIS, one-eighth of a grain of opium to an ounce; one tea-spoonful, therefore, contains one sixty-fourth part of a grain of opium; but, says TAYLOR, "like most of these preparations it varies very much in strength." An infant is reported to have been poisoned by forty drops of this nostrum; thus it will be noted that the whole tribe of infantile soothers belong to the tribe of poisons. Of none, however, has so terrible an account ever been given as that given by Dr. M'NUTT of this American invention. The directions quoted are "for a child of six months old and upwards, one tea-spoonful three or four times a day, until free from pain." A tea-spoonful of this compound, according to the quoted analysis, contains little less than twenty drops of laudanum. Three drops is as much as a prudent physician would venture to give; and if such directions be widely disseminated and generally carried out, it is only surprising that we do not hear yet more frequently of inquests upon narcotized infants.

Certainly the Inspectors under the Infant Life Protection Bill should direct their attention to this subject, and it is one to which pharmaceutists can not be indifferent. We do not know to what extent our English children may be soothed by this particular agent, but Dr. MURRAY of San Francisco, states—"I have ascertained that there are about one hundred thousand two-ounce bottles of it sold annually in this city, containing about one hundred and eighty thousand grains of morphia which are given annually to the babies of this State."

From this datum it is calculated that 14,000,000 grains of morphia are annually administered to the babies of the United States. The objections to passing a prohibitory law against narcotic nostrums for children are not so strong as the objections to a Maine liquor law for adults, for infants cannot be supposed to have as yet either a natural or an acquired craving for stimulants, and their free will is rather impaired than improved by compulsory drugging.

Admitting, however, the existence of considerable difficulties in the way of any compulsory legislation of this kind, it is obviously improper that the most dangerous preparations of opium should be sold for administration to the most sensitive subjects without adequate, clear, and invariable notice to their responsible guardians as to the character and dose of the potent drug which they are administering. Every coroner will, we believe, concur in the opinion that the blind and ignorant use of opiates is a fearfully fertile cause of infantile mortality; the testimony of poor-law medical officers, clergymen and pharmacists is to the same effect. The dangers of such a system are increased by veiling them, and those who persist in applying this coercive "quieting" to their infants should not be allowed to shelter themselves under the plea of ignorance, of delusion, or misdirection. In this, we believe, all pharmacists will concur. The process of "angel-making" will find no abettors in our ranks, and pharmacists will be among the first to forbid this massacre of the innocents. If we are to have woman suffrage, the female legislators might with advantage occupy themselves with this subject at their earliest convenience.

BRITISH PHARMACEUTICAL CONFERENCE.

The Town Council of Brighton has generously placed one of the best rooms in the Pavilion at the disposal of the Conference for the Annual Meeting of August 13th and 14th.

To make any very great improvement in the excellent Feeding Bottles that are now offered to the public by several manufacturers would appear to be a difficult task, and there is little doubt that, in the main, that article will retain its present form for many years. But a simple contrivance that has been introduced by Messrs. Kay Brothers, of Stockport, for the purpose of preventing the return of the food from the tube into the bottle when suction is removed, has the merit of ingenuity and of accomplishing the object desired.

While upon this topic we may remark that where india-rubber fittings are used, they should always be made of pure unvulcanized black tubing, since it is to the sulphur used in the process of vulcanization that the generation of sulphuretted hydrogen sometimes complained of is due.

Dr. Mackintosh, of Downham Market, states in the *Lancet*, that a groom having, while cleaning the surgery, helped himself to a quantity of sulphate of zinc, under the belief that it was Epsom salts, let his imitative faculty have play by prescribing and administering an ounce of it to—himself. Violent vomiting and severe purging soon followed, and painful cramps and other uncomfortable symptoms were felt during the next day; but on the third day he was able to walk, and has since quite recovered,—a result that his master attributes to the greater part of the sulphate having been thrown off by the vomiting, and the remainder by the purging.

Transactions of the Pharmaceutical Society.

EXAMINATIONS IN LONDON.

May 22nd and 24th, 1872.

Present—Messrs. Allchin, Barnes, Bird, Carteighe, Cracknell, Davenport, Edwards, Gale, Garle, Haselden, Ince, Linford and Southall.

PRELIMINARY.

The undermentioned Certificates were received in lieu of this examination.

Certificate of the Law Society of the United Kingdom.

Evans, Robert Lloyd ...... Birmingham.

Certificates of the College of Preceptors.

Crook, Charles W. W. .... Plymouth.
Allen, Charles Bowen .... Penzance.

Certificates of the University of Oxford.

Atkins, William Ralph...... Salisbury.
Hubard, Alfred Edward .... Birmingham

Certificate of the University of Cambridge.

Simon, Henry James...... Burgh-le-Marsh.

MAJOR.

Five candidates were examined; of these *three* failed. The following *two* passed, and were declared duly qualified to be registered as Pharmaceutical Chemists:—

*Kendall, Edward Basnipp.. Nottingham.
Laugher, William .... West Bromwich.

MINOR.

Forty-nine candidates were examined; of these, *twenty-five* failed. The following *twenty-four* passed, and were declared duly qualified to be registered as Chemists and Druggists:—

*Walden, Robert Woolley...... Newark.
Dismorr, Henry.............. London.
Evans, Gwilym .... Swansea.
Elliman, Samuel Francis ...... London.
Adams, Frederick Joseph...... Gravesend.
Appleton, Arthur James ...... Attercliffe.
Equal { Turner, Joseph Kitchin ...... Whitehaven.
Equal { Verity, William .... Northampton.
Corder, Sheppard Ransome .... Norwich.
Greaves, Abraham Walter .... Chesterfield.
Crisp, Frederick Arthur ...... Clapham.
Nicholls, Arthur Lindley .... Shanklin.
Brown, George Matthew...... Landport.
Savell, Edward Pearce ...... Southampton.
Simcock, George .... Birmingham.
Stewart, Edward Hinton .... Tiverton.
Russell, Matthew Rawlings .. Whitehaven.
Savery, William Henry ...... Burslem.
Tansley, Arthur James ...... Cheadle.
Francis, William Henry ...... Diss.
Walton, William Henry ...... Croydon.
Allison, Reuben.............. Glantwrch.
Eckersley, Moses .... Wigan.
Partridge, Samuel, jun. ...... Dudley.

The above names are arranged in order of merit.

* Passed with honours.

Provincial Transactions.

NORWICH CHEMISTS' ASSISTANTS' ASSOCIATION.

A lecture upon "Coal Gas" was delivered at the rooms of the above Society, by Mr. P. H. Mason, on Wednesday, May 22nd.

The Chairman (Mr. Thompson), in opening the meeting, said he had just been informed that Mr. Sutton could not be present, and that Mr. Mason at the last moment had kindly consented to take his place. Much as he regretted the absence of Mr. Sutton, he felt sure Mr. Mason would not only instruct but amuse them.

The Lecturer began by describing the process employed in the manufacture of gas; and after briefly noticing the by-products, gave a very explicit account of the constituents of good gas, and the more frequent impurities. He also explained the causes that led to variations in the quality of gas, and showed some experiments illustrating the methods used to obviate these variations, and to increase the illuminating power. Finally, he demonstrated the methods for estimating the impurities and illuminating power.

The lecture was fully illustrated by experiments, which evoked repeated applause.

The Chairman, in a humorous speech, moved a vote of thanks to Mr. Mason, which was seconded by Mr. Martin. The meeting concluded with a vote of thanks to the Chairman.

Proceedings of Scientific Societies.

ROYAL INSTITUTION.

Friday, February, 9, 1872.

On Sleep.

BY PROFESSOR HUMPHRY, F.R.S.

The Professor first gave a brief account of some of the changes that take place in the tissues when their function is active, and explained that during this time a slight deterioration of structure takes place, which affecting the voluntary system—the muscles and the hemispheres of the brain—causes the sense of tiring, and necessitates a period of rest for the restoration of the tissue to its former condition. In the case of the muscles this rest is provided for by periods, quickly alternating periods, of action and cessation of action. But in the case of the brain, the actions upon which consciousness, volition, etc., depend, cannot be thus frequently suspended. Their continuance is needed for the safety of the body during long periods, through the whole day for instance; and longer periods are therefore required for repair. These are the periods of sleep.

He next took a cursory glance at the different parts of the nervous system, explaining that the upper regions of the brain are those which minister to consciousness and volition, the intellectual operations, etc. He showed that the functions of these regions not only can long be suspended without interfering with the action of the lower parts of the brain which are more immediately necessary to life, but that they are very easily suspended, slight causes, such as a jar or a shock, or an alteration in the blood current, being sufficient to stop the action of these parts, and deprive the person of consciousness. The spontaneous stoppage of their action, consequent on the slight deterioration of their structure from the continuance of their functions during the day, is the proximate cause of sleep during the night; and the periodic recurrence of sleep is in accordance with the periodicity observed in several of the nutritive functions, and indeed witnessed in many of the other operations of nature.

After observations upon the condition of the brain during sleep, the circumstances that conduce to sleep, the time that should be allotted to it, and other points, the Professor entered at some length into the subject of dreams. These he regarded not, as has been supposed by some, to be a necessary attendant on, or feature of, sleep, but rather to be the result of an abnormal condition. In the natural state we should pass from wakefulness to complete unconsciousness, and *vice versâ*, quickly, almost instantaneously; and many persons habitually do so. But the transition period is sometimes prolonged, and stages are observable. The first thing that occurs is the lowering or cessation of that control over the mental processes which is the highest of our powers, the one requiring the greatest effort and the one most easily lost. In this condition the thoughts ramble unchecked, chase one another confusedly over the mental field, and give rise to all sorts of incongruities of the imagination. At the same time being unrestrained, they are excited, and evince efforts of memory and even of combination which in the regulated state of wakefulness they are quite incapable of. In this way the images of persons and places, of events and items of knowledge long forgotten in the ordinary state, are recalled with distinctness; and we fancy that new information has been acquired, when it is only forgotten facts that are recalled. He did not agree with the physiologists who conceive that dreaming depends upon an inequality in the condition of different parts of the brain, some being excited or wakeful, while others are quiescent or asleep. He rather took the view that all the parts of the cerebral hemispheres combine in each of the efforts of control, consciousness, memory and other mental acts, that all suffer alike from these effects, alike need the restoring changes which take place in sleep, and together *pari passu*, pass through the stages on the way to and from sleep in which dreaming, sleep-walking, etc., occur.

SOCIETY OF ARTS.

April 24, 1872.

Nuts, their Produce and Uses.

BY P. L. SIMMONDS.

Continued from page 960.

The nutmeg may, perhaps, be included under the edible nuts, as it is an important article of commerce In the four years ending with 1841 the average import was only 121,000 lb. In 1850 it had risen to 312,418 lb., and now the import and consumption is 538,000 lb., worth 1*s.* 6*d.* per pound.

Formerly the production was a monopoly of the Dutch East India Company; and although the cultivation has been attempted in other quarters, it only succeeds in the Straits Settlements and the Islands of the Eastern Archipelago. In the Banda Islands the produce is about 530,000 lb. annually (in 1847 it was as much as 755,000 lb.), and all above that quantity used to be rigorously destroyed. The collected nuts when ripe are dried in the sun or by the heat of a moderate fire till the shells split. They are then sorted and sometimes dipped in lime-water, to preserve them from the attacks of insects.

The shape of the nutmeg varies considerably, being spherical, oblong, and egg-shaped; but the nearer they approach sphericity of figure, the more highly are they prized. Those of good quality should be nearly round, heavy, weighing on an average ¼ of an ounce.

The broken nuts are made to yield, by expression or boiling, a concrete oil, termed nutmeg-paste or butter, which is used for flavouring. Its specific gravity is about ·948. What is erroneously termed oil of mace is obtained by distillation from the nutmeg, and should bear its name.

The long (wild or male) nutmegs of commerce are the produce of *Myristica tomentosa*, and are not so much esteemed as the round.

The cashew-nut (*Anacardium occidentale*) is another tropical fruit, occasionally imported for its sweet kernels, and which has this peculiarity, that the nut is attached to the fruit, instead of growing within, as is usually the case. A thick, black, oily, viscous juice, called cardole, is obtained in the East Indies from the pericarp, which is a powerful vesicating agent. The white kernel, which is oleaginous and of an agreeable flavour, furnishes an oil considered superior to olive oil.

From North America small quantities of two edible nuts, the peccan and the hickory, are occasionally imported. The former is the seed of *Carya olivæformis*, the latter of *Carya alba*. An excellent oil for burning and machinery has been made from the hickory-nut, in

Ohio, which continues in a fluid state at a very low temperature. It is used for delicate machinery, and when properly refined would be suitable for watchmakers. The pig-nut, *C. glabra*, is preferred in the manufacture, on account of its thin shell and greater yield of oil, which is bitter. The oil obtained from the ordinary shell-bark, and large sweet hickory-nut, might come into general use for the table.

The sapucaya-nut is a pleasant edible nut, which comes in small quantities from South America. The fruit in the capsule is suspended from the branches, and presents an appearance like small cocoanuts. The monkeys are exceedingly fond of the nuts.

The "cabombas," or cups of the Zabucai or monkey-pot (*Lecythis urnigera*, Mart.), which contain the sapucaya-nuts of commerce, are frequently of great size and excessive hardness, and are closed by a lid like that of a pyx or soap-box. The aborigines of parts of South America use these not only as goblets, but as pots and dishes. Hence Linnæus called the plant *Lecythis ollaria*. The lid of the cup falls off when ripe. Portuguese turners make pretty boxes and other fancy articles out of these solid cups. In the Brazilian Court, at the London Exhibition of 1862, some handsomely-carved and mounted specimens were shown.

The butter-nut, or Souari nut, is the fruit of *Caryocar tomentosa*, of South America. Only very small quantities are received. It yields an edible oil. The fruit of another species, *Caryocar brasiliensis*, furnishes, in Brazil, the Piquia concrete oil, of a brown colour, retaining much of the flavour of the fruit.

In China and Japan, under the name of gingko nuts, the seeds of *Salisburia adiantifolia* are eaten.

Before passing from this section of edible nuts, I may draw attention to the various fancy uses in the series kindly shown by Messrs. Fortnum and Mason, which includes pistachio nuts and pistachio chocolates, glacé walnuts and marron glacés, green candied almonds, burnt almonds, sugared almonds, and sugared nuts. And in contrast with these finished products of the confectionery trade, we have the almond and cocoanut rock of the sweet shops, for children, which sell under the curious names of stick-jaw and eggs and bacon.

Oil Nuts.

I pass on now to a consideration of the oil-yielding nuts. I might properly speak of the olive as the principal one, which would as equally of right come into the category as some other oil-bearing seeds and fruits I shall have to allude to, but then, as it is never spoken of commercially as a nut, I must pass it over.

After the olive, the palm family furnish the principal quantities of oil to commerce, in those two important and well-known oils, palm oil and cocoa-nut oil. From the fruit and kernels of the oil palm of Western Africa (*Elais guineensis*) we now draw our largest supply of vegetable oil. In the year 1808, 200 tons of palm oil were received from Africa; in 1827 the quantity had increased to 4700 tons. Some few years later it had risen to 14,000 tons. What do we find it now? Last year (1871) 51,087 tons, valued at £1,789,000, were imported. Palm oil has become one of the most important articles of commerce from the west coast of Africa, especially to this country, although we are not the only importers. The collection and shipment has done more than anything else to suppress the slave trade. The oil, as manufactured for home consumption in Africa, is slightly different from that prepared for export. It is darker coloured, and is obtained by beating, pressing, and boiling the fruit (sarcocarp). Palm-nut oil is obtained from the seed or kernel by roasting, beating, and boiling. Formerly these kernels were thrown away; now they form an important trade. In 1863, the palm kernel trade, then newly introduced, furnished for shipment at Lagos 2665 tons of oil; in 1869, 20,394 tons were exported from that port, besides one and a half million gallons of palm oil.

The next great source of oil from the palm is that obtained from the pulp of the cocoa-nut; and considering the wide-spread range of this palm, it is strange that the import of the oil has made such little progress compared with its great rival, the African oil palm. One reason may possibly be that the fruit is more generally used for food, and for the refreshing drink in the nuts when young. The cocoa-nut palm is cultivated in great abundance on the Malabar and Coromandel coasts, Ceylon, the Laccadives, and everywhere in the Straits Settlements and the islands of the Eastern Archipelago.

In the West Indies, Central America, and Brazil, the cocoa-nut is extensively grown; there are groves of it for about 280 miles along the coast of Brazil, from the river St. Francisco to the bar of Mamarguasse. From Pará alone 7½ million cocoa-nuts, worth £130,000, are annually shipped to the United States and elsewhere.

The cocoa-nut is very widelyspread over the Pacific Islands. From the Fiji Islands 500 to 600 tons of oil and 1500 cwt. of cocoa-nut fibre are annually shipped. The trees there, however, suffered severely a few years ago from a violent hurricane, from which they have hardly yet recovered.

Many years ago Dr. Royle estimated the average produce of cocoa-nuts from the whole of Malabar at from three hundred to four hundred millions annually, valued at £500,000, and copperah, or the dried kernels, was exported for as much more. Thirty years ago there were in Travancore more than 5½ million cocoa-nut trees, and since that period the cultivation has largely increased, as the demand for the oil and the coir has advanced. From Cochin more than 3000 tons of the latter are exported.

I have not alluded to cocoa-nuts under edible nuts, although the 3½ millions imported here doubtless go to the fruiterers' shops and hucksters. They are brought principally from the West Indian Islands, British Guiana, and Honduras, and range in price from 12*s*. 6*d*. to 17*s*. 6*d*. per 100. Some small quantity of dried copperah is also imported, for the oil-presser's use. The husk forms an important article of commerce, and is readily bought by the brushmakers, being even more valuable than the nut. The quantity of nuts imported would yield about 530,000 lb. of coir.

The products of the cocoa-nut are numerous; besides the oil, fibre, yarn, rope, and matting, brushes and brooms are made of the coir from the husk; spoons, ladles, drinking-cups, and carved fancy articles from the shell.

So far back as 1857 the value of the products of the cocoa-nut, shipped from Ceylon, was £274,462, viz.:—

		Value. £
Cocoa-nuts. . . .	1,420,856 No. ..	3,717
Coir rope	18,881 cwt. ..	13,984
Coir yarn. . . .	31,652 ,, ..	21,364
Copperah or dried cocoa-nut pulp	20,381 ,, ..	12,143
Oil	1,767,431 gals. ..	223,254

These were chiefly the produce of native plantations, situated on the south-west side of the island.

There were about 22,000 acres of cocoa-nut trees under cultivation by Europeans, which were being annually added to, but none of them were then fully in bearing.

In the ten years ending with 1869 the value of the shipments from Ceylon were—

Oil.	£1,445,928
Coir	349,622
	1,795,550

The quantity of oil shipped does not vary much, being on the average 1½ million gallons yearly; but the coir has doubled in the last ten years, now amounting to

67,000 cwt., worth about £45,000, for the mere husk of the cocoa-nut.

A cocoa-nut tree, growing in a favourable soil in Ceylon, may produce from 80 to 100 nuts annually, having from eight to 12 branches, or spadices, each bearing five to 15 nuts. It continues to bear for 60 or 70 years. The pericarp of 40 nuts gives about 6lb. of coir. In some parts of Ceylon the natives separate the coir by burying the husks along the borders of the extensive salt-water lakes, whence, after a few months, they are dug out very clean, the fibres easily separating from the cellular tissue of the husk. This mode of preparing the fibre prevents the offensive smell emanating from macerating the husk in water.

The following is an analysis of the cocoa-nut:—

Water	39·7
Albumen	0·5
Emulsin	1·1
Oil	29·3
Amygdalin	14·0
Sugar	3·6
Woody fibre	9·5
Gum	1·2
Mineral matter	0·2
	100·0

Or, in other words, the proportions in one pound of the kernel are:—

	oz.	grs.
Water	6	14
Albumen		35
Emulsin		77
Oil	4	303
Amygdalin	2	106
Sugar		252
Woody fibre	1	228
Gum		147
Mineral matter		14

The oil is ordinarily procured by first extracting the kernel from its outer integument or shell, and boiling it in water. It is then pounded, and subjected to strong pressure. After boiling over a slow fire, the oil floats on the surface. This is skimmed off as it rises, and again boiled by itself, Fourteen or fifteen nuts will yield about two quarts of oil. A somewhat different practice obtains on the Malabar Coast. The kernel is divided into half pieces, which are laid on shelves, and underneath a charcoal fire is kept in order to dry them. After two or three days they are placed on mats, and laid in the sun to dry, after which they are put in the oil press. When the oil is well extracted by this method, a hundred nuts will yield about two and a half gallons of oil. This is the method usually resorted to when the oil is required for exportation, the former when merely used for culinary purposes.

Of late years the application of steam power or hydraulic pressure for the purpose of procuring the oil has been attended with the greatest advantage in Ceylon. It is requisite that care should be taken not to apply too great and sudden a pressure at once, but by degrees an increasing force, so as not to choke the conducting channels of the oil in the press. The oil becomes solid at about 70°. It is curious that when cocoa-nut oil is first manufactured there is no unpleasant smell for the first 30 or 40 hours, but after that it acquires that rancid taste and peculiar odour which no scent will entirely kill. Fresh expressed cocoa-nut oil is used by the Malay women in the Eastern Archipelago in the hair. It is perfumed by allowing the flowers of the jasmine, the tuberose, and other plants to remain for some time in it, the fat oil of the nut extracting and retaining the essential oil of the fragrant flowers. Cochin oil bears a higher price than that of Ceylon. Poonac, or the refuse oil-cake, is sold as food for poultry and for manure.

The trade in cocoa-nut oil is steadily increasing at the Seychelles; fresh plantations are being laid out, and others coming into bearing. The quantity shipped in 1869 was 127,112 gallons, valued locally at about £16,000. From Penang there is an export trade in oil and copperah. Cocoa-nuts are grown in small quantities throughout the Straits Settlements, but it is only here and there that plantations of any magnitude are met with.

Coir is the fibrous rind of the nuts, with which the latter are thickly covered. There are several ways of stripping the fibre from the husk. One is by placing a stake or iron spike in the ground, and by striking the nut on the point the fibre is easily stripped. The fibre is greatly improved in quality and appearance by beating, washing and soaking. The tannin which this subject contains prevents the fibre from rotting. The fibre is rather difficult to twist, but coir-yarn is made into good ropes, and forms the strongest, lightest and most elastic cables for ships.

The fibrous husk of the cocoa-nut is not its least valuable product, and gives rise to a very large trade both in the East and to Europe. At first it was much used in this country for stuffing mattresses and cushions, but its applications have been enlarged and its value greatly increased by mechanical processes; and in a small pamphlet issued by Mr. Treloar twenty years ago, he stated that its natural capabilities having been brought out, coir has been found suited for the production of a variety of articles of great utility and elegance of workmanship, table mats, fancy baskets and bonnets. Instead of being formed into rough cordage only, and mats fabricated by hand, by means of ingeniously constructed machinery, the fibre is rendered sufficiently fine for the loom, and matting of different textures with coloured figures is produced, while a combination of wool in pleasing designs gives the richness and effect of hearthrugs and carpeting. Brushes and brooms for household and stable purposes; netting for sheepfolds, pheasantries, and poultry-yards, church cushions and hassocks; hammocks, clothes lines, cordage of all sizes, and string for nurserymen and others; for tying up trees and other garden purposes; nose bags for horses; mats and bags for seed crushers, oil pressers, and candle manufacturers, are only a few of the varied purposes to which the fibrous coating of the cocoa-nut is now applied. The cocoa-nut shell furnishes cups which, carved on and set in silver, are a great ornament. It also makes small baskets, cups, ladles, spoons, and other such domestic articles, and fanciful ornaments. By being burned and pulverized and prepared with other ingredients, it produces blacking not inferior to Day and Martin's, lamp black, black-paint, etc.

The fruit of the Chili palm (*Cocus chilensis*) is, in every respect like the cocoa-nut, except that it is not larger than a walnut, about an inch in diameter. Every tree produces a great number, which are highly esteemed, and they form a considerable article of export to Peru. A curious method is employed to free the nut from the green husk in which it is enveloped, a process that was formerly attended with a very great loss of time and labour. A number of cows and oxen are driven into an enclosure, where a quantity of the fruit is spread, and being fond of its husk they immediately begin to feed on the fruit, only slightly masticating it in the first instance, and swallowing the whole. Afterwards, while chewing the cud, the nuts are rejected, and when the meal is finished, a heap of them is found before each of the animals, perfectly free from the husk, and thus the cattle are supplied with food at a season when little grass remains on the hills.

Before leaving cocoa-nuts, I must not omit mention of the sea cocoa-nut of the Indian Ocean, the produce of *Lodoicea Seychellarum*.

The fruit, from floating in the sea, was known long before the plant which produces it, or the locality in which it was found, and various fables were invented as to its origin, and marvellous virtues attributed to it.

The few known specimens which existed were valued at an enormous price till, in 1745, the discovery of the Seychelles Archipelago made known the habitat and nature of this singular production. Three of the islands composing the archipelago—Praslin, Cunense, and Ile Ronde—were covered with magnificent forests of this unique palm, and their soil strewed with its huge and singularly shaped nuts. The value of their shells as domestic utensils for various purposes was at once perceived, and from that time to the present they have supplied to the inhabitants the place of baskets, bowls, jars, dishes, measures for grain and liquids, drinking vessels, paint-pots, etc. The trees are fast being destroyed. On Ile Ronde not a plant remains. Cunense has a considerable number of fine young trees. At Praslin a great many have been destroyed by fire, and there are not, perhaps, a score of trees in the other islands. This palm is of very slow growth, for the trunk does not show itself till twenty or twenty-five years after the germination of the seed, and then it takes fourteen or fifteen years before it blossoms.*

I have no recent statistics of the trade in these nuts; but in 1859, 3,310 of these were exported, valued at £831, and 11,800 lobes or cups made of them, valued at £590. Although they have now lost much of their traditional repute, they are still held in such estimation by the negroes and poor people of other islands, that sailors always try to bring away some in their vessels. When preserved whole, and perforated in one or two places, the shell serves to carry water, and two of them are suspended from opposite ends of a stick. Some of these nuts hold six or eight pints. If divided in two between the lobes, each portion serves, according to its size and shape, for plates and dishes, or drinking-cups, these being valued, like calabashes, for their strength and durability.

A fixed oil (called Manteiga de Assahay) is extracted by decoction from the fruit of the *Euterpe oleracea* palm, which abounds in Pará. The oil is of a greenish colour, slightly bitter, and used for lighting and other purposes.

The pulp of the fruit of the Aoura palm, of Guiana (*Astrocaryum vulgare*), yields an oil which is used for many different purposes. A yellowish, bitter oil, used for soap-making in Brazil, is obtained by decoction and expression from the fruit of *Sagus taedigera*, which is abundant in Pará.

From the nuts of *Œnocarpus bacaba*, a palm also abundant in Brazil, an oil of a clear green colour is obtained, which, when purified, is used for lighting and culinary purposes. From the fruit of other species—*O. pataua* and *O. disticha*—fluid oils, clear, yellow, and transparent, are obtained, which, when purified, are inodorous, and used in cooking in place of olive oil.

There are two or three species of *Carapa*, the nuts of which yield a fixed oil. Crab oil of Guiana is from the *Carapa guianensis*. It is extremely bitter, but used externally for the hair and for soap-making. It is abundant in Pará, where it is known as andiroba oil. The nuts are so common in some of the districts of French Guiana that, when they are ripe, the soil is covered at least a foot deep with them for many hundreds of yards. That of Africa, known as mote grease, from mote or kundoo nuts, is from the *Carapa talicoonah* or *touloucouna*, which yields 33 per cent. It yields 70 per cent. of oil.

I have here a pomade alleged to be made with this oil, and said to be used by the East Indians for beautifying, softening, and increasing the growth of their hair, and which, according to the label, has wonderful properties; but it is to be regretted that intelligent pharmaceutical chemists should not have known, after figuring and labelling the plant with its scientific name, that Guiana is not in the East Indies, and that the oil is not likely to be carried and used there when an allied indigenous species, *Xylocarpus granatum*, is to be met with.

(*To be continued.*)

* Mr. George Clarke, in 'Annals and Magazine of Natural History.'

Parliamentary and Law Proceedings.

THE SHIPPING OF BENZINE.

The following letter in reference to the report of a case heard at the Thames Police Court, which we last week quoted from the *Daily News*, has been addressed to that journal by Messrs. Curling, of St. Mary Axe:—"In your impression of Wednesday, in the report of the proceedings against our firm, for shipping a case of benzine without notifying its contents, it is stated in error that the case shipped and containing benzine had been described on the outside as 'Patent Medicine.' We beg to state that the goods were not shipped for our account, that the words 'Patent Medicine' were not written on the case, and that the consignee's mark and number 'P. H. and Co., 721,' were the only marks upon it. The omission of the word benzine, complained of by the dock company, arose from accident only. But the alleged false representation of the contents of the case as being 'Patent Medicine' (given in the report) obliges us to request a correction of the latter statement, as it is calculated to injure us, and is without the slightest foundation."

Reviews.

THE STUDENT'S POCKET COMPANION TO THE BRITISH AND LONDON PHARMACOPŒIAS OF 1851 and 1867, comprising the Formulæ of both Pharmacopœias in Parallel Lines, an Abbreviated Materia Medica, Tables, etc., with a Medico-Botanical Map. By GEORGE BARBER, Pharmaceutical Chemist. Sixth Edition. London: Philip and Son, and Simpkin, Marshall and Co. 1872.

The usual result when a "pocket companion" has arrived at the dignity of a sixth edition is that it ceases to be adapted to any other pocket than that of an "Ulster" great coat, or of a prestidigitateur. So many temptations to improvement, so many additions that might be useful, present themselves, and it is so necessary to keep abreast of the time with new information, that the compiler requires to exercise considerable discrimination in culling the choicest only, or his work will soon belie its original name One proof at least of the fitness of the compiler of the work now lying before us is to be found in the fact that, while it contains far more matter, it would really take less room in the pocket than the third edition. This is due to the ingenuity with which every part of the book is made use of, even to the apoplectic-looking title-page.

One feature of this little volume is that in almost every section the subjects are arranged in what might be termed a "graphic" manner. The arrangement of the P. L. and P. B. formulæ in parallel columns, which enables the mind more readily to compare differences and to associate them together, is characteristic of the plan of tabulating information which is acted on throughout.

Some of the sections that appear for the first time in this edition will prove very useful and interesting. On the inside of the cover at the commencement of the book is one of Mr. Bellow's ingeniously contrived concentric calculators* for the conversion of grams into grains, and at the end is one for the conversion of litres into fluid ounces, drachms and minims. There is also a "pharmaceutical or medico-botanical map of the world," in which the names of the articles of the materia medica yielded by a district are set down after the fashion of the names of towns in ordinary maps. As far as it goes, this picturesque way of teaching materia medica, although not new, is interesting; and it is curious to notice how in a few spots—Central America and the West Indies, India and the Eastern Archipelago—the names cluster unusually thick. There are one or two points, however, that, without being hypercritical, might be objected to.

* See PHARM. JOURN., 3rd ser. Vol. I. p. 396.

For instance, although the last edition of 'Pereira' tells us that "the source of Brazilian isinglass is unknown," it does not help us much to see the name "Isinglass," set down in an inland district of Brazil, about equidistant from the Atlantic and Pacific Oceans, and far from any river marked in the map. Tapioca, too, is rather vaguely placed—almost alone—in the centre of Africa, certainly a part from which at present a very small quantity is received. The synopsis of the chemical reactions which take place in the preparation of the acids, salts, etc., and a synopsis of the elements and salts of the British Pharmacopœia, present that information in a compact form, and a scale having on one side the Fahrenheit degrees, and on the other the Centigrade degrees, together with a scale of four inches side by side with one of ten centimetres, give a clearer idea of the relations of the several systems than can so easily be obtained in any other way. The sections under the titles "American Eclectic Remedies," "Granulated Preparations," "Suppositories," etc., are very suggestive of an origin in another well-known "Companion;" this, however, may perhaps be accepted by the author of that work as a compliment.

In closing our notice of this little book we would suggest that, although the larger part of the work appears to be stereotyped, to cancel a page now and then would be preferable to the adoption of the clumsy expedient of reproducing the errors of former editions and adding a slip of errata. The book, however, is so well suited to the purpose for which it is issued, that there is little risk in predicting that its compiler will have many opportunities of remedying any slight defect it may contain.

The Chemical Note Book for the Use of Students. London: S. Deacon, King Street, Borough. 1872.

To those chemical students who regularly take notes while at work—and no methodical study of chemistry can be carried on in any other way—this book will be very useful. It consists of a series of blank forms, in which the student can enter a description of the substance upon which he is experimenting; and of the deportment of its solution with such reagents as hydrochloric acid, sulphuretted hydrogen, ammonic sulphide, ammonic carbonate, sodic phosphate, etc.; record additional experiments for the detection of metallic or non-metallic constituents; and finally, supposing his search to be successful, the name of the substance and confirmatory experiments. The forms are bound in a stiff cover, and sold at a very moderate price.

MEETINGS FOR THE ENSUING WEEK.

Monday, June 3. ......*London Institution*, at 4 p.m.—"Elementary Botany." By Professor Bentley.

Tuesday, June 4. ......*Royal Institution*, at 3 p.m.—"Development of Belief and Custom." By Mr. E. B. Tylor.

Wednesday ...*Royal Microscopical Society*, at 8 p.m.

Thursday, June 6. ......*Royal Institution*, at 3 p.m.—"Heat and Light." By Dr. Tyndall.
Chemical Society, at 8 p.m.
Linnean Society, at 8 p.m.

Friday ....*Royal Institution*, at 9 p.m.

Saturday, June 8. ......*Royal Institution*, at 3 p.m.—"Chemical Action of Light." By Professor Roscoe.
Royal Botanic Society, at 3·45 p.m.

The following journals have been received:—The 'British Medical Journal,' May 25; the 'Medical Times and Gazette,' May 25; the 'Lancet,' May 25; the 'Medical Press and Circular, May 28; 'Nature,' May 25; the 'Chemical News,' May 25; 'English Mechanic,' May 24; 'Gardeners' Chronicle,' May 25; the 'Grocer,' May 25; the 'Journal of the Society of Arts,' May 25; 'Grocery News,' May 25; 'Moniteur Scientifique-Quesneville' for May; the 'Canadian Pharmaceutical Journal' for May; the 'Leavenworth Journal of Pharmacy' for May.

Notes and Queries.

*** *In order to facilitate reference, correspondents are requested to mark their answers in each case with the title and number of the query referred to.*

No notice can be taken of anonymous communications. All queries or answers should be accompanied by the name and address of the writer.

[315].—MOUSTACHE POMADE.—Will any correspondent kindly favour me with a recipe for a pomade or paste that will change the colour of a very light or grey moustache to a dark brown, or a mouse colour, without staining the skin or injuring the hair.—Delta.

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[316].—REMOVAL OF STAINS.—I shall be obliged if some reader will kindly give me a form of preparation for removing pyrogallic acid and nitrate of silver stains from the skin without injuring it.—A. R.

ADULTERATION OF PEPPERMINT OIL.—It is stated by Mr. E. B. Shuttleworth, in the *Canadian Pharmaceutical Journal* (vol. v. p. 272), that large quantities of American oil of peppermint had been imported into Canada which, upon examination, was found to be adulterated with castor oil and alcohol. The writer having submitted 55 lb. to distillation, obtained an oily distillate which, when separated, consisted of 18 lb. of oil of peppermint of good quality; the residue in the still (21 lb.) was found to be castor oil, and the difference between the sum of these two weights and the original quantity represented the amount of alcohol present. A mixture of these constituents in the above proportions yielded a clear and presentable oil, strongly resembling the genuine article. Its density was slightly lower (·894 at 60° F.), its reactions with iodine were precisely similar, and it dissolved perfectly in rectified spirit. The presence of the fixed oil may, however, be detected by the characteristic stain it leaves upon paper, and that of the alcohol by agitation with an equal volume of water, when a milky emulsion will be produced.

PREPARATION OF KOUMISS.—The following instructions for the preparation of Koumiss have been sent to the *British Medical Journal* by Dr. Townsend, of Cork, who says that Koumiss so prepared was used by his father, many years since, in the treatment of phthisis, and answered well:—

"Take one quart of new milk, one noggin of good thick milk or fresh butter-milk, and three or four lumps of white sugar. Mix all together from jug to jug till the sugar is quite dissolved. Put it in a warm place to stand for ten hours. It will then be quite thick. Pour it again from jug to jug till it is smooth. Bottle it in soda-water bottles; let it remain in a warm place for thirty-six hours (twenty-four in summer). Use the best velvet corks; tie them down; shake the bottle well for five or six minutes before it is opened. It will have whey at the bottom when fit for use. It is to be made every day, and taken in quantities. Its fermentation is the test of its excellence."

ETHER GLUE.—An excellent liquid glue is made by dissolving glue in nitric ether. The ether will only dissolve a certain amount of glue, consequently, the solution cannot be made too thick. The glue thus made is about the consistency of molasses, and is doubly as tenacious as that made with hot water. If a few bits of india-rubber, cut into scraps the size of buckshot, be added, and the solution be allowed to stand a few days, being stirred frequently, it will be all the better, and will resist the dampness twice as well as glue made with water.—*Scientific American*.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

CLAUSE 16 OF THE PHARMACY ACT.

Sir,—At the Annual Meeting last week, I drew attention to the 16th clause of the Pharmacy Act, which says that it shall be lawful for any executor, administrator or trustee, to carry on business for the benefit of a widow, by means *only* of a duly qualified assistant, and I stated that I knew of several instances of injury and hardship arising out of the effect of this clause. I gave a case in point:—A widow was left sole executrix, and the property and business devised to her absolutely. She administered, took possession in her own undoubted right, and then her troubles began—"Her name was not on the register;" a "brother in trade" took note of this, informed our excellent secretary, and he, bound hand and foot by Clause 16, sent her notice under pains and penalties that "she must qualify or sell" within a given time. She was nearly fifty years of age, her children all daughters, and passing even the Minor was in her case impossible. I went with her and a friend to the Society, met with a kind official reception, and came away with the assurance that she had no right to carry on the business in her husband's name, while her own name had no legal status; she therefore sold for £800 that which had brought in a clear profit of £460 a year, thus losing at least £400 a year, and started life again by attempting to keep a school, which will be a long time before it keeps her. She is, however, well-fitted for her compulsory work; and if any of my brethren wish a child well cared for, I shall be happy to forward her name and address.

We all make mistakes, and a mistake has been made in passing this clause; can nothing be done to remedy it? And would it not be well for every husband and father in making his will, to see to it, that he understands Clause 16 of the Pharmacy Act of 1868?

Praying you to grant me space for this communication, I am, etc.,

WM. FRED. SMITH.

London, 280, *Walworth Road*,
May 22*nd*, 1872.

[*** Mr. Smith appears to overlook the fact that the widow to whom he alludes was carrying on the business of Chemist and Druggist *on her own account*, and that she could not therefore claim the special exemptions provided in the Pharmacy Act, 1868. The 16th section of the Act, which creates the exceptions, must be strictly construed in favour of the public, so that the widow of a deceased chemist and druggist would not stand in any more favoured position than any descendant, ancestor, or collateral relative of a deceased chemist and druggist; in short, no relative of a chemist and druggist can claim any special exemption in right of relationship, and *the only persons who can claim the special exemptions are those who stand in positions of trust as defined by the Statute.*—ED. PHARM. JOURN.]

PHARMACEUTICAL EDUCATION.

Sir,—At a time when there is so much difficulty about pharmaceutical education, it is, I think, the duty of all connected with our business to aid the important consideration with such practical suggestions as may occur to their minds. On reading the discussion on this subject at the Annual Meeting, and observing the uncertainty in which the matter remains, it occurs to my mind that the best plan would be to concentrate the completion of the pharmaceutical education at Bloomsbury Square, and to make some such arrangement as the following:—Require that every apprentice should spend the last four or five months of his indenture at the Society's rooms, and be boarded and lodged in two or more houses under the control of a superintendent, and be required to attend the necessary courses of lectures, and afterwards undergo the necessary Minor and Major examinations, so as to qualify him for going into business or taking a responsible situation, the whole matter, including board, lodging, and instruction, to be limited to a sum not exceeding £25. There should be, I think, two sessions of four or five months' duration during the year; and assuming there would be, say 150 at each, the sum at disposal for this purpose would amount to £3750 to each session, or £7500 per annum.

JOS. TAPLIN.

13, *Corn Street, Bristol*,
May 26*th*, 1872.

Sir,—Your Report of the Annual Meeting will have been read throughout the country with a feeling of gratification that the cause of provincial education has come so prominently forward. The subject was so thoroughly discussed that it may seem impertinent to add another word; but I should like to raise one voice in urgent support of Mr. Schacht's (or the Government) plan of "aid for results," as being the most just in principle and the most extensive in application.

The existence of provincial associations is an encouraging feature; and if the choice lay between aiding them and confining pecuniary advantages to "the square," little could be said against their receiving the requested help. It is policy not to lose for want of asking, and not to ask too late. But if the principle is to be "each association for itself," the usual benison is likely to fall upon the "hindmost"; and if progress is to move on this line, it must be two generations before we of the country, pure and very simple, can hope for any benefit. We, "rurals," compared with our brethren of the metropolis and of the large towns, must always be in the position of country mechanics who, with their rude implements, have to compete with their *confrères* of the city who have the help of every modern invention. Schools of chemistry!—classes for the study of botany!—associations for education! They are the pleasures of Tantalus. Education is a mount that we must climb alone, uncheered by the voices of our fellows. We carry, very much "'mid snow and ice, the banner with that strange device." We are asking little when, having climbed, we desire "aid for results"—aid to be given in proportion to the means at the disposal of the Council, and hence to the detriment of none. The large towns, with their larger advantages, would get the larger share; to them that have would be given; but the solitary chemist in the country would put in his claim on achieved success, and feel that he had a share in the commonwealth, for the scheme is calculated to call forth the latent talent of the country.

I am greatly pleased to find that Mr. Schacht has been returned to the Council so near the top of the poll. I trust that he will so powerfully advocate his own plan that it will be adopted by the executive, and thus secure—what it should be the aim of all executives to attain—the highest good of the greatest number.

HENRY H. POLLARD.

Ryde, May 27*th*, 1872.

CHEMISTS' CLUB.

Sir,—Some twelve months ago, I believe the subject of a 'Chemists' Club" was suggested in your columns; at the time, I must say I thought but little of it, but having since had to come to town to attend the Laboratory previous to the Society's examinations, I have much felt the want of such an institution, and have heard many remark how glad they would be of a "Club," or some place of resort where they could have the comforts of home combined with moderate charges.

If any (and I am sure there must be several) amongst your numerous subscribers have felt this want and would like to see it supplied, I should be very pleased if they would communicate their ideas in your next number.

ONE WHO WOULD GLADLY BE A MEMBER.

May 14*th*, 1872.

WOMEN AND PHARMACEUTICAL EXAMINATIONS.

Sir,—Are women admitted to the examinations of the Pharmaceutical Society, or were the founders of the opinion of Cornelius,

"I do not like her . . . I know her spirit,
And will not trust one of her malice with
A drug of such damn'd nature"?

INTERROGATIVE.

[*** According to Mr. J. Stuart Mill's definition of the word "person," a woman may present herself for examination.—ED. PHARM. JOURN.]

The Microscope in Pharmacy.

Sir,—With reference to Mr. Pocklington's article on the "Microscope in Pharmacy," in which he mentions his recent discovery of the fact that ground-nut cake is used as an adulterant in coffee, cocoa, etc., I beg to say that this sophistication was first detected and fully exposed by me in the 'Food Journal' of March last, a matter of priority which I think was entitled to some notice at his hands.

I may mention that, out of the hundreds of samples which have come under my observation as analyst to the above journal, I have never found this starch in anything but two samples of cocoa, which, although bought at different shops, emanated, I believe, from the same manufacturers. Its flavour when roasted would prevent its being used for coffee to any extent, and I am sure the sample of butter referred to by Mr. Pocklington as containing both *Arachis hypogea* and *brains* is an exceedingly exceptional case; good mutton and beef fat being much more easily obtainable and better suited in every way to the views of the butter makers than either of these rare adulterants.

John Muter, Ph.D., F.C.S.

231, *Kennington Road, S.E.*,
18th May, 1872.

*** For the satisfaction of Dr. Muter the above letter has been submitted to the author of the article in question, who has forwarded to us the following reply:—

"I have much pleasure in admitting Dr. Muter's claim to priority in exposing the use of *Arachis hypogea* in adultera tion of cocoa, etc. My omission to ascribe "honour to whom honour is due" may be explained by the fact that I had not read the article in 'Food Journal,' to which Dr. Muter alludes, at the time I wrote the article in which I refer to the use of *Arachis*. As Dr. Muter is aware, independent discoveries and rediscoveries are not only possible but exceedingly probable in work of this description, where we have to deal with facts of tolerably easy observation.—H. P."

Chemists and Druggists' Entrance Fees.

Sir,—I was glad to notice that Mr. Vizer brought the above subject before the Annual Meeting. I have always held that it was very impolitic on the part of the Council to demand them, and unjust to the body of chemists and druggists. We are told, however, that as outsiders we have done nothing for the benefit of the Society, and therefore it is only right and fair we should pay a fee for the privilege of becoming a member. My object in writing this letter is to inquire what is the privilege in connection with the Society that calls for two guineas? It can't be the Journal; that I read regularly and can borrow at any time. Perhaps some of your readers that have paid the fees can enlighten my understanding on this point, because I am quite willing to become a member and should have joined two or three years ago but for this fee barring the entrance. And whatever privileges belong to membership, I have always held—right or wrong—that a chemist and druggist on the other hand confers a benefit on the Society upon becoming a member. Mr. Vizer clearly proves this in his remarks, and I trust the entrance fees will be swept away altogether. R. B.

Halifax.

*** We trust some of our readers will respond to this inquiry, and in deference to our correspondent's desire that they should do so we abstain at present from saying anything more than to suggest that the question of *cui bono* should not be considered merely in regard to direct individual advantage.—[Ed. Ph. Journ.]

Sir,—Love of fair play impels us to address a few words to you in reference to a suggestion advanced at the Annual General Meeting, viz., to raise the Minor examination fee to eight guineas.

We should like to know of the gentlemen who so zealously desire to "clap it on" to the already sufficiently embarrassing impediments between the poor assistants and the inevitable examinations,—are our supervisors prepared for their part to "clap on" a compensating increase on the salaries they offer; or do they expect to raise the status—or rather compel the assistants to raise for themselves their degree of qualification, "including analysis, toxicology, and so forth," and yet continue to offer such scandalous salaries as appear unblushingly in the advertisement columns of the Journal; for instance, £20 to £25 (in the number for May 4th). It is no refutation of this to say that there are some, and there are we know, honourable exceptions. "Too many want the pudding without paying for it," as Mr. Humpage said.

We speak feelingly on behalf of those who will have to encounter what we have passed through; and perhaps it was the same cause produced the contrary effect on the gentleman who advocates that severity on the "Minors" that will no longer affect him, and the abolition of members' subscriptions that perhaps would affect him, more agreeably.

Anyhow we fail to see the logic of his arguments. The humble "Minor," with his notoriously pitiful "screw," is to be mulcted of nearly treble the present fee, whilst "those alone who have the extra abilities (?) and ambition"—the Majors, who mostly go in for the title with the view of using it in business on their own account—their "honorary title" is to be made "more valuable and appreciated" by abolishing fees; or making them life members for five guineas!

Now in our humble judgment, if any alteration is needed to encourage the ambitious and at the same time deter the incompetent, some such plan as this would be far more equitable and efficacious.

Let the successful (and therefore presumably deserving) candidates have returned to them the greater portion of their fees, say two-thirds, while as to the too ambitious and unprepared ones, who give the examiners most trouble, let them lose more than at present, say proportionate to their deficiency as shown by their marks. On this simple principle might be adjusted a sliding scale of reward for merit, and at the same time a salutary detergent to warn off "those who are not so fully qualified as they should be." Not to take up more space that may be better occupied, we remain,

J. P. C.
J. S.
A. J. T. } A Minor Triumvirate.

24, *Methley Street, S.W.*

Pharmaceutical Curiosities.

Sir,—I live a very few miles from London, just on the borders of Buckinghamshire, and have been often struck with the "peculiar" knowledge that is required to supply the wants and requests of the "chaw-bacon" population about here.

I have had applications for "sollofolossity" (I write it as pronounced), and because I at first hesitated, and failed to catch the meaning of the strange sound, I was looked upon as profoundly ignorant of the first principles of "yokel" materia medica.

I have been asked for "karplumb," of which to this day I remain in hopeless ignorance; "blood markery," "gum cotcheter," "skivender leaves." By way of helping me, I asked what the latter were for, and was informed for "lapputs of the jints." Not being sufficiently informed with regard to "lapputs," I was unable to supply my customer, but dare say he got "skivender leaves" lower down or higher up, for there are a great many "shining lights" in our street.

I had a somewhat obscure prescription from one of our rural physicians the other day, and will enclose it for your perusal. I question if you or our respected London examiners could translate it, so have written our interpretation underneath.

2 p of blodsom peaive. (2*d.* balsam of capivi.)
2 p of grans of blood. (2*d.* of dragon's blood.)
2 p of rotan apal. (2*d.* bitter apple. Written above rotten apple.)
2 p of sweet niter. (2*d.* sweet nitre.)

I could write a very curious dictionary of synonyms, but you have had a full dose now, and it is the kind of stuff to be administered only *pro re natâ;* but if agreeable you may have the dose repeated at a moderate interval.

Uxbridge, March 26th, 1872. Flint.

Sir,—Thinking that some of my brethren in the trade may feel somewhat interested and amused at the strange compounds in use by our ancestors, I send an extract from an old pharmacopœia of 1693, entitled *Pharmacopœia Bateana.* The contrast of the two P. B.'s (past and present) is rather striking. The following is a formula for preparing Vinum Ecphracticum; a wine opening obstructions:—

R. Live Earthworms, having a red Circle on their Necks No. 24, bruise them in a Marble Mortar with Currants cleansed ℥iv., adding Rhenish Wine lb iij., Crystal Mineral (dissolved in the Wine) ℥ss, strain and make it very limpid and pure by often passing it through Hippocrates his sleeves. Dose ℥iij thrice a day with Aqua Cinnamomi hordeata ℥j. It is a noble Diuretick.

Vinum Viperinum.

R. Live Female Vipers, gathered in the Spring time, No. vj. digest them (the vessel being stopt) without heat for six months, in lbvj. best Spanish wine or Canary, then strain out for use. It is a most celebrated thing against the Leper Grecorum or Leprosie, the Elephantiasia, Barreness, Plague, &c., and prolongs Life. Dose ℥iij. or ℥iv. twice a day for some considerable time.

Syrupus Limacum. Syrup of Snails.

R. Garden Snails gathered before the Rising of the Sun, freed from their shells and cut in pieces lbj. Sugar Candy in fine powder lbss., mix them and put them into Hippocrates his Sleeve in a Cellar, that the Liquor may drop through in a syrup. Dose j. spoonful every hour, in Ulcers of the Lungs, Consumptions, &c.

Spiritus Sanguinis.

Distil it from the Blood of a sound young Man, putrefied in Sand, and then rectifie it, S. A.

I might go on multiplying formulæ equally quaint and nasty, but hesitate to encroach on your space.

C. S. Miller.

Newport, Isle of Wight,
April 18th, 1872.

Pharmaceutical Mnemonics.

Sir,—That 50 per cent. of those who enroll for the Minor examinations are frequently "plucked" can by no means encourage the numerous candidates; however, each has his fling, and trusts that the gods will be propitious and the examiners not too severe. Sometimes the greatest "muff" succeeds, and the intelligent mind who could hardly endure the drudgery of cramming the Pharmacopœia receives a remittance of two guineas, with a polite intimation that he may resume his studies for another three months. One reason that so many fail is that, being obliged to devote so much time in committing to memory the compositions and proportions of the multitudinous preparations of the Pharmacopœia, little time remains for the far more important and interesting studies of chemistry and botany. But since the examiners are inexorable, and their laws, like those of the Medes and Persians, unalterable, cannot something be done to lighten our load? Since no man cares to remember two hours after he has passed his examination the composition of charta epispastica, or the infinity of preparations into which cinnamon, ginger, and camphor may enter,—could not the "sublime crammer" Stokes come to our assistance?

Many mnemonical systems have been tried, but the majority have failed from their impracticability, and their ponderous machinery. Perhaps one of the simplest methods of committing to memory is by association, and the occasional use of doggerel rhymes. Who could forget that œgle marmelos belonged to the Natural Order Aurantiaceæ, if he would only associate Marme*los* and Marma*lade*? What schoolboy does not remember the exceptions to the general rule of nouns of the second declension ending in *us*, from the fact that,

"Alvus, humus, vannus, colus,
 Though belonging to the second,
Are feminine; and virus (juice),
 With pelagus, are neuter reckoned;
Vulgus mostly goes with these,
But may be masculine if you please"?

When the ingredients to a preparation are numerous, it may be useful to compose a distich, as for,

Emplastrum Calefaciens,
 Resin, Wax, Soap, Plaster, and Nutmeg Oil,
 Resin, Plaster, and Flies (the water must boil).

Or three lines may be required as for Mistura Ferri Aromatica:

Let the bark, cloves, calumba and finest iron wire,
With mint water stand till three days expire,
Tinctures, orange, and Cardamoms then ye'll require;

or the hexameter verse may sometimes serve as for Emplastrum Cantharidis,

Cantharidis, resin, and wax, and then there's suet and lard.

It may be occasionally necessary to find some strange resemblance betwixt words; imagine an examiner showing you some Pareira root, and asking you what it was, what would be your immediate reply? "*Cissampelos Pareira.*" Resembling, "This sample is Pareira." Or sometimes things may be easily remembered from the fact that they are not what their names would indicate. I have never failed to recognize the root of the Veratrum viride, the moment I remarked that though viride may mean green, this root has a decidedly yellow tinge; and I can easily remember that though bis may mean twice, bismuth has not bivalent but trivalent quantivalence. When you wish to remember the atomic weight of iron, think of an iron 56 lb. weight falling on your toes. That the egg which is ordered in the Pharmacopœia in the preparation of the Mistura Spiritus Vini Gallici, is obtained from the Gallus Banckiva will never be forgotten if you will picture to yourself a French cock crowing on a bank; or that the *Sambucus nigra* belongs to the Natural Order Caprifoliaceæ, the moment one imagines a goat eating elder leaves in a country lane.

The fertile genius of the pharmaceutical student will furnish him with a thousand mnemonical tricks if he will only habituate himself; and the more ridiculous the similarity which may exist betwixt the two ideas, the more easily will they be remembered.

Let us hope that some day a little less drudgery and more science will be required of us, in the meantime we will humbly bend to the yoke of our venerable and worthy examiners and *cram*. S. F. E.

Tinct. Ferri Perchloridi.

Sir,—I have just observed, in p. 806 of the Journal, Mr. Wilson's suggestion respecting Tinct. Ferri Perchlor., and incline to query whether a still better plan would not be to use equal parts of Sp. Vini. Rect. and Aq. Dest. for diluting the strong solution. This makes it keep well, and for retailing at any rate the use of weaker spirit need hardly be objected to.

April 16th, 1872. J. F. T.

Messrs. Curling and Co.—Your communication to the 'Daily News' did not appear until after last week's number of this Journal had gone to press.

W. G. Taplin.—We are unable to understand your question. We know of no such class as that to which you appear to refer.

"*Dyson.*"—(1.) Mix the essential oils with the olive oil and shake with an equal bulk of water; then pour in the alkalies gradually, shaking after each addition; next add the remainder of the water, and lastly the tinct. cantharid. (2.) The work mentioned is a very good one.

G.—An answer to your question will be given in a future number.

M. P. S.—We are not able to give any reply to your question, which is one that falls within the province of a medical man.

"*Lux.*"—We think the label you propose would require a stamp, but recommend you to consult the Excise authorities at Somerset House.

J. Davidson. — (1.) Ranunculaceæ. (2.) Leguminosæ. (3.) Aurantiaceæ.

"*Pharmacist.*"—They could be ordered through Messrs. Williams and Norgate, Henrietta Street, Messrs. Trübner, Paternoster Row, or any respectable foreign bookseller.

J. Hindle.—There is no limitation as to age.

"*Cecil.*"—(1.) You will find formulæ for Liq. Quinæ Ammon. on pp. 675 and 737 of the first volume of the present series. (2.) Bentley's 'Manual,' Oliver's 'Elementary Botany,' or Cooke's 'Structural Botany.' (3.) The usual subscription for the current year.

P. Z.—Chi'rāta.

Communications, Letters, etc., have been received from Mr. H. Long, Mr. Rimmington, Mr. R. Procter, "Delta" "Shade of Cocker," T. B.

THE ECONOMIC AND MEDICINAL VALUE OF THE GENUS RHUS.

BY JOHN R. JACKSON, A.L.S., MUSEUM, KEW.

Some attention has recently been directed in Natal towards the cultivation of various species of *Rhus* yielding sumac as a prospect of establishing a new industry in the colony. As an article for the dyers' and tanners' use, sumac ranks very high. In North America the berries as well as the bark of *Rhus glabra* are extensively used by the country people in the preparation of a brilliant black dye. The berries are likewise used in medicine as a refrigerant and febrifuge. In Porcher's 'Resources of the Southern Fields and Forests,' we read, on the authority of Dr. Fahnestock, that an infusion of the inner bark of the root is employed as a gargle, and is considered almost as a specific in the sore throat attending mercurial salivation. An infusion of the leaves, sweetened with honey, is serviceable, applied in the same way, and for cleansing the mouth in putrid fevers. From another North American species (*R. copallina*, L.) a wash is made, which is used in the cure of ringworm. The berries are acid, and a cooling drink is made from them. The leaves are said to be used for adulterating tobacco. Several other species of *Rhus* grow in North America, some of which are introduced plants, but are valued on account of their chemical properties. The most interesting, however, are the extremely poisonous species, *R. venenata*, Dec., and *R. toxicodendron*, L. The accounts which have at different times been given of poisoning by these plants almost equal those of the upas. The following, however, as given by Dr. Bromfield, may be relied upon:—"The Rev. Dr. Bachman, of Charleston, being once on a botanical excursion with some friends in the neighbourhood of that city, they came upon a specimen of the poison ash (*Rhus venenata*, Dec.), and felt desirous of gathering specimens for examination. This they proceeded to do, though warned of the consequences likely to accrue from handling it. The doctor stood aloof from a danger which he knew to be inevitable in his own person on near approach or contact. The result was, some of the party suffered severely; the inflammatory action reaching up the arms to the trunk in one, in another only as high as the elbows, whilst in a third the effects were confined to the hands, which, as is usual in these cases, became swollen, inflamed and finally ulcerated. The rest mostly escaped the poison. On his return home, Dr. B. found a branch of the shrub in his vasculum, which had been put there by some sceptical joker amongst certain of the party, who affected disbelief in the poisonous properties of the plant. This he requested his daughter, who was not susceptible of the poison, to take out of the box and destroy; but, at her suggestion, permitted it to be dried for his herbarium. The next day symptoms of poisoning came on; intumescence of the entire body and lower extremities, attended with intolerable pain and irritation, confined him to bed for several days; nor was it till after many weeks that he was able to resume his duties. For several years after he was subject to a periodical recurrence of the erysipelatous inflammation which marks this particular poison." Other instances of poisoning by this plant have also been recorded; one in which some persons were seriously affected by the fumes arising from the wood while burning, the other in which a swarm of bees was poisoned simply by alighting on one of the trees.

Though none of the species of *Rhus* find a place amongst medicinal plants in use in this country,—except, perhaps, as homœopathic medicines,—several of them are so used in the States of America. The most important species, in a commercial point of view, are *R. coriaria*, L., and *R. cotinus*, L. Both of these are natives of Southern Europe, and furnish the well-known article known as sumac, which is the broken and powdered leaves and twigs, and is much used in tanning light-coloured leathers.

In South Africa several species of *Rhus* are known. At the Cape the bark and twigs of *R. tomentosa*, L., and *R. lucida*, L., are used for tanning purposes; and it is with the idea of increasing the value of the indigenous plants of the colony, as well as furthering the introduction of others, that the subject of sumac cultivation has engaged the attention of the colonists of Natal.

SULPHOVINATE OF SODA: ITS PREPARATION AND PURGATIVE PROPERTIES.

BY M. LIMOUSIN, PHARMACIEN.*

In the year 1870, the purgative properties and the advantages presented by the sulphovinate of soda over the other saline purgatives usually employed in therapeutics were pointed out by Dr. Rabuteau, in a memoir communicated to the Academy of Medicine. At the request of Dr. Blache, who desired to verify the assertions made in this communication, the author undertook to prepare some of the salt; and on the 21st of July in the same year he presented to the Academy of Medicine a specimen obtained by following pretty nearly the process indicated in most works on chemistry. This sulphovinate was very pure and well crystallized, but its high price (45 to 50 fr. the kilogram) was a serious obstacle to its introduction into therapeutics.

After several attempts, M. Limousin succeeded in obtaining the salt by a much more economical process, the description of which is the object of the present paper:—A kilogram of pure sulphuric acid, sp. gr. 1·715, and a kilogram of concentrated alcohol, about 96°, are introduced by means of two funnels (one for the alcohol and the other for the acid) into a third funnel arranged in a flask plunged into a freezing mixture or kept in a current of cold water, the flow of the two liquids into the flask being so regulated as to keep the alcohol in excess. The mixture is kept for four or five days at a temperature of 20° C. to 25° C., then diluted with five or six litres of distilled water, and saturated with about 1500 grams of pure carbonate of baryta diluted with a sufficiency of distilled water. When the point of saturation is attained, the liquid is left to deposit the sulphate of baryta, and afterwards filtered. The solution of sulphovinate of baryta so obtained is saturated by 850 to 900 grams of pure carbonate of soda dissolved in four litres of distilled water. When no more precipitate is formed by the addition of the alkaline solution, and the liquid is neutral to test

* Abstracted from a paper read before the Société de Pharmacie de Paris, March 6, 1872 (Journ. de Pharm. et de Chimie [4], vol. xv. p. 271).

paper, the transformation of the sulphovinate of baryta into sulphovinate of soda is complete. The liquor, decanted and filtered, is evaporated in a water bath to about sp. gr. 1·33, and left to crystallize. The crystals, after draining, are dried in a stove. The salt so obtained is of great purity, and may be kept without alteration. With the quantities above indicated, about one kilogram of the product is obtained. If the salt be free from sulphate of soda and sulphovinate of baryta, chloride of barium and sulphuric acid will not give a precipitate in a solution in distilled water.

Contrary to what has been said as to the instability of the sulphovinate of soda, M. Limousin has found that, when well crystallized and well dried, it may remain exposed to the air without decomposing, absorbing moisture, or efflorescing. A solution was kept for more than a year without decomposing into sulphate of soda and alcohol, which result, however, follows if it be heated to 120° C. or 130° C. It is necessary to use pure carbonate of baryta, since the native carbonate (witherite), besides containing impurities, is much less readily acted on by the sulphovinic acid; the carbonate, however, regenerated by the decomposition of the sulphovinate of baryta, may be preserved for future operations. The employment of carbonate of lime to saturate the liquid gives a bad result, as it is impossible afterwards to clear the solution from the lime, which prevents the crystallization.

The author finds that by this process one part of acid is sufficient for the transformation of one part of alcohol into sulphovinic acid, instead of the two parts usually indicated in chemical works; the use of half the baryta that would be necessary to saturate the excess of acid if two parts were used is thus saved. It is, however, very important to use a pure spirit, as when prepared with badly rectified alcohol, the salt has a disagreeable odour that cannot be got rid off.

The formula for sulphovinate or ethyl sulphate of soda is $C_4H_5O, NaO, S_2O_6 + 2HO$, or $(C_2H_5)NaSO_4 + H_2O$. It crystallizes in hexagonal tables, containing 10 per cent. of water of crystallization. It is freely soluble in water, dilute alcohol and glycerine; slightly soluble in absolute alcohol, and insoluble in ether. Its solubility is much greater than sulphate of soda, water at 18° C. dissolving only about 17 per cent. of the latter salt, but about its own weight of the sulphovinate. This difference might be utilized in saturating directly the mixture of sulphuric acid and alcohol with carbonate of soda, and obtaining the two salts in successive crystallizations.

A solution of sulphovinate of soda undergoes a lowering of temperature (13° C.) nearly double that of sulphate of soda (7·5° C.). Heated in a capsule over a lamp flame, the salt swells, and at about 180° C. disengages the alcohol it contains, which may be ignited; when, if the alcohol used has been well rectified, the bisulphate of soda remaining will be white; if not, it will be more or less coloured.

The sulphovinate of soda has the cool taste peculiar to all the salts of soda; it is nearly free from bitterness, and has a sweet after-taste that makes it more easily tolerated than the sulphate, while as a laxative it appears to be about three times more powerful than that salt, and much more prompt. It is given at the "Charité" to adults in 20 to 25 gram doses, and by Dr. Blache to children in 10 to 15 gram doses, sweetened with syrup. Among the advantages claimed for it over other saline purgatives are, that its administration is not followed by constipation, and that there is not the danger of the formation of vesical calculi that sometimes attends the use of salts of magnesia.

Sulphovinate of soda may be administered alone, dissolved in *eau sucrée*, or in a draught sweetened with a flavoured syrup, or in solution in water charged with carbonic acid. This last forms a beverage much more agreeable in taste than the citrate of magnesia, and has the advantage of not undergoing alteration for a long time.

SUPPLIES OF OPIUM AND SCAMMONY FROM TURKEY.

BY P. L. SIMMONDS.

It may prove interesting to the trade generally to have some reliable figures as to the two important drugs which we draw from the Ottoman Empire. In Turkish opium there has not been any important fluctuation of late, but the extraordinary increase in the imports of scammony in the last year of which we have the official details is remarkable, being about treble the ordinary supply. It probably arises from the scientific exertions of the Turkish authorities, and the practical information and instruction which have been diffused among the peasantry.

Opium.—From an examination of the official annual statements of the trade of the United Kingdom for some years past, we are able to trace out accurately our imports of opium from Turkey, and the value; these have been as follows:—

	lbs.	Value.
1866	214,399	£180,001
1867	294,277	248,015
1868	363,249	464,191
1869	230,886	382,471
1870	313,543	452,974

Although the official Board of Trade return, enumerating the principal articles received last year, has been published, the more precise annual statement, which specifies also the minor articles, will not be issued for some months to come.

An interesting monograph on the varieties of opium exhibited in the Turkish department of the last Paris Exhibition, was privately issued by Col. Fayk Bey, director of the central civil and military pharmacy, chemist to the palace, and professor of pharmacology to the imperial faculty of medicine at Constantinople. This document contained much valuable information, being the result of answers to official circulars addressed to the governors of provinces, as to the mode of culture, collection of the juice, manipulation and transformation into cakes, and nature of the commercial transactions at the seats of production. Moreover, a complete analysis was furnished of ninety-two specimens, which were shown.

On the culture and propagation of the plant I need not enter into details, but a few particulars respecting the collection of the inspissated juice may be given. Great care and vigilance are required to seize the proper time, when the bluish-green colour of the capsule begins to change to a golden hue, to incise it horizontally. Leaves of the poppy are first spread on the soil, to receive any of the milky juice which may accidentally drop. In localities subject to frequent showers, the incisions are made in the capsule about daybreak, and the milky juice which oozes forth is collected before noon. In the drier regions, where a more equable temperature prevails, the capsules are incised before sunset, because night favours the secretion of the sap, which is then collected on the following morning. After collecting the juice the capsules are left to ripen, the seed being saved for sowing, or for obtaining oil, and the oil-cake, after expression, is used either for manure or for feeding cattle. A certain quantity of the capsules, either broken and freed from the seeds or entire, are sold for pharmaceutical use. In certain localities the poppy seeds are eaten for pleasure, and sometimes, among those who give way to this practice, a slight narcotic effect is observed.

A deunum of good land (about 1600 square yards), well prepared, will yield from 2 to 2½ okes of opium and 5 bushels of seed. But the yield of both opium and seed varies considerably.

The inspissated juice is collected in earthen, copper or wooden vessels, and a few days later it is moulded or kneaded into shape by the hands, with heat. After exposure for some time to the sun, the lumps or cakes are rolled over *Rumex* seeds, and wrapped in poppy leaves, in which state they pass into commerce. The great variety of shape, size, and appearance of these cakes of opium is remarkable, for each locality seems to have a special type or form of its own.

The cultivator is always under heavy liabilities to speculators and dealers, who purchase his crop in advance, and 18 to 25 per cent. interest is considered moderate. From these factors it passes again through three or four hands before it arrives at the ports of shipment.

The opium obtained from small poppy-heads is the most rich in morphia, and siliceous clayey soils are found to be more favourable to the production of opium than light friable soils.

The following was the export of opium from certain localities in Turkey in the year 1866, which will serve as an indication to the principal seats of production:—

Localities.	Okes.
Ighakli	6,250
Tchol	3,125
Kikler	1,250
Bolvadina	3,125
Hanya	3,125
Sandikli	1,875
Chahvar	6,250
Cheiklou	12,500
Kara Hissar	18,750
Sihanli	7,500
Gueive	2,000
Lefke	200
Gueul Bazar	800
Kara Hissar Sahib	81,250
Kharpout (Malatia)	50
Rhodes	2
Baloukesser	2,000
Angora (Mihalidjik)	2,000
	152,052

As the oke is reckoned at 2¾ lb., this gives about 418,513 lb. of opium, the approximative local value of which was 40,000,000 of piastres.

If the growers were free from the rapacity of the usurer, no more profitable culture could be carried on than opium. Taking the ordinary yield of a deunum of land at 2 okes (5½ lb.) of opium, at the mean price of 230 piastres, and adding 5 bushels of seed worth at least 30 piastres the bushel, this gives a total value of 610 piastres. If from this 200 piastres be deducted for the maximum expense of cultivation, this leaves a profit of 410 piastres (about £4), a higher return than can be obtained from any other culture.

If it were not stated by an officer of the government, we should hardly have credited the extent of adulteration carried on, and which has to be guarded against by the purchaser.

Amongst the adulterating substances enumerated are scrapings and decoctions of the stem and leaves of the poppy, raisins, glucose, the pulp of fruit, the yolk of eggs, wax, marble, powdered bricks, rosin and galipot; all these are called into requisition to render the opium more heavy and to add to its bulk. Often 10 to 12 per cent. of water is added. Of late years one or two large shipping firms have retained chemists to analyse and certify to the quality of the opium they export, which is sold with a guarantee; but the small dealers and local druggists are still subject to all these current frauds.

(To be continued.)

Chapters for Students.

CHEMICAL NOTES TO THE PHARMACOPŒIA.

BY WILLIAM A. TILDEN, D.SC. LOND.

DEMONSTRATOR OF PRACTICAL CHEMISTRY TO THE PHARMACEUTICAL SOCIETY.

SULPHUR PRÆCIPITATUM.—Flowers of sulphur and slaked lime are boiled together with water for some time. The deep yellow liquid is filtered, cooled, diluted with water, and then acidified with hydrochloric acid, which throws down the sulphur in the form of a nearly white precipitate.

The principal changes which occur are exhibited in the two following equations:—

$$\underset{\text{Slaked Lime.}}{3[CaO\,.\,H_2O]} + \underset{\text{Sulphur.}}{5S_2} = \underset{\text{Pentasulphide of Calcium.}}{2CaS_5} + \underset{\text{Hyposulphite of Calcium.}}{CaS_2O_3} + \underset{\text{Water.}}{3H_2O}$$

$$\underset{\text{Pentasulphide.}}{2CaS_5} + \underset{\text{Hyposulphite.}}{CaS_2O_3} + \underset{\text{Hydrochloric acid.}}{6HCl} = \underset{\text{Chloride of Calcium.}}{3CaCl_2} + \underset{\text{Sulphur.}}{6S_2} \quad \underset{\text{Water.}}{3H_2O}$$

In consequence of secondary reactions occurring during the boiling, a little sulphuretted hydrogen is given off when the liquid is acidified. If sulphuric acid is employed instead of hydrochloric acid, a considerable quantity of sulphate of calcium is precipitated with the sulphur.

[§ A greyish-yellow soft powder free from grittiness and from the smell of sulphuretted hydrogen. When heated in an open vessel, it burns with a blue flame and the evolution of sulphurous acid. Entirely volatilized by heat. Under the microscope it is seen to consist of opaque globules without any admixture of crystalline matter.] The tests are designed to show that sulphate of calcium is not present.

Milk of sulphur is usually not entirely soluble in bisulphide of carbon, a small quantity of allotropic sulphur remaining behind.

SULPHUR SUBLIMATUM.—[§ Sulphur prepared from crude or rough sulphur by sublimation.] Sulphur is manufactured chiefly from native sulphur, which is imported principally from Sicily. It is also obtained from iron and copper pyrites, FeS_2 and $FeCuS_2$. Some considerable quantity is also recovered from "soda-waste," the impure sulphide of calcium obtained in the manufacture of carbonate of soda. By exposure to air this substance is partially oxidized and converted into hyposulphite. On the addition of hydrochloric acid, a reaction occurs which results in the precipitation of the greater part of the sulphur.

$$\underset{\text{Unchanged Sulphide.}}{2CaS} + \underset{\text{Hyposulphite of Calcium.}}{CaS_2O_3} + 6HCl = \underset{\text{Chloride of Calcium.}}{3CaCl_2} + \underset{\text{Water.}}{3H_2O} + \underset{\text{Sulphur.}}{2S_2}$$

Native sulphur is purified by distillation into receivers in which it condenses in the liquid state. Solidified in moulds it forms "roll sulphur." To obtain "flowers of sulphur" the vapour is passed into a brickwork chamber in which, in consequence of being cooled suddenly, it is reduced at once to the solid form.

Sublimed sulphur under the microscope will be found to consist of translucent globules which consist of crystals radiating from a centre. Except that it is crystalline, sublimed sulphur agrees in most respects with milk of sulphur.

The impurities which the B. P. tests are intended to provide against are chiefly sulphurous acid and sulphide of arsenic. [§ Does not redden moistened litmus paper. Solution of ammonia, agitated with it, and filtered, does not on evaporation leave any residue.]

Sulphur in its ordinary state is a yellow brittle solid, fusible, volatile, inflammable in the air, soluble in bisulphide of carbon, and in hot benzol and oil of turpentine. Heated to fusion, it solidifies on cooling to a mass of brownish translucent prismatic crystals which rapidly change back again into the ordinary or octahedral form. When melted sulphur is heated considerably above its fusing point, it becomes extremely viscid, and retains this character if suddenly cooled. This plastic form of sulphur is insoluble in bisulphide of carbon, but recovers the crystalline soluble condition in a short time. Sulphur may be made to assume several other "allotropic" forms, which, however, are of less interest.

In most of its combinations sulphur exhibits a bivalent or dyad character, *e.g.*

$$\left.\begin{matrix}H\\H\end{matrix}\right\}S \qquad \left.\begin{matrix}H\\K\end{matrix}\right\}S \qquad \left.\begin{matrix}K\\K\end{matrix}\right\}S \qquad Fe''S$$

Oxides of Sulphur.		Corresponding Acids.
Hydrosulphurous (Schutzenberger)		H_2SO_2
Sulphurous	SO_2	H_2SO_3
Sulphuric	SO_3	H_2SO_4
Hyposulphurous or Sulpho-sulphuric		H_2SSO_3
Disulphuric or Nordhausen sulphuric		$H_2S_2O_7$
Dithionic		$H_2S_2O_6$
Trithionic		$H_2S_3O_6$
Tetrathionic		$H_2S_4O_6$
Pentathionic		$H_2S_5O_6$

There are two compounds of sulphur with hydrogen, corresponding to water and peroxide of hydrogen respectively.

Sulphuretted hydrogen or Hydrosulphuric acid	H_2S
Persulphide of Hydrogen	H_2S_2

With carbon sulphur unites directly at a bright red heat, producing carbon disulphide CS_2, the analogue of carbon dioxide CO_2.

With chlorine, bromine and iodine there are several compounds. Of these, S_2Cl_2 and S_2I_2 are employed in medicine. The former is obtained by passing chlorine over sulphur, and the preparation known as "hypochloride of sulphur" consists of flowers of sulphur impregnated with a small quantity of this compound.

In many compounds sulphur officiates as the representative of oxygen. We have, for instance,

H_2S	corresponding	to	H_2O
H_2S_2	,,	,,	H_2O_2
KHS	,,	,,	KHO
CaS	,,	,,	CaO
CS_2	,,	,,	CO_2
K_2CS_3	,,	,,	K_2CO_3
K_3AsS_4	,,	,,	K_3AsO_4
$KCNS$	,,	,,	$KCNO$
C_2H_5HS	,,	,,	C_2H_5HO

On the other hand, sulphur seems in a few cases to represent carbon. The sulphites, for example, resemble the carbonates, and are generally isomorphous with them.

SO_2	corresponds	to	CO_2
K_2SO_3	,,	,,	K_2CO_3
$KHSO_3$	,,	,,	$KHCO_3$
$MgSO_3$	,,	,,	$MgCO_3$

Sulphuris Iodidum.—Four ounces of iodine and one ounce of sulphur are mixed and melted together in a flask.

The compound possesses very nearly the composition represented by the formula S_2I_2.

Two atoms of iodine	$= 127 \times 2$	$= 254$
Two atoms of sulphur	$= 32 \times 2$	$= 64$

These are nearly the proportions employed by the Pharmacopœia.

The compound gradually loses iodine when kept exposed to the air.

IRON REDUCED BY HYDROGEN.

BY PROFESSOR G. DRAGENDORFF,

(*Dorpat, Russia.*)

It is well known that the preparation bearing this name, as it is found in the market, frequently contains large proportions of triferrotetroxide; nay, that it occasionally consists of this exclusively, so that it yields no effervescence in contact with diluted acids. Sometimes, even when diluted acids develope hydrogen, greyish-black, rounded masses, may be separated from the powder by a sieve, easily recognizable as the above mentioned oxide. The explanation of its presence has long ago been given; a portion of the iron, after reduction, taking up oxygen from the air, while another portion of the oxide may be derived from the incomplete decomposition of the ferric oxide. The first occurs when the iron has not been sufficiently heated during its reduction; the latter, when the supply of hydrogen has been insufficient for perfect reduction.

To obtain a preparation not disposed to the re-absorption of oxygen, I conduct the reduction in an iron tube of an internal diameter of 1·4 inch, heated in a small Paris muffle to a bright white heat, by means of coke and charcoal. Such a furnace, useful also to the goldsmith, should not be wanting in any pharmaceutical laboratory. Connected, by means of a stovepipe, with a well-drawing chimney, sufficient heat can be produced in this furnace to melt silver and copper.

To heat tubes, I cut circular holes in opposite sides of the furnace, into which holes the tubes are placed after the removal of the muffle. In doing other work these holes are closed by means of iron plugs lined with clay.

Another objectionable feature of the commercial ferrum redactum, is the amount of sulphur it contains. It must be conceded that, if the product is to have any advantage over the ordinary powdered iron, it must consist in its freedom from carbon and sulphur, so as to dissolve in the stomach without the development of hydrogen charged with hydric sulphide and carbide. The exhibition of so expensive a preparation as the ferrum redactum, becomes inadmissible when it contains ferrous sulphide, and developes the hydric sulphide upon dissolving. The almost universal existence of this iron contaminated with ferrous sulphide, is best shown by the assertion of one of the largest manufacturers in Berlin, Mr. Schering: "I have never yet succeeded in producing an iron, reduced by hydrogen, free from sulphur."

I would say, that ten years ago such a preparation, free from sulphur, had been prepared in my laboratory by way of experiment; and I take the liberty of publishing my formula for the same, which increases its cost a trifle over the old method.

If we inquire into the origin of the ferrous sulphide in the reduced iron, we may trace it to two different sources, namely, 1. The ferric oxide used for the reduction may be contaminated by sulphates; and 2. The hydrogen employed in the reduction may have contained hydric sulphide.

As to the first point, it is well known how greatly the precipitate of ferric hydrate is inclined to carry down other substances present in the solution. If the precipitate, as frequently happens now, is produced by contact of ferric sulphate with sodic carbonate or with ammonia, it will invariably contain basic sulphate that cannot be removed by simple washing. Even a ferric hydrate precipitated from ferric chloride may contain sulphates, if the muriatic or nitric acids employed in the preparation of the former contained sulphuric acid, or if the sodic carbonate employed in the precipitation contained sulphate.

The sulphate contaminating the precipitate is reduced by the hydrogen to sulphide.

Secondly, it is well known that hydrogen produced by the action of dilute sulphuric acid upon zinc, may be contaminated with hydric sulphide if the temperature during its development surpasses 30° C. This hydric sulphide is generated by the reduction of the sulphuric acid by means of the nascent hydrogen; the former undergoes such a decomposition into sulphur and hydric sulphide under various other conditions.

These observations at once point out the conditions requisite for the production of a pure ferrum redactum, namely, the employment of ferric oxide free from sulphates, and of hydrogen free from hydric sulphide.

The first I obtain by heating ferrous oxalate in an iron dish with access of air: the oxalate is produced by precipitation of ferrous chloride with neutral potassic oxalate; and the ferrous chloride is made by dissolving iron nails in pure muriatic acid.

During the disengagement of hydrogen the vessel is to be placed in cold water, the sulphuric acid being diluted with eight parts of water. Should the reaction cease, dilute, but never concentrated, sulphuric acid should be added. The hydrogen is next passed through two tubes, one of which is filled with small pieces of pumice-stone, moistened with a solution of plumbic nitrate, and the other with pieces of potassic hydrate. I must add, that by passing the hydrogen over hot ferrous oxalate I obtained pure iron; but the other method is generally preferable for the preparation of ferrum redactum,—first, because, in the shape of the compact oxide, more iron can be placed in the tube than when the ferrous oxalate is used; and secondly, because I fear, though it has not occurred to me in practice, that during careless operations part of the carbon derived from the oxalate may remain behind as ferrous carbide. The latter subjected to the action of acid would again develope badly-tasting hydrogen.—*The Chicago Pharmacist.*

PHARMACOGNOSTICAL NOTES.—AMERICAN INDIGENOUS PLANTS.

BY JOHN M. MAISCH.*

Many interesting questions connected with the United States indigenous materia medica require investigation, and it is in most cases not easy to obtain the desirable information. The various inquiries instituted within the past few years, in different sections of the States, into the statistics of this branch of the drug trade have resulted in total failures; and, except to the initiated, very little is known of the localities where many of the staple articles of the indigenous materia medica are collected for the general commerce, the information being usually limited to the geographical section of the country. The difficulties encountered in such investigations have been well pointed out by Mr. C. Lewis Diehl, in a paper published in the Proceedings of the American Pharmaceutical Association, 1870, p. 137. The knowledge we possess on this particular point appears merely to indicate that the wholesale market has now to depend on the Southern, South-Western and Western States for a supply of drugs which were formerly supplied in sufficient quantities by the Eastern and Middle States. While this may undoubtedly be in part accounted for by the increased demand, it must be also to some extent due to injudicious collection, whereby some medicinal plants have become nearly or entirely extinct in certain localities where formerly they were frequently met with.

The same cause appears to have had already similar results in some Western localities. In Professor Diehl's paper, cited above, we find the following passage, which seems to point in this direction:—"Formerly there was a lively trade in indigenous drugs in New Albany, Ind. (gathered among a range of hills known as 'the Knobs'), but such is not now the case, and the drugs gathered in its neighbourhood find their markets no further than our city (Louisville, Ky.)." Apparently the same wasteful practice, satisfied with the results of to-day, without looking to the demands of the morrow, prevails among the drug gatherers of North as in South and Central America, and it is not improbable that the time may not be far distant when a few of the leading drugs may require to be cultivated to ensure a full and continuous supply of the market.

Although many of the indigenous plants have been used in domestic and in regular practice, the use of some seems to be confined altogether to certain localities, beyond which their medicinal properties are unknown or not appreciated. It would be very interesting to obtain reliable information concerning them.

The following notes are intended to direct attention to a few articles of the indigenous materia medica, nearly all of which deserve to be further investigated:—

Cypripedium.—The secondary list of the Pharmacopœia of the United States directs the rhizome and rootlets of *Cypripedium pubescens*, Willdenow. Under the common names of ladies' slipper and American valerian, two entirely distinct rhizomes, with the rootlets attached, are met with in commerce, both of monocotyledonous origin. The only species of this genus which I have met with in the neighbourhood of Philadelphia is *Cypripedium acaule*, Aiton, the radical portion of which has not been observed by me among the commercial ladies' slipper root. The officinal species appears to grow as far south as Georgia, and west to Wisconsin. Gray † states that it is common northward and westward, and southward in the Alleghanies. Dr. Porcher ‡ says it occurs near New-

* Read before the Philadelphia College of Pharmacy, April 16th.

† 'Manual of the Botany of the Northern United States.'

‡ 'Resources of the Southern Fields and Forests, p. 603.'

born. Dr. Darlington * mentioned, twenty years ago, that it was formerly frequent in Chester county, Pa., and it is probable that the plant is now of rarer occurrence yet.

Another species, which, like the one mentioned, bears flowers with yellow lips, is *Cypripedium parviflorum*, Salisbury, which appears to be most common west; though usually smaller than the former, it attains the height of 1 to 2 feet, the two species appearing to pass into each other (Gray). *Cypripedium candidum*, Muhlenberg, and *C. spectabile*, Swartz, both with white-lipped flowers, occur mainly in the Alleghanies and west thereof, and it is not impossible that they may furnish a portion of the commercial root, while *C. arietinum*, R. Brown, the smallest species, occuuring in Canada and the northern border States, is probably not collected.

For a number of years past I have been endeavouring to procure the four species first mentioned, with root and flowers, but have been unsuccessful. Mr. F. C. Weber, while at New Albany, Ind., last year, tried to aid me in my endeavours, and obtained from an old herbalist there the information that *C. pubescens* and *parviflorum*, both of which plants he described correctly, are collected there indiscriminately. At Mr. Weber's request, he collected one plant with the roots and the green fruit, the only one, he stated, he could find, which he palmed off as the first-named species, but which was promptly recognized by me as *Uvularia perfoliata*, L. This deception was doubtlessly purposely attempted.

No better success attended my inquiries of dealers in indigenous drugs, who appear to sell these goods without questioning their identity, relying upon the statements of the Western collectors. The only way to arrive at correct results is to have complete specimens of the different species collected, so that their roots may be compared with the commercial article.

Cephalanthus occidentalis, L., *Rubiaceæ*, button-bush, or pond-dogwood, is a shrub 5 to 10 feet high, common throughout Canada and the United States in swamps and on the margin of ponds and brooks. The bark has been repeatedly recommended as an expectorant useful in consumption, but I believe has been abandoned, though it may be used yet as a domestic remedy. Last fall a sample of the bark, with a flowering branch, was received from Texas, where a gentleman claimed that the bark had wonderful curative properties; of what character was not stated. If we may judge from the slight bitter taste, which is destitute of acridity, it may probably possess tonic properties.

Ilex Cassine, L., *Aquifoliaceæ*, grows near the coast from Virginia southward, and is known there under the names of cassena, yeopon, yupon or yaupon. It appears to have been held in high repute by the aborigines, and to be still used to a considerable extent near the North Carolina coast.

Dr. Porcher† states that the Creeks employed it, according to Elliott, at the opening of the councils sending to the seacoast for a supply; they considered it one of their most powerful diuretics. The inhabitants of North Carolina purify brackish water by boiling in it cassena leaves. In North and South Carolina much use is made of the leaves for making tea. The leaves act as a powerful diuretic, and are employed in calculous, nephritic diseases, diabetes, gout and small-pox. The so-called black drink of the Indians, which in its effects resembled opium, was believed by some to have been made from these leaves, but by other writers is referred to various unknown roots.

In a letter written three years ago, Mr. Chas. K. Gallagher, of Washington, N.C., to whom I am indebted for some of the leaves, states that they are used extensively along the eastern coast of that State, and that they are cured for use by heating in ovens with heated stones, and constantly stirring during the process, as practised by the Indians.

The cassena is an evergreen shrub, attaining a height of 10 to 15 feet; the leaves are alternate, coriaceous, short petiolate, about an inch long, varying in shape from roundish oval to lanceovate, obtuse and slightly emarginate, crenate with a minute spine inserted near the base of each crenature, smooth on both sides and shining above; their taste is mildly astringent and tea-like, scarcely bitterish.

It would be very interesting to ascertain whether cassena contains caffeine, like the so-called Paraguay tea, which is obtained from *Ilex paraguayensis*, Lamb.

Artemisia Ludoviciana, Nuttall, *Compositæ*, was sent to me two years ago, from Kansas, where a package of it had been received by an army officer from Colorado, with the statement that it would "make the hair grow," if applied in a state of infusion. The plant is indigenous to North America, and grows from the shores of Lake Huron and Michigan south-westward to Missouri and westward to the Pacific Ocean. It is from two to four feet high, branched; leaves lanceolate, sessile and entire above, the lower variously toothed, canescent on both sides, with a dense, closely adpressed wool; heads small, ovoid, nearly sessile, crowded in dense, somewhat leafy panicles; receptacle smooth. The odour reminds of wormwood, but is much weaker; the taste is similar, though but slightly bitter.

The plant has probably tonic properties, but appears not to deserve a place alongside the numerous bitter aromatic tonics at the present time medicinally employed.

Pycnanthemum linifolium, Pursh., *Labiatæ*, in some places called Virginia thyme, was sent to me a year or two ago, as the remedy successfully used by an empiric in Montgomery county, Pa., in cases of hydrophobia. It is hardly credible that this plant could be of any value in this fearful disease, possessing, as it apparently does, merely somewhat stimulating and diaphoretic properties, like most species of this order, in consequence of the small quantity of volatile oil which it contains. It is smooth throughout, about 1½ to 2 feet high, with the linear and sessile leaves ½ to 2 inches long, rigid, entire, three-nerved, often crowded in small axillary fascicles; the branches are erect and form a rather dense corymb; the flowers terminate the branchlets and are crowded into hemispherical heads, supported by imbricated ciliate bracts, which, like the awl-shaped calyx teeth, are rigid and sharply pointed; corolla whitish or pinkish, dotted on the inside.

Pycnanthemum incanum, Michaux, mountain mint or wild basil, is also called horsemint in some countries of Pennsylvania where *Monarda punctata*, L., does not occur, in place of which it is used. The two plants are easily distinguished, the bracts of the former being linear, almost subulate, while those of the *Monarda* are leaf-like, and of a yellow and reddish colour. The medicinal properties of both are probably identical.—*American Journal of Pharmacy.*

* 'Flora Cestrica, 3rd. edition, 1853, p. 316.'
† 'Southern Fields and Forests,' p. 431.

CONTRIBUTIONS TO THE HISTORY OF THE OPIUM ALKALOIDS.

BY C. R. A. WRIGHT, D.SC.

Lecturer on Chemistry in St. Mary's Hospital Medical School.

(*Continued from page* 922.)

II. *Action of Hydrochloric Acid on the Polymerides of Codeia.*

(*a*). *Tetracodeia.*—Tetracodeia hydrochlorate was boiled for six hours with a large excess of strong HCl; no perceptible evolution of methyl chloride took place; and on examining the resulting product no change was found in the ratio of carbon to chlorine. Hence no substitution of Cl for OH had taken place, and apparently no action at all had ensued.

(*b*). *Tricodeia.*—Tricodeia hydrochlorate was heated to 100° for $1\frac{1}{4}$ hours with a large excess of strong HCl; on adding water to the product, a tarry substance was precipitated, whereas the original tricodeia hydrochlorate is readily soluble in dilute HCl; precipitated by Na_2CO_3, and the precipitate exhausted with ether, a a viscid non-crystalline hydrochlorate was obtained on agitation of the ethereal extract with HCl. The reactions of this product appear to be identical with those of tricodeia, excepting that the reddish-purple tinge with Fe_2Cl_6 appears instantaneously instead of only after standing a short time. Dried at 100°,

0·3070 grm. gave 0·756 CO_2 and 0·185 H_2O.
0·2480 „ 0·1150 AgCl.

	Calculated.		Found.
C_{108}	1296	68·03	67·16
H_{120}	120	6·30	6·69
Cl_6	213	11·18	11·48
N_6	84	4·41	
O_{12}	192	10·08	
$C_{108}H_{114}N_6O_{12},6HCl$	1905	100·00	

Hence this product has been formed by the reaction

$$C_{108}H_{126}N_6O_{18},6HCl = 6H_2O + C_{108}H_{114}N_6O_{12},6HCl,$$

and has the composition of a polymeride of "apocodeia." From the great similarity observed between this product and "apocodeia" made by Matthiessen and Burnside's process,* it appears probable that the product of the action of zinc chloride on codeia is a mixture of bodies of general formula $(C_{18}H_{19}NO_2)n$ nHCl, in which the derivative where n=6 greatly predominates; experiments on the action of zinc chloride on morphia now in progress in conjunction with Herr L. Mayer indicate that mixtures are obtained in this case also.

(*c*.) *Dicodeia.*—When pure dicodeia hydrochlorate is heated to 100° for one hour with a large excess of HCl, a change is produced expressible by the equation

$$C_{72}H_{84}N_4O_{12},4HCl + HCl = C_{72}H_{83}ClN_4O_{11},4HCl + H_2O,$$

which shows that the formula of this polymeride contains at least C_{72}. Na_2CO_3 throws down from the product a voluminous white precipitate, which differs in appearance slightly from that of dicodeia, and turns green by exposure to air; ether dissolves this precipitate, and on agitation with HCl a viscid hydrochlorate is obtained which does not crystallize, but dries up to a gum. Fe_2Cl_6 gives a brown-purple tint, NO_3H a blod-red, and

$$K_2Cr_2O_7 + SO_4H_2$$

a lighter blood-red, none of which reactions occur with the original dicodeia. Dried at 100°,

0·3200 grm. gave 0·737 CO_2 and 0·189 H_2O.
0·3260 „ 0·172 AgCl.

	Calculated.		Found.
C_{72}	864	63·50	62·82
H_{87}	87	6·39	6·56
Cl_5	177·5	13·04	13·06
N_4	56	4·12	
O_{11}	176	12·95	
$C_{72}H_{83}ClN_4O_{11},4HCl$	1360·5	100·00	

III.—*Action of Hydriodic Acid and Phosphorus on the Polymerides of Codeia.*

(*a*). *Dicodeia.*—When pure dicodeia is dissolved in a large excess of strong hydriodic acid (55 per cent. HI) and heated, together with a piece of phosphorus, to ebullition until the boiling-point rises to 120°, methyl iodide is given off and a considerable quantity of phosphoric acid formed. The product, filtered through asbestos and precipitated with water, yields snow-white flakes that become yellow by exposure to air, and melt to a colourless oil at 100° when moist, although they do not fuse at that temperature when thoroughly dried. Dried at 100°,

0·3155 grm. gave 0·5620 CO_2 and 0·1460 H_2O.
0·1895 „ 0·1190 AgI.

	Calculated.		Found.
C_{136}	1632	48·45	48·58
H_{161}	161	4·78	5·14
I_9	1143	33·94	33·92
N_8	112	3·33	
O_{20}	320	9.50	
$C_{136}H_{153}IN_8O_{20},8HI$	3368	100·00	

Hence this substance is formed by the reaction—

$$2C_{72}H_{84}N_4O_{12},4HI + 20HI =$$
$$= I_8 + 4H_2O + 8CH_3I + C_{136}H_{153}IN_8O_{20},8HI.$$

The physical properties of this substance are almost identical with those of the bodies of analogous constitution (containing C_{136}) formerly obtained from both codeia and morphia; carbonate of sodium throws down a precipitate almost insoluble in ether, showing that polymerization to the tetra-series has taken place; agitated with a large bulk of ether, this precipitate furnishes an extract, which, on agitation with dilute nitric acid and boiling with $AgNO_3$ and NO_3H of the nitrate thus obtained, yields a precipitate of AgI, showing that iodine is contained in the precipitated base, The substance itself boiled with $AgNO_3$ and HNO_3 produces a deep orange-coloured liquid, intermediate in tint between the blood-red produced by the derivatives of polymerized $C_{17}H_{19}NO_3$, and the deep yellow by those of polymerized $C_{17}H_{21}NO_3$, a result confirmatory to some extent of the formula deduced from the analysis, this being capable of representation as—

$$8(C_{17}H_{20}NO_3) + 9HI - 4H_2O.$$

From this it appears pretty evident that the formulæ hitherto attributed to the tetra bases (containing $C_{68} - C_{72}$) are only half the true ones, which contain $C_{136} - C_{144}$.

(*b*). *Tetracodeia.*—On treating tetracodeia in the same way and continuing the ebullition until the temperature reaches 130°, a brown syrupy liquid is finally obtained, which yields, on filtration through asbestos and precipitation with water, a yellow brittle tar not fusible at 100° when quite dry; methyl-iodide is produced in quantity during the action, but only traces of phosphoric acid, and this probably by atmospheric oxidation. Dried at 100° the tar gave these numbers:—

0·3660 grm. gave 0·621 CO_2 and 0·149 H_2O.
0·5520 „ 0·363 AgI.

	Calculated.		Found.
C_{136}	1632	46·31	46·27
H_{158}	158	4·48	4·53
I_{10}	1270	36·04	35·54
N_8	112	3·18	
O_{22}	352	9·99	
$C_{136}H_{150}I_2N_8O_{22},8HI$	3524	100·00	

Hence this substance is formed by the reaction—

$$C_{144}H_{168}N_8O_{24},8HI + 10HI =$$
$$= 8CH_3I + 2H_2O + C_{136}H_{150}I_2N_8O_{22},8HI.$$

NO_3H and $AgNO_3$ give a blood-red colouration with this product, showing, as the analytical numbers indicate, that it is derived from polymerized $C_{17}H_{19}NO_3$, and not from polymerized $C_{17}H_{20}NO_3$, or $C_{17}H_{21}NO_3$.

The foregoing results show that the methyl group in codeia is unaltered during the polymerization to dicodeia and to tetracodeia, and furnishes another proof of the conclusion come to in Part IV., § 2, that the addition

* Proc. Roy. Soc., vol. xix. p. 71.

of H_2 for C_{17}, when HI and P act on morphia or codeia, takes place *before*, and not after, the final polymerization; even polymerization to dicodeia could not precede this addition of of H_2, as the product obtained from that polymeride has only H added on for C_{17}.

The following formulæ show clearly the difference in the action of hydriodic acid and phosphorus on codeia and its polymerides.

Alkaloid.	Temperature.	Formula of Product.
Codeia ...	100°	... $8(C_{17}H_{19}NO_3+H_2)+12HI$.
,, ...	110°–115°	... $8(C_{17}H_{19}NO_3+H_2)+12HI-4H_2O$.
,, ...	up to 130°	... $8(C_{17}H_{19}NO_3+H_2-O)+12HI-4H_2O$.
Dicodeia	up to 120°	... $8(C_{17}H_{19}NO_3+H)+9HI-4H_2O$.
Tetracodeia	up to 130°	... $8(C_{17}H_{19}NO_3)+10HI-2H_2O$.

From which it is clear that dicodeia is intermediate between tetracodeia and ordinary codeia. From the fact that 4HI for 8 (C_{17}) are added on in the case of the first product *before* the elimination of $4H_2O$, as in the second substance in the list, it may be inferred that the action is not a true substitution of iodine for hydroxyl; analogous facts have been observed in the chlorinated substances obtained by the action of HCl on codeia and morphia, the first action being apparently a direct *addition* of the elements of HCl, the subtraction of the elements of H_2O taking place at a later stage.

PHENOMENA ASSOCIATED WITH THE HYDROGEN FLAME.

BY W. F. BARRETT.

In a recent number of 'Nature,' * Mr. W. F. Barrett has recorded some extremely interesting researches upon some phenomena associated with the hydrogen flame, one of the results of which appears to be that the statement current in the manuals of chemistry, that hydrogen burns with a blue flame, will in future have to be altered. The following is a sketch of some of the phenomena met with, but we must refer our readers to the paper itself for further details and the conclusions which the author draws from his experiments.

For the purpose of studying these phenomena free from disturbing causes, Mr. Barrett recommends that the gas should be purified by passing into a gasholder through a solution of potash, and then through a solution of perchloride of mercury or nitrate of silver; that it should be conducted to a platinum, or, preferably, a steatite jet, through red or black india-rubber tubing, and that it should be burnt in a perfectly dark room, amid calm and dustless air. The flame so obtained is a faint reddish-brown colour, invisible in daylight, but in a dark room showing a stream of luminosity more than six times longer than the flame of the burning hydrogen.

In many cases, when solid bodies, such as marble, chalk, granite, gypsum, etc., are brought into contact with the flame, phosphorescent effects are produced. Sand-paper gives a vivid green phosphorescence, showing a perfect section of the hollow flame, and lasting several seconds. No such effect is produced by coal-gas or olefiant or marsh-gas, but oxygen given through coal-gas shows it well.

One remarkable phenomenon, which has been studied also by M. Wurtz, is the deep blue and glowing image, the exact size and shape of the hollow flame, that instantly appears upon such an object as a white plate or block of marble when brought into contact with the flame. This effect ceases immediately upon the removal of the flame; it also becomes less distinct, and finally ceases, if the flame be directed repeatedly to the same spot. After many experiments, Mr. Barrett arrived at the conclusion that this phenomenon was in every case due to the presence of sulphur. It does not occur when a chemically clean surface is used. After such a surface has been exposed a short time to London air, which contains sulphate of ammonia, it is produced; but not when the surface is simply exposed to country air, or kept under cover. To sulphur, indeed, arising from various sources, such as vulcanized tubing or the decomposition of the sulphuric acid, he attributes the blue colour generally associated with the hydrogen flame.

As an instance of the delicacy of the hydrogen flame as a test for detecting the presence of sulphur, Mr. Barrett states that although pure precipitated silica gives no blueness with the flame, yet if one grain of milk of sulphur be mixed with five hundred grains of silica, and one-hundredth of a grain of this mixture be thrown on the surface of pure water or chemically clean platinum foil, the blue colour is produced upon bringing the hydrogen flame in contact with it. The fingers, too, immediately after washing, show no colour if brought for a moment into the flame; but if they touch a white india-rubber tube ever so lightly, they will show a vivid blueness, and any substance with which they come in contact will show traces of it. Some sulphates and sulphides,—sulphate of ammonium or alum, for instance,—show the blueness, and are evidently decomposed by the flame; sulphate of soda does not. Sulphuric acid gives a splendid brilliant and persistent blue.

The presence of the least trace of phosphorus is revealed by the production of a vivid green light. Tin and its alloys give a fine scarlet colour; or if there be a trace of sulphur, a lovely purple. If phosphorus also be present, there may be obtained a green belt encircling a rich blue, then a purple zone, and finally a glowing scarlet at the root of the flame. These colours are not imparted to the flame, but occur on the surface; neither are they produced when the combustion of the hydrogen is complete, as in the upper part of the flame.

With gases, the result is different, the whole flame being tinged with the colour imparted to it. A mere trace of hydrochloric acid gas imparts a reddish brown colour; ammonia imparts a yellow colour, and burns freely. Carbonic acid gives a lilac tinge, probably due to its decomposition, and the production and combustion of carbonic oxide.

The author thus briefly sums up the results of his experiments:—

"1. That the combustion of hydrogen exhibits some physical peculiarities, and produces phosphorescence on many substances with which it comes in contact.

"2. That the blueness so often seen in a hydrogen flame is due to the presence of sulphur, derived either from the vulcanized rubber tubing, or from atmospheric dust, or from the decomposition of the sulphuric acid spray from the generator.

"3. That a flame of hydrogen forms an exceedingly delicate re-agent for the detection of sulphur or phosphorus, and possibly also of tin.

"4. That many sulphates, and also carbonic acid, are apparently decomposed by a hydrogen flame.

"5. That a hydrogen flame is further a test for the presence of some gases, notably carbonic acid.

"6. That these results are capable of practical application."

* 'Nature,' April 18th, 1872, p. 482.

METROPOLITAN CHEMISTS' DEFENCE ASSOCIATION.

The business of the above Association was finally concluded on Wednesday last, at the Covent Garden Hotel, by the presentation of an elegant work of art to Mr. E. B. Vizer. The following inscription, borne on one of its panels, expresses the feelings of its donors:—

"Presented to E. B. Vizer, Esq., by his fellow committeemen of the Metropolitan Chemists' Defence Association, and a few friends, as a trifling acknowledgment of his efficient services as Secretary."

It was at first intended to limit the list of contributors strictly to the members of the committee; but a few other gentlemen, who had come into contact with Mr. Vizer, and who greatly appreciated his character and his labours, had insisted on being permitted to add their names.

The Pharmaceutical Journal.

SATURDAY, JUNE 8, 1872.

Communications for this Journal, and books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

SCIENCE IN ENGLAND.

OF the hundreds of thousands who overran the downs at Epsom last week, or the millions for whom the exciting events of the Derby Day have an all-absorbing interest, probably not half-a-dozen were even aware, or would have cared a button if they had been told, of the different kind of festival which was being held in the metropolis on Thursday evening, when the FARADAY Lecture was delivered in the theatre of the Royal Institution.

When FARADAY died, the Chemical Society instituted a lecturership to be held during three years by some foreign chemist of distinction, under the sole condition that he should deliver during his tenure of office a discourse upon some branch of chemistry, or upon some topic relating to chemistry, to be determined upon by himself. Three years ago the inaugural lecture was given by DUMAS, and a finer piece of eloquence was probably never listened to. His speech, however, possessed more of the character of a funeral oration, pronounced as it was within a comparatively short period of the death of the great philosopher. No more appropriate place could have been selected for its delivery than the theatre of the Royal Institution, within the walls of which all FARADAY'S great discoveries had been accomplished.

On the present occasion Professor CANNIZARO, of Palermo, was the lecturer, and received the FARADAY Medal.

The subject he had selected, "The Teaching of Chemistry in the Universities," was one which, at the present time, possesses considerable interest as bearing in an important degree upon the progress of Science in Great Britain.

Dr. FRANKLAND in his presidential address to the Chemical Society, and in evidence before a Royal Commission, has lately been complaining bitterly of the decline of scientific discovery in England. He attributes it in great part to the fact that in the examinations for degrees in Science in the English Universities, candidates are not required to give evidence of having performed original work, or of possessing special aptitude for this kind of study. In making these sweeping statements, however, we consider that Dr. FRANKLAND is not doing justice to the Universities, and especially the University of London, which has been labouring earnestly and successfully for years past to elevate the character of the science teaching in this country. Moreover, it seems to us that he by no means strikes at the real root of the evil. It is true that there has been for some time past but little activity in the prosecution of chemical research, and that the number of papers published annually by the Chemical Society is far from proportionate to the increased number of Fellows. But the fault does not lie with the younger chemists, who, as a rule, are fully occupied with the pressing business of getting a living, and have little or no leisure, however much their inclination may be, to devote to pure, which means unremunerative, science. The blame attaches to those men who, occupying high positions, with ample means and abundant leisure if they choose to make it, yet allow themselves to be wholly absorbed by pursuits for which other men would be equally well adapted. They thus not only do not themselves contribute to the advancement of science, but set before their juniors the baneful example of that "ambition of preferment for its gold" by which the whole scientific community is demoralized.

We by no means question the right of every one to the exercise of his abilities in the manner he chooses; but at the same time we hold that this right is limited by the obligations attaching to the higher offices which are attainable by scientific men, and we consider it to be the duty of those holding prominent and lucrative positions to sustain and justify their pre-eminence as representative men by continued research and contribution to the advancement of science.

From another point of view, this duty is especially incumbent upon all chemists holding the position of teachers. In nine cases out of ten, the man who does no experimental work does not read. He thus knows nothing of the progress of science; and, exhibiting none of that enthusiasm which is above all things essential to secure the attention of an audience, he is unable to maintain the interest of his pupils in the subject he pretends to teach. On the Continent, and particularly in Germany, it is otherwise. There the publication of original memoirs by a professor is almost a condition of his retaining his chair; and certainly a want of activity in this respect would influence very seriously his social position as well as his professional career.

FARADAY, in honour of whose memory the assembly of Thursday evening was met together, spent his life in searching out the secrets of nature. It was enough for him that he possessed necessaries; pleasures and luxuries he looked for in his work, and who shall say that he did not find them?

Transactions of the Pharmaceutical Society.

MEETING OF THE COUNCIL.

June 5th, 1872.

Present—Messrs. Atherton, Baynes, Betty, Bottle, Brown, Frazer, Hampson, Haselden, Hills, Owen, Radley, Sandford, Savage, Schacht, Shaw, Stoddart, Sutton, Urwick and Williams.

Mr. A. F. Haselden was called to the chair, and took the same accordingly.

The minutes of Council of the 1st and 15th ult. were read and confirmed.

In reply to a question by Mr. Sutton respecting the re-admission of members on payment of subscriptions in arrear, the Secretary said that a circular was sent to all local secretaries about the middle of April, asking for a list of those who had not paid, and accompanied by an extract from the bye-laws. He should much like the accounts of all local secretaries with him to be settled up to the end of March; so that he could then see who were in arrear, and communicate with them direct; and there would be no excuse for members saying they had not had notice. It happened sometimes that local secretaries delayed sending up the subscriptions, and, in consequence, he occasionally got into trouble through applying for subscriptions which had been already paid. He should, therefore, prefer that the local secretaries and collectors cease to receive subscriptions at the end of March, and that the responsibility of collecting the arrears should be left with him.

Mr. Sutton said he, as a local secretary, declined to collect subscriptions, as it took a greal deal of time, and sometimes caused dissatisfaction.

The Secretary said he thought local secretaries might be relieved of some of their duties, particularly that of applying for subscriptions.

Mr. Atherton thought it would be a good plan to request members to forward their subscriptions by a certain date to the local secretary.

The Secretary said he should have no objection to this, if the Council approved.

Election of Officers.

The election of President for the ensuing year was then proceeded with by ballot, the result being that Mr. A. F. Haselden was re-elected unanimously.

Mr. Haselden said: Gentlemen, having again been unanimously elected to be your President, I must say the confidence therein implied is particularly gratifying to me, not so much for the honour itself, although I am a little proud of it, as for the handsome manner in which you have conferred that honour. Permit me to say that whatever success I may have attained during the past year as your Chairman, has been greatly due to the kindness, consideration and support which I have at all times received from you. Under similar conditions I trust that I may be able to fill the chair for another year with satisfaction to you and credit to myself.

Mr. Wm. Scott Brown, of Manchester, was elected Vice-President. He said he should have much preferred the selection should have fallen upon some one else, as he feared he might not be able to attend with sufficient regularity; but feeling that, whilst Mr. Haselden had health and strength, his position would be simply an honorary one, he had much pleasure in accepting the compliment.

Mr. Thos. Hyde Hills was unanimously re-elected Treasurer.

Elias Bremridge was reappointed Secretary and Registrar, and Richard Bremridge, Assistant-Secretary and Deputy-Registrar.

Elections.

Honorary Members.

The following gentlemen were elected Honorary and Corresponding Members of this Society:—

Professor John Hutton Balfour, of Edinburgh.
Professor A. Crum Brown, of Edinburgh.
Professor Friedrich August Flückiger, of Bern.

Members.

The following registered chemists and druggists were elected members of the Society:—

Alcock, Walter.............Sheffield.
Beaumont, Charles F. J. B..St. Mary Cray.
Fitch, William Bowers ....74, Edgware Road.
Grime, Thomas............Over Darwen.
Heathcoat, Thomas.........West Hackney.
Johnson, Joseph ....Kilburn.
Shepherdson, Welburn......Hull.
Steel, Thomas.............Barrow-in-Furness.

On the question being put whether any member of Council were acquainted with a gentleman who had applied for membership, some discussion arose as to the mode of electing members.

Mr. Radley said he had heard complaints by examined members that others had been admitted to membership who were not properly qualified. Two or three gentlemen had been elected in a town with which he was acquainted, who had not served their apprenticeship, and who were not generally recognized by their fellow-townsmen as genuine chemists and druggists. A short time ago he had been requested by a wholesale house to recommend a man for election of whom he knew nothing; and on inquiry, he found that he had not been apprenticed, but had been a working man who had got on, and gone into the business. He suggested that when the names of country gentlemen were proposed, the Local Secretary should be written to, and he would, no doubt, be able to obtain reliable information as to the position and character of the person named. There were many men who would be very glad to pay the entrance fee and subscriptions for the privilege of calling themselves members of the Society.

The President said that by the Act of 1868, under certain conditions, chemists and druggists who had been in business before that date became eligible for membership, and unless there were some valid objection the Council could hardly fail to elect them. There were cases where persons were elected who afterwards had to be removed, but if gentlemen were recommended by an established wholesale house, and proposed and seconded by members of Council they ought to be elected.

Mr. Hampson thought they should be as liberal as possible in electing members, and it did not at all follow that a man was not eligible as a member because he had not served an apprenticeship. They ought not to throw any obstacle in the way of chemists and druggists becoming members.

Mr. Williams agreed that there should be no attempt to draw any line which would prevent chemists from becoming members.

Mr. Urwick thought it would be advisable to communicate with the Local Secretary in the case of proposed members from the country, and that the Secretary should do so.

Mr. Brown said every precaution ought to be taken to prevent unsuitable persons being elected, but he did not think that examined members had any just ground for complaint; nor ought the line to be drawn too strictly. He was quite sure that every means had been taken to ascertain if the gentlemen whose names were proposed were suitable, but he must protest against the idea that members of the trade were conferring any benefit on the Society by paying an entrance fee and becoming members. There would be no difficulty in any properly qualified man finding means to get himself recommended by a member of Council.

Associates.

The following, having passed their respective examinations, were elected "Associates in business":—

MINOR.

Stanley, Herbert .... Leamington.

MODIFIED.

Hickman, Frederick .... Newbury.
Powell, Edward Foley ...... Birmingham.

The following, having passed their respective examinations, were elected Associates:—

MAJOR.

Joule, John Samuel .... Buxton.

MINOR.

Allison, Reuben .... Glantwrch.
Appleton, Arthur James...... Attercliffe.
Brown, George Matthew .... Landport.
Crisp, Frederick Arthur ...... Clapham.
Dismorr, Henry .... London.
Francis, William Henry ...... Diss.
Harry, Seth .... Gravesend.
Hilston, David P. .... Lanark.
Lindsay, Robert .... Lasswade.
Maurice, James .... Cardigan.
Munro, John Morrison ...... Aberdeen.
Partridge, Samuel .... Dudley.
Saunders, Thomas Bealby .... Cheltenham.
Savell, Edward Pearce ...... Southampton.
Stewart, Edward Hinton .... Tiverton.
Verity, William .... Northampton.
Walden, Robert Woolley .... Newark.
Walton, William Henry...... Croydon.
Young, John .... Edinburgh.

MODIFIED.

Burdon, Thomas Austin ...... Durham.
Sheel, Robert, jun. .... Rugeley.

The Secretary presented a list of 35 members and four "Associates in business" who had paid their subscriptions subsequently to the 30th April, and it was

Resolved — That they be restored to their former status on payment respectively of a nominal fine of one shilling.

The following, being duly registered as pharmaceutical chemists, were respectively granted a diploma stamped with the seal of the Society:—

Henry, James Hay .... Macduff.
Kendall, Edward Basnipp .... Nottingham.
Laugher, William .... West Bromwich.
Sant, George .... Atherstone.

APPOINTMENT OF COMMITTEES.

The following Committees were appointed:—

General Purposes—The whole of the Council; to meet as occasion requires.

Finance—Messrs. Betty, Greenish, Hampson, Owen and Urwick; at 11 A.M. on the day preceding the Meeting of Council.

Library, Museum and Laboratory — Messrs. Betty, Bottle, Greenish, Hills, Sandford, Schacht and Williams; at 11 A.M. on the second Wednesday of each month.

House—Messrs. Betty, Bottle, Greenish, Hills, Sandford, Schacht and Williams.

Benevolent Fund—Messrs. Betty, Greenish, Hampson, Owen and Urwick.

Parliamentary—Messrs. Atherton, Betty, Bottle, Hills, Hampson, Owen, Sandford, Savage, Shaw and Williams; with power to add to their number.

Provincial Education — Messrs. Atherton, Baynes, Betty, Frazer, Mackay, Radley, Sandford, Schacht, Shaw, Stoddart, Sutton, Urwick and Williams; to meet when required on the day preceding the meeting of Council, at 4 P.M.

On the appointment of the Provincial Education Committee,

Mr. SCHACHT suggested that the word "provincial" should be omitted, in order that the question of education generally might come under the cognizance of the committee. It was clear that if the subject of provincial education were gone into with anything like a large spirit, they would touch interests that were not altogether provincial. London was a large province in itself; and many operations which they might think it desirable to inaugurate would affect portions of London. There were other subjects connected with education, as carried on in that building, which he thought would be all the better, at any rate, for ventilation.

The PRESIDENT said the subject was a large one, and he did not think it could be satisfactorily disposed of on that occasion. He thought the best way would be for the committee to meet under its ordinary name; and then, after full consideration, if they thought right, they could come before the Council with any suggestion as to the alteration of the name or otherwise.

The committee was then appointed, as above.

On the motion for appointing Boards of Examiners,

The PRESIDENT announced that Mr. Hanbury desired to withdraw, as he considered there should be changes in the board from time to time.

BOARDS OF EXAMINERS.

England and Wales.

The following *twelve* pharmaceutical chemists were elected and appointed Examiners for England and Wales for the ensuing year, subject to the approval of the Privy Council:—

Allchin, Alfred .... London.
Barnes, James Benjamin .... London.
Bird, Augustus .... London.
Carteighe, Michael .... London.
Cracknell, Charles .... London.
Davenport, John Thistlewood .... London.
Edwards, George .... Dartford.
Gale, Samuel .... London.
Garle, John .... Bickley, Kent.
Ince, Joseph .... London.
Linford, John Samuel .... London.
Southall, William .... Birmingham.

Scotland.

The following *eight* Pharmaceutical Chemists were appointed Examiners for Scotland for the ensuing year, subject to the approval of the Privy Council:—

Ainslie, William .... Edinburgh.
Aitken, William .... Edinburgh.
Buchanan, James .... Edinburgh.
Gilmour, William .... Edinburgh.
Kemp, David .... Portobello.
Kinninmont, Alexander ...... Glasgow.
Noble, Alexander .... Glasgow.
Young, James Robert .... Edinburgh.

The President and Vice-President are on all Committees *ex officio*, and on the respective Boards of Examiners in London and in Edinburgh.

EDITOR AND SUB-EDITOR.

Dr. Paul was reappointed Editor of the Society's Journal for the ensuing year.

Mr. Passmore was reappointed Sub-Editor of the Society's Journal for the ensuing year.

LOCAL SECRETARIES.

On the motion for the appointment of local secretaries,

The SECRETARY said there was great want of interest throughout the country as regards the returns for the nomination or appointment of Local Secretaries; for in no less than 70 towns, entitled by the number of members to have a Local Secretary, there had been no return whatever.

The Council then elected Local Secretaries for the ensuing year. *The list will be published next week.*

Conversazione.

Resolved—That the best thanks of this Council be given to their Lordships the Committee of Council on Education for the use of the South Kensington Museum on the 15th of May, for the purpose of holding the Society's Annual Conversazione.

Resolved—That the best thanks of this Council be given to the Offical Staff of the South Kensington Museum for the excellent arrangements for the Society's Conversazione on the 15th of May, and for the courteous and efficient manner in which they were carried out.

Sessional Address in October.

Mr. Stoddart, of Bristol, being requested, consented, to deliver the inaugural sessional address in October.

Finance Report.

The Report of Messrs. Haselden, Betty and Greenish, who acted as the Finance Committee in auditing the accounts for the past month, was presented, showing on the General Fund account a balance of £3685. 5*s.* 8*d.*, and submitting for payment accounts amounting to £989. 4*s.* 8*d.* On the Benevolent Fund account a balance of £670. 18*s.* 5*d.*

Resolved—That the Report be received and adopted, and payments made.

Resolved—That the Treasurer be requested to purchase Stock on the following accounts:—

General Fund...... New Three per Cents. £1000
Benevolent Fund .. Consols £500

The Report of the Parliamentary Committee was received.

Resolved—That the Report and recommendations of the Library, Museum and Laboratory Committee be received and adopted, and that the following books be purchased for the Society's library:—

Pharmacopœia Germanica.
Buchner's Commentär zur Pharmacopœia Germanica.
Silver's Outlines of Elementary Botany.
Miller's Chemical Physics, 5th edition.
Davies' The Preparation and Mounting of Microscopic Objects.
Balfour's Class Book of Botany, 3rd edition.
Johnson's How Crops Grow, revised by Church and Dyer.
Latham's English Grammar.

Benevolent Fund.

Election of Annuitants.

Resolved—That it is expedient and desirable that notice be given in the Journal that this Council will be prepared to elect, in October next, two annuitants on the Benevolent Fund; each annuity of the value of £30.

REPORTS OF THE BOARDS OF EXAMINERS.

Scotland.

April, 1872.

Examinations.	Candidates. Examined.	Passed.	Failed.
Major	3	2	1
Minor	9	7	2
Modified	4	2	2
	16	11	5

England and Wales.

May, 1872.

Examinations.	Candidates. Examined.	Passed.	Failed.
Major	5	2	3
Minor	49	24	25
	54	26	28

Preliminary.—Certificates received:—

Law Society	1
College of Preceptors	3
University of Oxford	2
" Cambridge	1
	7

Mr. Schacht inquired whether candidates who passed the examination were entitled by virtue thereof and on paying the fees to assume the name of chemists and druggists and go into business without any inquiry as to whether they had had any experience in the trade?

The Secretary said the examiners were bound to examine all candidates who presented themselves irrespective of where or how they acquired their information.

Mr. Williams said that was the principle which the Society had always held, that they would not insist upon apprenticeship, but that provided candidates satisfied the examiners of their capacity to conduct a business, they were allowed to do so.

Mr. Betty then rose to move the resolution of which he had given notice:—

"That such reporters as the Council may decide to invite be allowed the opportunity of reporting the proceedings of the Council."

He said about three years ago the first motion for publishing the proceedings was given by Mr. Brady, of Newcastle, but at that time the idea seemed so utterly impracticable that it was not acted upon in any way. Last year, however, on his own motion for the admission of reporters, the stronghold of secretiveness fell down like the walls of Jericho at the trumpet blast. The gentlemen who had been previously contented to sit at the Council Board and conceal their opinions as far as their constituents were concerned, for that was what it amounted to then, so far conceded the point that it was decided that the proceedings should be published, but only in a certain manner. Being able no longer to contest the principle, they fell back on a way of defeating it to some extent, which consisted in filtering the reports so finely through the Publication Committee as to make some people, at all events, suppose—and they ought to avoid all suspicion of the sort—that they filtered the very essence out of the proceedings. Now, what was the nature of the resolution proposed at that time? It was that the proceedings should be submitted to a committee, consisting of the President, Vice-President, and one other member of the Council. He contended that this arrangement was undignified in every way, and not conducive to the best interests of the Society. He also believed that such a mode of proceeding encouraged the diffusiveness which occupied a great deal of time, and detracted from the efficiency of their labours. If gentlemen who spoke at the Council were persuaded that they were speaking *coram populo*, and that what they said here would be attributed to them outside, they would not be as often led away from the business in hand, and the work would be much better done. In addition to this, he took it to be an impossibility that any one who took an active part in a debate could be a proper person to judge of the feelings, sentiments and impressions of those who had been opposed to him. It was a psychological impossibility for the President, for instance, to fairly appreciate those arguments which did not commend themselves to his own mind, and, therefore, it could not be expected that he would fully represent the spirit of any such remarks. It was not the right thing that any one should control the reporting of the debates who was deeply interested in the proceedings, and who might take a leading position with regard to any question at issue For these reasons he thought it not desirable that they should continue with their present imperfect system of reporting. He was not unaware of the fact as a member of one year's standing on the Council that there were practical difficulties in the way, and he was not bringing forward this resolution with the intention of catching a division or of in any way hampering their proceedings; but he looked upon this Council as something more than a debating society, and he did not wish the question to be argued on matters of detail, but simply on abstract grounds. He had seen the difficulties and dangers to which they were exposed; and he was most anxious in bringing this matter forward that, whilst affirming the principle that being a representative and administrative and deliberating body they ought to be fully reported to those whom they represented, still he wished that every safeguard which the Council might deem necessary should be interposed to prevent any inconvenience arising. He was aware that a great distinction must be made between public and private business. In order that the matter should be decided upon principle and not on mere matters of detail, he would propose that the matters to be reported should be only of a public character; and, moreover, in order that the manner of carrying that out should be such as was most in the interests of the Society, he would move that a committee be appointed to report to the Council as to the best mode of carrying out the principle he desired to affirm. He did not wish the Council to be led into the slightest personal inconvenience, and was aware that these matters required great caution. If the Council thought that with these safeguards which he had enumerated, the principle should be affirmed that matters to be reported should be simply matters of public interest and not private, and that a committee should be appointed to decide as to the best form of carrying out the resolution, he thought every practical difficulty would be obviated, and he desired this motion should be decided upon principle. Before sitting down, as he felt very strongly upon this matter, he would urge upon every member not to be afraid of their own shadows, but to have the courage to let whatever opinions they expressed be published in the Press the next day.

The PRESIDENT said Mr. Betty seemed rather to have departed from the words of his resolution, inasmuch as he now proposed the appointment of a committee.

Mr. BETTY said he should stick to the words of his resolution, but in order that the debate should not take place upon matters of detail, he added that if the principle were affirmed, he would propose the appointment of a committee to carry it out.

Mr. BROWN suggested that the resolution should be modified, and stand thus:—

> "That it is desirable that such reporter, or reporters, as the Council may desire to invite be allowed the opportunity of reporting the proceedings."

Mr. BETTY said perhaps that would be the more convenient way of doing it, and he would accept the suggestion.

Mr. WILLIAMS said he could go with Mr. Betty this length, that the reports should be published more fully than they had been, but did Mr. Betty wish to have other reporters admitted? and if so, how many, and how would he have any control over such other reports?

Mr. BETTY said the Council would invite such reporters as they thought fit.

Mr. HAMPSON said he would second the resolution with great pleasure. For a considerable time he had felt that the proceedings of the Council were not reported satisfactorily either to themselves or to the members at large. Opinions were expressed at the Board of really vital importance, affecting the trade at large; and he thought the trade had a right to know what members representing them said upon the subjects under discussion. However anxious the two or three individuals might be who, as Mr. Betty termed it, had to filter the report, to do so fairly it was utterly impossible for them if they took any interest in the question under discussion, to give a fair and honest report. But it was of great importance that matters which took place from month to month should be ventilated immediately and not allowed to accumulate, but that the opinions of those outside should be expressed upon them as they arose throughout the country, and they could then be much better decided. A man might not be able to express himself in fine language, and would not be reported at length, but half-a-dozen words would really give the pith of his argument, and this might have an effect upon other minds, whereas if it was simply stated that he seconded a resolution, or voted for this or that, it was impossible for the members outside to know anything about what his opinions were. This he believed was one great cause of those extraneous organizations of which they had heard, and which some gentlemen had such an objection to. He did not think there was a gentlemen present who really objected to the principle involved, although it was a new thing, and many new things were unpleasant, still, under the Pharmacy Act, they now had to make regulations as to matters which affected the whole trade, and they were bound to give the members at large the full benefit of their deliberations.

Mr. SANDFORD said he was one who certainly was of the contrary opinion on this point. Mr. Betty had talked a great deal about filtering the reports; but he could tell him there had been no filtering of an objectionable kind, and if Mr. Betty had read through the shorthand-writer's notes from the beginning of the year to the end, he was quite certain he would have filtered them as extensively as had been done. He (Mr. Sandford) had had a great deal to do with this matter, and he felt that the reporting had been done honestly, and that there had been nothing suppressed which any one gentleman present would say ought to have been inserted. When it was said that it was impossible for the President, who would take one view, to fairly represent the views of a gentleman who took the opposite side, it was forgotten that it was quite possible that another gentleman on the Committee might hold the opposite view; and therefore both sides would be fully represented. Gentlemen who had been sitting on the Council even for one year must know that there was an immense amount even of what might be called public business which was not suitable for publication. There were many matters coming up affecting different individuals which it would be most injurious to publish, at any rate when they were first mentioned. Therefore, there were many matters of really public business which must be carefully and only partially reported; but he would move, as an amendment,

> "That a Committee be appointed to consider the advisability of admitting other reporters to the meetings of this Council, and that the shorthand-writer's notes of the past year be put into the hands of the Committee, in order that it may be seen whether any matter which it would have been desirable to publish has been suppressed."

He felt that any Committee, looking over those notes, would feel as the President and Vice-President and he had felt,—that they had reported everything which ought to be reported. Other members of the Council had been present on several occasions,—for instance, Mr. Bottle and Mr. Mackay,—and they would be able to say that there-was no desire to suppress anything which ought to be published. The reports of the last two meetings of the old Council were said to be more full than they ever had been before; but the fact was that the subjects were more particularly interesting to the country, and could therefore be published with advantage, and also their reporter had, he thought, given them better reports of late, which he explained in this way,—that coming amongst them twelve months ago a perfect stranger, he did not understand the proceedings so well as he did when he was better acquainted with them. Taking the sheets sent in by the reporter, it was now only necessary to draw a pencil through such parts as were not to be published, and leave the rest almost entirely unaltered. He therefore thought it would be much more satisfactory to appoint a Committee without affirming the principle now; because the matter must be looked in the face, and they must consider who they were going to invite. If reporters in general were admitted, they could not exclude one and admit another, and all papers connected with the trade, and perhaps the medical journals, might claim to send reporters, which he thought would be very inconvenient.

Mr. Williams said he would second the amendment in order that it might be discussed, because he thought the real question was whether they should have one reporter under their own control, or other reporters not under their own control, and he was certainly an advocate for having one reporter under the control of the Council. In his opinion it would be very objectionable to have strangers present whom they could not control in any way, or direct as to what should be published and what not.

Mr. Savage said he would much rather leave it to the gentlemen who were accustomed to report proceedings of public meetings. He had sufficient confidence in reporters to believe that they would not publish anything improper. There was of course a great deal said there which no one would like to see in print, but he believed that reporters would only give the matter which would be interesting to the members at large. He did not care about anything he said or did being reported, but one incident had occurred to him which illustrated the matter. He gave a notice of motion at the suggestion of others, to the effect that it was desirable to keep open the Library in the evening, and there was no notice whatever taken of that until the notice appeared in the Journal that the library was to be opened. Now he could see no objection whatever to have reported that the question was brought forward by Mr. Savage at such a time, and then those gentlemen who had communicated with him on the subject, would have known that he had brought it forward, whereas he had to write to them to tell them that it was under consideration. He felt sure that whether there were one or more reporters present, they would be quite safe in their hands, and a great deal of trouble would be saved to the Committee who now superintended the publication.

Mr. Owen supported the resolution, and said it would be quite competent to the Council to request the reporters to leave the room if any private matter were under discussion.

Mr. Urwick said he fully agreed with publicity himself, and was quite willing to trust to the reporters, who, he was sure, generally speaking, flattered most people in their reports. He should therefore support Mr. Betty, but with the understanding of a Committee being appointed, because he did see difficulties in the way.

Mr. Stoddart said there were matters occasionally coming up which members would have difficulty in speaking upon if they thought they would be reported the next day, and many instances would occur to the minds of gentlemen present of questions which were discussed, and which ought to be discussed, but which it would not be pleasant to see published. But, if these difficulties could be obviated, he saw no objection to reporters being present.

Mr. Schacht hoped Mr. Sandford would not press his amendment, for it would be a very invidious and unpleasant task if any committee, such as he proposed, were to be appointed to have to go through all the shorthand writer's notes of the past year and report whether the Publication Committee had done their duties honestly and fairly. Speaking, however, on the abstract principle, as far as he understood the matter, he thought there ought to be the fullest possible publication of their proceedings, and he could not help thinking that in any public business the more gentlemen were aware that whatever they said would be reported, the more careful they would be as to what they said and their deliberations would be conducted with more dignity, and perhaps with better judgment. There would, no doubt, be a difficulty here and there, but he had expected to hear much more on that point than he had. The only point of much consequence appeared to be that occasionally questions arose touching individuals in the trade which would naturally not be laid before the whole world; but all such personal questions might surely be discussed beforehand in committee, and they would not be broached in the Council room until the matter had been completely sifted and verified. He certainly hoped that Mr. Betty's motion would be carried unanimously, and thought they would then find that the Council and its constituents generally would be at one.

Mr. Baynes thought the reporting might be safely left in the hands of the reporters who were, as far as his experience extended, free from any political or other bias, and were thus able to report any matter which came before them freely, fairly and impartially. But he must say that in years gone by, when he had taken part in public proceedings, he had gone home somewhat nervous as to what he had said, and had been quite rejoiced the next morning on reading the report. He was quite sure, therefore, that those gentlemen would exercise a reasonable discretion, and that no one need fear anything being improperly published. With all respect to the gentlemen who had acted as the Publication Committee, he thought it must be a most unpleasant duty for them to supervise the speeches of gentlemen from whom they might materially differ, and would be exceedingly difficult for them in such a case to give the whole force and effect of what was meant by the speaker. A reporter having no feelings whatever on the matter would see very much clearer what the speaker was aiming at, and if he was obliged to report only one fourth of what was said, he would make the speech a much better one in reading than it was when delivered.

Mr. Sandford said, in order to meet Mr. Schacht's objection, he would omit the last words of his amendment respecting the reporter's notes, and substitute for them the following words: "*in order to assist them* (*the Committee*) *in the consideration of the matter.*" He really wished they would look through the reports, because there was a sort of charge against the Committee of having suppressed matters. It was said that they had not reported fully, but it was a most remarkable circumstance that during eleven months of the year there was not a member of the Council who ever said that the report was insufficient. He challenged them all on that point. With regard to the instance mentioned by Mr. Savage, he did not know that it was ever usual to report notices of motion until they were brought on for discussion.

Mr. Sutton said Mr. Schacht had nearly expressed his views on the matter, but he should like to put forward a second amendment to the effect:—

> "That the reporter now engaged to take shorthand notes at the Council Meetings be required to take full reports of the proceedings of Council, and that the same be published in the Journal, except in so far as may be otherwise ordered by the Council."

Mr. Brown said he should vote for Mr. Betty's motion, and he did not see that there was any occasion for Mr. Sandford's amendment, because the motion was that such reporters as the Council should decide to invite should be admitted, and the Council might, and he thought very probably would, decide that they would only invite one reporter, the same as at present. He did not think it at all desirable that any reporters who might apply should be present, and thought it more than likely that as heretofore the Council would decide to invite only one. He did not think there was any risk of private matters being reported in an undesirable form, because he believed that when it was known that the proceedings of the Council were more fully reported, and that the shorthand writer exercised simply his own discretion, subject to the supervision of the Editor of the Journal, the proceedings would be very materially shortened, and another advantage would be secured that the committees would do their work much better than they did at present. During the last two years he had certainly seen a great deal of work done at the Council Board which ought to have been done in committee, the results only being submitted for confirmation. There was another means of getting rid of any difficulty with regard to personal matters which always would be coming up for discussion, and that was to refer them to the General Purposes Committee, which could be summoned for any time, and which consisted of all the members of the Council. In this way any subject which it was not desirable to discuss in public could be ventilated and afterwards brought before the Council in such form that there could be no danger of any one's feelings being hurt by the proceedings being published. He could see no practical inconvenience from the adoption of the motion, and in justice to the members of the Council themselves, and certainly in justice to the whole of their constituency who earnestly desired that this change should take place, he should vote for it; but in doing so, he must say that he did it with the reservations that from his own personal knowledge, he could acquit the gentlemen who superintended the publication from any charge of improperly filtering the reports submitted to them. He had been surprised at the amount of pains and trouble taken; and whatever had been suppressed had been done in charity to the readers and from the very best motives, and certainly with the purest intentions.

Mr. Sandford said after what Mr. Brown had said he would withdraw his amendment, but it certainly put a new complexion upon the motion. He understood Mr. Betty desired the Council to affirm the principle that other reporters should be admitted, whereas Mr. Brown said he did not accept that interpretation.

Mr. Hills said he had objected previously to the admission of reporters altogether, but the time for that had passed by, and he would now support the motion if Mr. Betty would confine it to one reporter. He was quite content for their own reporter to make his reports as full as he chose and, if he liked, to supply them to other journals. He was therefore quite prepared to support Mr. Betty after Mr. Brown's explanation—at any rate, that they should only have one reporter to begin with.

Mr. Sandford said if they were not now affirming the principle that other reporters should be admitted, he would vote with Mr. Betty.

Mr. Betty said the principle he wanted to affirm was that they should not make speeches and then dress them up themselves for publication afterwards, but that every expression of their sentiments and their policy should be published through the legitimate channel. He believed that in every other institution which published its proceedings, it was done through the medium of gentlemen of the press, who understood their business much better than any amateur triumvirate could do. It might perhaps at first sight be more agreeable to the feelings of some members to know that nothing they said should appear unless it had the sanction of one or two of their fellow-members, but they were quite as likely to err as a reporter, whose business it was to attend to such matters. He should leave it to the committee to decide who should be admitted. He only desired to affirm the principle and leave them quite untrammelled. He did not wish to bind them to admit two reporters, nor on the other hand, would he admit that it would be always desirable to confine it to but one. It was a matter of detail which he would leave to the Committee.

Mr. Sandford said he would withdraw his amendment if the understanding was that the motion did not pledge them to admit other reporters, but if it did he must press the amendment.

Mr. Betty said he could not ask for Mr. Sandford's vote under the slightest misapprehension as to his meaning. It was entirely a matter of principle whether their proceedings should be made public or not, and he was not to be bound down or hampered in the wording of the resolution as to how it should be done. He wanted to affirm the principle that there should be general reporting and full reporting.

Mr. Sandford said there might be the fullest reporting with their own reporter.

Mr. Betty said it would be open for the committee to appoint one reporter, but he would not bind them to do so, nor in any way prejudge the questions submitted to them.

Mr. Brown said he must not be misunderstood. He most entirely agreed with the principle that it was desirable that the proceedings should be fully reported, but he thought it more than probable that when the committee came to deliberate on this subject, they would consider it desirable, at any rate for the first twelve months, to have only one reporter. This was a great and radical change, and they must have time to get accustomed to it.

Mr. Sandford said he would withdraw his amendment, because the discussion would stand on record, and would show in what way the motion was voted for and carried, and that they were not pledging themselves to the admission of other reporters.

The President said that there was still Mr. Sutton's amendment; but, before putting it, he would say a word or two, having had a good deal to do with the publication of the proceedings. If anything had been kept back, it was not from any desire on his part. No doubt many would remember that on more than one occasion, when a particular question had been brought forward, he had asked the Council whether the discussion should be reported or not, and the answer had been in the negative. Sometimes, again, he had asked gentlemen, after the Council, whether they would like their remarks reported in full, and they had replied, "Not exactly." For himself, he had no objection to publishing every word that was spoken, and he thought they might be published from the notes of their own reporter quite as well as from any others. The only objection he saw to the motion was that the word "reporters" was used in the plural. He thought one reporter sufficient, and that he should be the one engaged by the Council; he could see no advantage in having two or three reporters. With regard to the circumstance referred to by Mr. Savage, he believed the regulation as to opening the library in the evening was published in the Journal as soon as possible; and it was not customary or desirable to publish notices of motion, which might, from various circumstances, be withdrawn and not discussed or acted upon.

Mr. Sutton said he must press his amendment, because he thought the principle to be decided upon really was, whether one reporter or more should be present. He thought there should be one only, but that no restriction should be put upon his discretion in reporting the proceedings.

The President said the only difference seemed to be as to the use of the plural "reporters." Perhaps Mr. Betty would alter his motion so as to meet Mr. Sutton's view.

Mr. BETTY said he could not do that. The question really was whether the publication of the proceedings should be under the control of the Council, which he contended was a vicious system, or whether it should be left in the hands of the press, whose impartiality no one would dare to impugn.

The PRESIDENT thought one reporter was as good as half-a-dozen.

Mr. BETTY said it was no use appointing a Committee and tying their hands.

The PRESIDENT said he would put the amendment, Mr. Sutton having altered the wording so as to avoid the necessity of a needlessly diffuse report being published.

Mr. SANDFORD said the right of control must be reserved to the Council. They must be masters of their own proceedings.

Mr. BROWN: Are the proceedings of this Council public or private?

Mr. BETTY said he thought they were public, or they could not be published.

Mr. SANDFORD said, in his opinion, they were private. It was quite competent for any one to publish private proceedings if they liked.

Mr. SCHACHT did not apprehend that the proceedings of any representative body could be private.

Mr. BROWN said that this was a question which every member ought to settle for himself. He had always regarded them as public. He considered the mere fact of allowing any report to be published, militated against the contention that they were private proceedings. He thought every member ought to be prepared to stand or fall by his utterances. If there were any matter advisable not to be published, they could resolve themselves into committee.

The amendment was then put and lost, and the original motion, as altered by Mr. Brown, was put as a substantive motion and carried.

It was then moved by Mr. BETTY; seconded by Mr. BAYNES, and Resolved—

"That a Committee be appointed to inquire into and report to the Council the best means of carrying into practice the vote of the Council for the admission of a reporter or reporters, and that the following be the Committee:—Messrs. Betty, Bottle, Hampson, Mackay, Sandford, Savage, Sutton, Urwick and Williams."

Mr. BOTTLE said he was present on one occasion when the Publication Committee were at work, and he was bound to say that he could fully bear out all that had been said as to the work being done most honestly and laboriously; and he was certain the Committee desired to publish not only their own views, but the views of those opposed to them, and he moved,

"That the President, Vice-President, and Mr. Sandford be appointed a Committee, *pro tem.*, to superintend the publication of the proceedings of the present Council."

This was seconded by Mr. SAVAGE, and carried unanimously.

Mr. BROWN said he would now move in accordance with the promise he had made at the General Meeting,

"That the solicitor of the Society be requested to draft and submit to the next meeting such an alteration in the bye-laws as will provide that due notice should be given of any proposal for the Annual Meeting by which the legal position of Members of the Pharmaceutical Society, or of the general body of chemists and druggists, would be altered."

He thought this would be the better way of dealing with the question, because if he suggested the terms of the new bye-law, it would have to be referred to the solicitor afterwards, and the course he proposed would save time.

Mr. SCHACHT seconded the motion.

Mr. WILLIAMS said the first question was, did they desire to make any alteration in the bye-laws, which was a very serious matter? Such a bye-law as was proposed would really give the chairman of an Annual Meeting power to stop the business, and he thought it involved a dangerous principle.

Mr. SANDFORD thought the resolution, in principle, a good one, and Mr. Flux had stated that there would be no difficulty in framing a bye-law to the effect that no motion which would involve legal consequences under Section I. of the Act, should be brought forward without due notice.

Mr. BROWN said it was only under Section I. that any legal consequences could arise. He considered that it would be an insult to the Council, who were chosen to conduct the affairs of the Society, for any member to bring forward an important motion at a general meeting without first laying it before the Council.

Mr. HAMPSON thought they were bound to make the alteration in the bye-laws if possible. It was one which would cut both ways, and he could not see any possible objection to it.

Mr. URWICK said he should support the motion, for he had been quite astonished at the last meeting to find they were in such a state as to require it, which he did not think was the case with any other similarly constituted body. He was in favour of the right to a poll in case of dispute.

The PRESIDENT said no doubt the solicitor would inform them that he could frame a bye-law, but that it was not usual for a Society to tie its own hands more than necessary.

Mr. BOTTLE thought such a bye-law as was proposed was contrary to the spirit of the Act of Parliament.

Mr. BETTY said the bye-law would not override the Act of Parliament, it would simply prescribe the mode in which the action contemplated in the Act should be carried out.

The resolution was then put and carried.

The SECRETARY read a letter from Mr. Sowerby, Secretary to the Royal Botanical Society, stating that the same facilities would be given to students attending Professor Bentley's class as heretofore under the same regulations.

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

The thirteenth General Meeting was held May 9th; the President, Mr. E. DAVIES, F.C.S., in the chair.

The PRESIDENT showed one of Fletcher's gas furnaces, and made some trials with it to show its efficiency.

Mr. A. E. TANNER described the process of making perchloride of iron with chlorate of potassa, and said he found that it gave very satisfactory results.

No paper was read.

The fourteenth General Meeting was held May 23rd; the President, Mr. E. DAVIES, F.C.S., in the chair.

The HON. SECRETARY referred to the paper which had been read before a meeting of the Pharmaceutical Society in London by Dr. Redwood, on the "Substitution of Proportional Numbers for specified Weights and Measures in the description of Processes in the Pharmacopœia," and which was published in the PHARMACEUTICAL JOURNAL of Dec. 9th, last year, and said he felt sorry that the subject had not been brought before this association, as Dr. Redwood had stated that his object was to receive the opinion of practical men as to the desirability of carrying out the proposed change, before he devoted the time and labour necessary to recast the formulæ, and he thought the best reply would be the expressed opinion of the different associations throughout the country. He hoped the subject would be fully discussed next session. His own opinion was that if the proposed change would lead to an earlier adoption of the metrical system, it should be adopted; but its value and utility was principally as a means to this end.

The PRESIDENT said he should like to see the metrical system adopted at once. It had been introduced into almost every continental country and some in South America, and he trusted the time was not far distant when it would be also introduced and universally applied in England.

The PRESIDENT then read the following (the valedictory address of the session):—

"In the absence of any recognized formula for the production of valedictory addresses, I may be excused if I bring rather a miscellaneous assemblage of subjects before you this evening. The range of interesting matter embraced by the objects of the Chemists' Association is so wide that many points must go untouched; and if I fail to mention any facts new to all, or to give any new or valuable views of my own on vexed questions, I hope to excite some little discussion, or to suggest some lines of thought which the members may develope for our mutual profit.

"No startling novelties have marked the record of chemical discovery since I addressed you at the opening of the session. In the field of artificial production of organic compounds,—one of the most important now worked by chemists,—the only one with which I have met is the formation of dulcite,—$C_6H_{14}O_6$,—a substance resembling mannite, obtained from *Melampyrum nemorosum* and other sources—by hydrogenating galactose, a product of the action of dilute acids on milk sugar. This was naturally suggested by the previous artificial production of mannite from glucose. I refrain from speaking of the numerous researches in organic chemistry which have been recently made, as many of them are of purely scientific and limited interest. Some, having a special reference to the properties or composition of drugs, I will now bring before you.

"Opium, which is about the most heterogeneous mass of organic bodies, has had its complexity still further developed by the addition to the list of cryptopine, protopine, laudanosine, laudanine, codamine, and hydrocotarnine. Dr. Wright is still working on the opium alkaloids, with results which promise valuable information as to the constitution of these bodies. An improvement in the iodic acid test for morphia increases the delicacy of this reaction, so as to render the detection of that alkaloid much more certain.

"Senna is a still more difficult body; and here I regret that we seem further off than ever from a clear insight into the active principle or principles of the leaf. The main results appear to be that there are several purgative substances in this drug,—chrysophanic acid, cathartic acid, and some other not determined; the cathartine of Lassaigne and Feneulle being shown to be a mixture. (Bourgoin and Bouchut.)

"Therapeutics are perhaps scarcely admissible; but anything like an intelligible idea of the action of medicines is so rarely to be met with, that no excuse is needful for bringing before your notice an investigation on the influence of quinine on oxidation in the blood (A. Schulte). In this, quinine is shown to arrest fermentation and putrefaction, killing fungi, bacteria, etc., and stopping the action of certain substances which produce ozone. The red corpuscles of the blood can do this, and therefore quinine diminishes oxidation, lowers the temperature, and arrests fever. Naturally, waste of tissue also diminishes; and a very remarkable fact is that picrate of sodium will act in the same way, whilst cinchonine has much less influence.

"I think that in my opening address I made a very fair prophecy as to the utter futility of our present laws for preventing, or rather punishing adulteration; and I appeal to the experience of the tentative efforts of the Corporation as a fulfilment of it. With regard to adulteration, Englishmen will do anything but act. They will write to the papers, conjure up the most horrible pictures (mostly false) of the practices of the unprincipled adulterator, will assure you that they know that the food they buy is not genuine; and yet they will not walk to the end of the street to have an article tested. Our papers, big and little, carefully informed the public that they could have any article of food analysed for nothing, that no personal appearance in any prosecution would be needed, no risk run of being a martyr for the public good, and that the trouble and expense would all fall on the broad shoulders of the Corporation. Yet where is the result? I have looked daily in the papers for any action, but in vain, and I can only draw two conclusions. One is, that every fraudulent sinner in Liverpool has seen the error of his ways, has destroyed his adulterated stock, and told the wholesale dealer that henceforth nothing but pure articles, at a fair price, will be received,—a moral revolution of which we might well be proud, even though fear of the public analyst had supplied the place of conscience. But I fear that this is too fair a picture, and that the truth is, firstly, laxity on the part of the public; and, secondly, a well-grounded despair in the official mind of doing anything in the present state of the law.

"While on this subject, I have much pleasure in calling your attention to a series of papers in the PHARMACEUTICAL JOURNAL by Mr. Pocklington, on the use of the microscope in the detection of adulteration and the study of the minute structure of drugs.

"I would willingly abstain from any allusion to the question of help to schools of pharmacy from the central body, but it has assumed sufficient importance to demand some remarks. Of course I speak for myself only, and my double position as President and Teacher must make me careful. We may lay down a few axioms which may assist our thought on this matter.

"1. Education of a special kind must be provided for young men if they are to pass the examinations. This education is not generally to be met with in educational establishments. Chemistry is certainly pretty universally receiving attention, and in almost all large towns some measure of instruction is available, but as to botany, pharmacy and materia medica, teaching must be specially provided.

"2. Many masters are themselves unable, even if willing, to give such instruction to their apprentices.

"3. Pecuniary and moral reasons prevent many parents from sending their sons to London.

"4. Even if large numbers join classes, the fees, which must not be large, will not give adequate remuneration to teachers. The cause is not one which appeals very forcibly to public sympathy, important as it is, and there is no very direct interest to draw support from those already in business.

"5. The establishment of schools in small places is impossible from lack of means and teachers.

"From these data I draw the conclusion that central places judiciously selected over the country, will afford the only way of establishing schools of pharmacy with any chance of success. With regard to funds three sources present themselves, students' fees, public money, and help from the Pharmaceutical Society. The first on all hands is admitted to be insufficient; Mr. Lowe will demur to the second, and the last remains as the only resort. Local effort should supply a place and fit it up, and then one teacher competent to instruct in all the subjects required should have a minimum amount secured, and after that receive payment on results. Members in small places cannot complain, for at present they have no means of instruction, and this plan would bring it nearer their doors.

"Doubtless there is great indifference on the part of those who have to pass the examinations, or else they are not afforded time. Six for a course of chemistry lectures, two for practical chemistry, and seven for lectures on botany are not very encouraging figures, but we must remember that desultory efforts are rarely successful.

"Our session has not been quite as successful as I would have wished. I have from various causes been unable to do all that I wished and intended when I undertook the office of your President, and must hold myself responsible for some part of the lack of interest manifested. Still papers of considerable value have been read; and on the evenings when papers have been provided, the attendance had been good. I can only express a wish that during the summer you may lay up, like bees, some honey for next winter.

"Dr. Carter has begun a course of lectures on botany, in the arrangements for which he showed the utmost liberality. Members may still join without losing much, as practically only one lecture has been delivered. The minimum number has not been quite reached, and, therefore, the course is yet in danger; but I hope that this will not continue. Though I fortunately have no Minor or Major in view, from the love I have for botany, I have enrolled myself among the doctor's pupils, and anticipate much pleasure and profit. And now I must say farewell, with thanks for your kind consideration during my presidency. May we all remember that knowledge for the love of it should be our motive power, and then with open eyes, in the shop or study, in the crowded street or country lane, we shall not lack objects for profitable consideration to make us wise and better men."

A vote of thanks to the President for his address and for his labours during the session, and also to the Honorary Secretary for his services, terminated the proceedings.

SUNDERLAND CHEMISTS' ASSOCIATION.

The Annual Meeting of the above Society was held on Tuesday, May 28th, when the following officers were elected for the ensuing year:—

President, Alderman W. Thompson; *Treasurer*, Mr. R. Robinson; *Secretary*, Mr. J. J. Nicholson. *Council*, Messrs. J. Harrison, D. B. Sharp, H. Thompson, T. Nasbet, C. S. Lord, J. Mitchinson, H. Turnbull, T. Burn, and J. Priestly.

The Secretary and Treasurer's reports were read and adopted.

Among other resolutions adopted was one proposed by Mr. J. Harrison and seconded by Mr. Hodgson, that a petition be forwarded to the House of Commons in favour of the Bill for exempting chemists and druggists from service on juries.

It was announced by the Secretary that arrangements were in progress for a series of lectures during the next session; and after cordial votes of thanks to the retiring officers the meeting separated.

Parliamentary and Law Proceedings.

HOUSE OF LORDS.

Friday, May 31.

The following Bill was, on the motion of the Earl of Morley, read a second time and referred to a Select Committee:—

A Bill to Amend the Petroleum Act, 1871.

Whereas by Section 3 of the Petroleum Act, 1871, it is enacted as follows:—"For the purposes of this Act the term 'Petroleum' includes any rock oil, Rangoon oil, Burmah oil, oil made from petroleum, coal, schist, shale, peat, or other bituminous substance, and any products of petroleum, or any of the above-mentioned oils; and the term 'Petroleum' to which this Act 'applies,' means such of the petroleum so defined as, when tested in manner set forth in Schedule 1 to this Act, gives off an inflammable vapour at a temperature of less than one hundred degrees of Fahrenheit's thermometer;" and it is expedient to substitute the test in the schedule to this Act for the test in Schedule 1 to the Petroleum Act, 1871:

Be it enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:

1. The schedule to this Act shall be substituted for and be deemed to be Schedule 1 to the Petroleum Act, 1871, and "85" shall be substituted for "100" in Section 3 of the same Act; and the Petroleum Act, 1871, shall be construed accordingly.

2. The Petroleum Act, 1871, as amended by this Act, shall be perpetual.

3. This Act may be cited as the Petroleum Act, 1872, and this Act and the Petroleum Act, 1871, may be cited together as the Petroleum Acts, 1871 and 1872.

4. Section 18 and Schedule 1 of the Petroleum Act, 1871, are hereby repealed, provided that this repeal shall not affect:

(*a*). Anything duly done or suffered before the passing of this Act under the Petroleum Act, 1871; or

(*b*). Any penalty, forfeiture, or punishment incurred in respect of any offence committed before the passing of this Act against the Petroleum Act, 1871; or

(*c*). Any investigation or legal proceeding in respect of such penalty, forfeiture, or punishment, and any such investigation or legal proceeding may be carried on as if this Act had not passed.

5. This Act shall not come into operation before October, 1st, 1872.

Schedule.

Directions for testing Petroleum to ascertain the Temperature at which it gives off Inflammable Vapour.

The apparatus to be employed in this test shall consist of—

(*a*). An outer vessel of metal to contain water, about four inches in diameter and four inches deep, so contrived that some source of heat, such as a spirit lamp or gas burner, can be applied to it to heat the water which it contains:

(*b*). An inner vessel of thin metal to contain the petroleum to be tested, about two inches in diameter and two inches deep, provided with an external rim or flange, above which the edge of the vessel shall rise about one-fourth of an inch, and by which it may be supported in the outer vessel so that its contents may be heated through the medium of the water.

The inner vessel for the petroleum shall be provided with a cover of thin metal fitting to the edge which rises above the rim or flange already described. This cover shall be about half an inch deep, so that its top may be half an inch above the surface of the petroleum to be tested. In the cover there must be fitted a Fahrenheit thermometer with a spherical bulb, in the scale of which ten degrees shall occupy at least half an inch in length; the thermometer must be placed in such a position that the bulb shall be just covered by the petroleum.

Near the front edge of the cover there shall be a circular opening, and through this the petroleum is to be tested. This opening is to be provided with a small movable cover.

In making the experiment with this apparatus the water in the outer vessel shall in every case be heated to eighty degrees Fahrenheit before the petroleum is put into the inner vessel. When the temperature of the water has reached eighty degrees, the source of heat must be withdrawn; the inner vessel must then be filled with the petroleum to be tested up to the level of the outer rim or flange, which must be indicated by a mark on the inside, and the cover with the thermometer must be put in its place. The source of heat must now be again placed beneath the vessel containing the water, and when the temperature of the petroleum in the inner vessel has reached eighty degrees, a small light should be applied to the circular opening in the cover; if the vapour be not ignited—that is, if no pale blue flash or flicker of light be produced—the application of the light should be repeated at about every two degrees of increase of temperature until the flash of the ignited vapour be observed, and the temperature at which the first flash takes place is the temperature at which that sample of petroleum gives off an inflammable vapour.

In every case a second experiment shall be made to check the results obtained in the first.

A model of the apparatus described above is deposited with the Warden of the Standards, and reference shall be made to it in case of any difficulty or dispute as to the meaning of the terms employed in this description.

HOUSE OF COMMONS.

Thursday, May 30th.

The Public Health Bill.

Sir C. Adderley asked the First Lord of the Treasury whether the Public Health Bill, relating to a subject which the Government pressed on the diligent attention of a Commission three years ago, and had twice advised Her Majesty to recommend to Parliament for immediate legislation, and which was now being postponed to other Goverment measures, might not have a morning devoted to its consideration in Committee.

Mr. Gladstone: I can so far comfort the mind of my right hon. friend, with whom we are quite agreed as to the importance of this measure, as to assure him that it would be a mistake to suppose that the Public Health Bill is postponed to the other principal measures of the Government. That is by no means the case, and we are very anxious to arrive at the time when we may deal with the Public Health Bill in the same way as with other principal measures of the Ministry—by devoting to it the whole available time of the House, so far as that time is under our direction and control. We hope to-night to dispose finally of one of the chief Government measures. We shall then proceed with the Scotch Education Bill in the same manner as with the Ballot Bill—that is, by inviting the House to give to it the whole of its available time. In our opinion that is the best way of disposing of all these measures, and we should not confer any real advantage on the Public Health Bill by devoting to it a mere fragment of time. It is for the sake of getting forward with that Bill that we wish to get rid of the measures which at present obstruct its progress.

Monday, June 3rd.

Use of Ether in Ireland.

Colonel Knox asked the Chief Secretary for Ireland whether his attention had been called to the great increase of intoxication in the north-west of Ireland, caused by the use of ether and a mixture of naphtha and ether, sold by chemists and grocers, and whether he was prepared to take steps to put a stop to the abuse, and deter parties who turn their establishments into dram-shops.

The Marquis of Hartington said the attention of the Irish Government had not been called to that matter lately, but as long ago as 1868 its attention was directed to it by a presentment of the Grand Jury of the county Tyrone, forwarded by Mr. Justice George. The Government then made a full inquiry into the subject, and ascertained that the practice of using ether as a stimulant instead of ordinary spirits was confined to the north of Ireland, and principally to the counties of Tyrone and Londonderry, where ether was taken not as an addition to whiskey, or any other spirit, to strengthen it, but merely diluted with water as a stimulant instead of ordinary spirits. Thereupon the Irish Government communicated with the Board of Inland Revenue as to whether any measures should be taken for checking that practice. The Board of Inland Revenue reported that in the existing state of law they could not interfere. The subject appeared to have been further considered by the Government; but, looking to the fact that that practice was almost confined to the two counties he had named, and that ether was very largely used for medicinal and many other purposes, it was not then thought necessary to take any further step in the matter. At present an inquiry was, however, being conducted under the direction of the Irish Government into the alleged adulteration of whiskey in many parts of Ireland. As soon as the reports on that subject were received, they would be considered by the Government, who would also take the opportunity of considering the question to which the hon. and gallant member had referred.

Tuesday, June 4th.

The Juries Bill.

On the motion of the Attorney-General it was agreed that the Select Committee on the Juries Bill do consist of 17 members:—The Attorney-General, Mr. Lopes, the Attorney-General for Ireland, Mr. Raikes, Mr. James, Mr. Kennaway, Mr. Watkin Williams, Mr. W. H. Smith, Mr. Lawrence, Mr. Amphlett, Mr. Pease, Mr. Floyer, Mr. Denman, Sir M. H. Beach, Lord G. Cavendish, Mr. Straight and Sir Wilfred Lawson.

Suicide by Prussic Acid.

On Wednesday, June 5th, Mr. Langham held an inquiry respecting the death of George Mellow, aged about 38, for 20 years in the employment of the Apothecaries' Company, at their Hall, in Water Lane, Blackfriars. The mother of the deceased said that for some time he had been in a bad state of health, and complained of pains in his head, but she never heard him threaten to destroy himself. On Monday morning he left his home to go to his work, when he said he was very sick and ill. She did not see him alive afterwards. George Brown said that during the last fortnight he had been employed in repainting Apothecaries' Hall. On Monday, about ten o'clock, witness went to the jacket-room, and found deceased lying on his back. He called for assistance; and, thinking he was in a fit, they pulled him out into the fresh air. Finding he did not recover, he was removed to the retail department and a surgeon was sent for, but deceased expired a minute or so before his arrival. Witness found on the floor a blue glass bottle, containing prussic acid, from which deceased must have taken about two teaspoonfuls. Mr. Robert Halley said that he considered deceased had not been in his right mind for several months past. Dr. Halse, of New Bridge Street, Blackfriars, said that upon his arrival he found him dead. The body smelt strongly of prussic acid. The jury returned a verdict of temporary insanity.

Poisoning By Oxalic Acid Contained in Black Draughts.

On Thursday, May 30th, Mr. Humphreys held an inquest at the Lord Hood Tavern, Rich Street, Limehouse, into the circumstances attending the death of James Simmons, aged 38, a mariner. The evidence given, which was very lengthy, proved that the deceased returned to London from a coasting voyage, and took up his abode as usual in Jamaica Place, Limehouse, in company with another mariner named Seaman. After being ashore for two or three days the two men asked their landlady to procure them two black draughts, which she accordingly did, purchasing them at the shop of Dr. Trail, of Limehouse. The two men drank off their draughts, but immediately after doing so the deceased fell down insensible, and died shortly afterwards; while Seaman was seized with violent vomiting, and suffered very severely for some days. By order of the coroner, Dr. Nightingale made a *post mortem* examination of the body, and found the whole of the organs of the body quite healthy, with these exceptions—brain intensely congested, effusion of blood into the cavity of the chest and into the pericardium or bag of the heart. The above facts were elicited at the opening of the inquiry, which was adjourned until yesterday to enable Dr. Tidy, professor of chemistry and medical jurisprudence at the London Hospital, to make an analysis of the contents of the stomach. That gentleman accordingly analysed such contents, and detected the presence of oxalic acid, and he said that it was highly probable that the death of deceased was due to swallowing some of that poison. He also told the court that in the preparation of black draughts Epsom salts were used, which much resembled oxalic acid in appearance, and that the person who made up the draughts in question had possibly used the poison instead of the salts by mistake. Dr. Trail explained that the two draughts in question were the last of a stock he bought in November last from the former owner of the business. The jury consulted for half an hour, and eventually recorded an open verdict, thus leaving the matter in the hands of the police.—*Times.*

Attempted Suicide by White Precipitate.

At Stourbridge, on Friday, May 24th, Mary Kendrick, a prostitute, was charged with attempting to destroy her life by taking a quantity of precipitate powder. It appears that she had been drinking freely for two days previous, and went to the shop of Mr. Morris, chemist, and there purchased the powder, which she mixed up in some liquid and drank. Dr. Campbell was soon in attendance, and applied antidotes.

Mr. Y. Lewellyn, assistant to Mr. Morris, chemist, said the prisoner came to their shop, and asked for a pennyworth of precipitate powder to dress heads with. She asked for the strongest. He supplied her with it, and said the white was the strongest, and cautioned her, stating what it was, and labelled it "Poison."

Martha Kendrick, sister to prisoner, said that the prisoner had a quarrel with her mother, and said she would go and buy some poison and poison herself.

Prisoner, in defence, said she did not intend to poison herself; but had something the matter with her head, and, having had a quarrel at home, she took it. Was very sorry, and would not attempt to take her life again, if discharged.

She was committed to take her trial at the ensuing ssions.—*Stourbridge Observer.*

The following journals have been received:—The 'British Medical Journal,' June 1; the 'Medical Times and Gazette,' June 1; the 'Lancet,' June 1; the 'Medical Press and Circular,' June 1; 'Nature,' June 1; the 'Chemical News,' June 1; 'English Mechanic,' June 1; 'Gardeners' Chronicle,' June 1; the 'Grocer,' June 1; the 'Journal of the Society of Arts,' June 1; 'Grocery News,' June 1; 'British Journal of Dental Science' for June; the 'Milk Journal' for June; 'Longman's Notes on Books' for May 31; 'Florist and Pomologist for' June; 'Practitioner' for June; 'Educational Times' for June; 'Food, Water, and Air' for June; the 'Doctor' for June.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

Soothing Syrups.

Sir,—You state in last week's Journal that "most if not quite all soothing syrups, cordials and elixirs sold for the benefit of infants under the most amiable titles, contain opium." We beg to deny that this is the case as regards Mrs. Johnson's Soothing Syrup, of which we are proprietors; and to state that it is an exception to the rule you lay down, "that the whole tribe of infantile soothers belong to the tribe of poisons," inasmuch as our preparation does not contain opium, or any of its preparations, or any narcotic whatever. Mrs. Johnson's Soothing Syrup is not "a deadly poison and one which needs the utmost care and skilled vigilance to rob it of its danger when infants are compelled to swallow it," as it is not a medicine to be taken inwardly, but is only to be rubbed on the gums; and we repeat, contains no narcotic whatever—nor would any harm issue should the bottleful be administered by the nurse in mistake.

Barclay and Sons.

Farringdon Street,
June 3rd, 1872.

[*** The fact that Messrs. Barclay's Soothing Syrup is not a medicine to be swallowed obviously places it outside the class of preparations referred to in our article.—Ed. Pharm. Journ.]

Pharmacy at Home and Abroad.

Sir,—In the 'Journal de Pharmacie et de Chimie' for this month, I observe an announcement that has caused me certain painful reflections and humiliating comparisons. It is as follows:—"At Lyons, on the 18th September, 1872, will be opened a medical congress. This congress will be scientific and professional; it will last nine days. It will be composed of foundation members and ordinary members. Foundation members shall be doctors of medicine, *pharmaciens* and diplomaed veterinary surgeons." The programme to be discussed is purely medical.

How long will it be before a similar announcement will be possible in this country? Echo answers "how long," and I cannot be more definite. It would be safe, however, to venture a prediction that that day will not be hastened by the universal prevalence of the cheap and inefficient pharmaceutical education with which we are threatened, it seems, by the new Council.

Gamma.

May 31st, 1872.

W. Botham.—We have received the sample of your india-rubber valve for feeding-bottles, but are unable to publish any account of it except in the advertising columns.

F. Tebbutt sends a caution to the trade against the dishonest practices of two men, who have succeeded in some cases in robbing pharmacists. The plan they adopt is for one to withdraw the attention of the shopman to a pretended prescription, while the other perpetrates the theft.

J. H. Bland is thanked for his enclosure.

W. Bartlett is thanked for the information, which will be kept as a memorandum for future use.

J. Houlton has sent us a communication expressing his individual agreement with the statement in the advertisement of Winslow's syrup, that it is a real blessing to mothers and children, and giving some details of the quantity of that preparation sold by him. We are unable to see how this affects the argument of the editorial article of last week, which pointed out the advisability that such preparations should be so labelled as to indicate the necessity for using them with caution.

Communications, Letters, etc., have been received from Mr. J. Burt, Dr. F. Porter Smith, Mr. T. Stokoe, Mr. E. W. Howe, Mr. J. E. Lord, Mr. J. Wright, Mr. J. Thornton, Mr. J. Martin, Messrs. Kay Bros., Mr. C. R. C. Tichborne, W. F. C., R. J. M., "One who has Known," etc., "Tyro," "Photo," S. N.

THE MICROSCOPE IN PHARMACY.

BY HENRY POCKLINGTON.

(*Continued from p. 921.*)

JALAPA.—Tubercule or tuber of *Exogonium* (*Ipomœa*) *purga*. The general character of the tuber is sufficiently unlike the structure of the ordinary 'root' to make its inclusion here somewhat a digression, for which perhaps my readers will be thankful, as a relief from general tedium; the more so, as they will be saved from the technical description needful with many roots and the like. With the general characters of the jalap tuber, its appearance, colour, weight, and resinous fracture all pharmacists are familiar. These characters are all the concomitants of certain microscopic characters. The dark brown, almost black, colour of the exterior is confined to the cells of the layer immediately below the true epidermis. The cells of the epidermis are oblong in shape, much compressed, that is, *thin*, and have their front walls much thickened. The cells which contain the dark resinous colouring matter lie immediately below this, and are rounder in outline. Very considerable care and patience is needed to render these details visible in the dry tuber; in the form of powder they cannot be recognized at all; a few pieces of brown structure are all then discernible. The structure of the interior of the tuber is more characteristic, and may be described as being composed of a series of lamellæ, each of which consists in the middle of irregularly shaped cells with varying contents, and, on the exteriors, of more regularly shaped, more compressed parenchyma cells and vascular vessels, with exceedingly little pleurenchymatous and parenchymatous tissue. Some of the cells of this act as resin receptacula, others contain starch, and a few are nearly empty of all except the usual protoplasmic matter. The starch-bearing cells are irregularly hexagonal in shape, cell walls are thin and imperforate. The starch granules are large, vary much in size and shape, and lie loosely in the cells. They may be classed as aggregated and isolated granules. The aggregated granules usually consist of three triangular granules, the bases of the triangles being curved outwards, so that the resulting granule is muller-shaped, but approaching the circular. Many of the isolated granules are nearly circular, flattened, with a triradiate, indistinct hilum. These give a very distinct black cross by polarized light, the intersection of the arms of the cross lying on the hilum point. In the aggregated granules the cross is not so easily visible, as the hilum then lies towards the centre of the aggregation, and some care is needful to get out the cross by careful rotation of the upper and lower prisms as may be required. Taking the starch altogether, it will be found to be highly characteristic.

The resin cells are less regularly shaped than those which contain starch. The resinous contents are somewhat granular, usually dark in colour, and partially soluble in water, which consequently renders the mass more transparent. Vascular ducts are not numerous, and consist of large 'barred' vessels, often perforate in the older laminæ. The woody fibres are themselves almost 'vessels,' are pitted, and do not contain starch, nor usually resin or other products. In examining the structure of jalap, it will be well to bear in mind that the tubers are sometimes exposed to considerable heat in the process of drying, and that the form and general characters of the starch granules, resin cells, etc., are often much modified thereby.

The adulteration of powdered jalap may be expected to consist of an admixture with the stems and damaged roots of the true jalap and of the substitution of or admixture with the powder of *Ipomœa Orizabensis*. This may be detected by its greater proportion of woody fibre, but more certainly by chemical analysis. And, secondly, by admixture of entirely foreign matter. 'Powder of post' is, I think, not so commonly used as ten years since, but starch of various kinds and ground guaiacum chips are, it is said, commonly used still. Of the latter I have no personal knowledge, and am inclined to believe that the sole commonly current adulterants are starches of potato and arachis, stems of *I. purga* and damaged tubers, and tubers and stems of *I. Orizabensis*. The starches and stems would be easily recognized by aid of the microscope by one familiar with the structure of the true tuber, and for the rest recourse should be had to chemistry.

CALUMBÆ RADIX.—The structure of the root of this menisperm is very simple, and will not give us much trouble. It consists for the most part of cellular tissue, with a few vascular vessels, a little woody fibre, and a few laticiferous vessels. The cells of the parenchyma are somewhat large, with very thin walls, very irregular and variable in both size and shape. Their contents are large starch granules, very variable in size and shape; sometimes single, but generally aggregate. The single ones vary in shape from nearly round to mussel-shaped. The aggregate granules are usually muller-shaped. As might be expected, the form and situation of the hilum is as variable as the size of the granule. The normal form appears to be a longitudinal furrow, but a single point or a 3- or 4-radiate slit or furrow are collectively as common. The polarization phenomena vary with the shape of the granule and situation of the hilum; but in all the single granules a black cross is very marked when the prisms are crossed. In the case of the aggregate granules, some little care is necessary in order that the cross may be seen. This starch, which is, with all its variability, characteristic, requires considerable care in preparing it for the microscope, owing to the great delicacy of the investing membrane of the granules. Glycerine jelly with a larger proportion of glycerine than usual, or glycerine and gum-water, is the best medium in which to mount it permanently.

The *pitted vessels* are large, by no means numerous or regularly distributed, and do not present any points of special interest. The woody fibres are of the usual unpitted type. The cells of the cortical layer in nowise present marked characters. Special canals, composed of short cylindrical cells, occur at intervals in the tissue, and contain a yellow-coloured substance, probably in chief part calumbine.

Adulterations of powdered calumba chiefly consist of starches, woody fibre, etc. These would be easily detected, as no common starch resembles that of calumba; woody fibre in quantity would at once betray an adulterant.

SENEGÆ RADIX.—The medulla is doubtfully present in the majority of specimens. There are no medullary rays in the specimens that I have examined.* The *wood zone* is composed of pitted vessels and pitted-wood fibre, closely resembling each other in all save size. The walls of these are very thin, and in cross section the wood zone has a somewhat reticulated appearance. The pitting of the wood cells and vessels is minute, in the vessels oval and transverse to their long axis. The wood cells taper slightly towards their ends. No cell contents beyond colouring matter. The layers of the *cortical zone* present the usual characteristics. The cells are more regular than is frequently the case, and are somewhat cubical in shape. The inner layers of cells are starch receptacula. The starch granules range in size from an exceedingly minute, sharp-edged polyhedric granule to a medium size (sometimes very large) roundish but flattened granule. They all give a black cross with polarized light, but great care and practice in the use of high powers with polarized light are necessary to enable it to be seen in the smaller granules. Adulteration doubtful.

(*To be continued.*)

SUPPLIES OF OPIUM AND SCAMMONY FROM TURKEY.

BY P. L. SIMMONDS.

Continued from page 987.

SCAMMONY.—From an elaborate and carefully prepared notice of the scammonies of the Turkish empire, submitted to the jury at the Paris Exhibition in 1867, I am able to furnish some interesting and valuable data as to the characters and varieties of scammony shown from different localities, and the results of careful examinations and analyses made of them by Dr. Della Sudda (Fayk Bey). I will first, however, give the official return of the imports of scammony into the United Kingdom during five years.

Imports of Scammony from Turkey.

	Quantity.	Value.
1866 . .	9,886 lb.	£15,479
1867 . .	9,341	13,843
1868 . .	7,367	9,403
1869 . .	5,827	6,991
1870 . .	25,592	30,761

Scammony is the produce of many species of convolvulus, which require no culture, growing spontaneously on the mountains and slopes of hills in nearly all the districts of Asia Minor. They prefer a dry and stony soil, springing among the brambles and thickets, up which they twine. By the commencement of April the young shoots appear, and in May and June the plants are in their full vigour. July is the favourable time for collecting the juice, which is obtained from the roots, the stems being rejected as useless and inert.

The roots are cylindrical, sometimes twisted round themselves like cords. The cortical plant is rugous, lightish red or ashy grey, adherent. The interior is compact, whitish, studded with concrete small drops of a light yellow colour, and riddled with round pores visible to the naked eye. In the month of July the natives, furnished with spades, knives, mussel-shells and other receptacles, proceed to the mountains or localities favourable for their search. Arrived at a suitable locality, they commence with the spade to free the roots of all substances which surround them, brushwood, earth, stones, etc. to a depth of about three or four inches. When this is done, they cut the large roots at their junction with the stem of the plant, and hollow it out so that the milky juice ascends and concretes in this receptacle, and is easily collected into the shells.

In the smaller roots and in other places incisions are made, to allow the sap to exude and drop into the mussel-shell, where it coagulates. Formerly it used to be dried and retained in these shells, and was called scammony "*de première goutte;*" and this kind is even now occasionally met with in commerce, but it has fallen into disuse, and the shells are only used as first recipients of the juice.

What is known as scammony of the second drop is obtained by expression, which is carried on in the following manner:—The entire roots are taken up, cut into pieces and pounded, so as to obtain the juice easily. This when solidified, shaped into lumps and divided into irregular pieces, constitutes the principal part of the scammony of commerce.

This process is becoming more general, and would not be objectionable if care were taken to remove the vegetable substances before solidification, and the fraudulent practice of adding flour or other adulterants, under the pretext of rendering it more pure and merchantable in appearance, were omitted.

Authors differ much in their classification of scammonies and the names given; some would distinguish them by the place of origin, some by the variety of plant from which they are obtained, while others would range them according to the characters and physical properties which they possess. Each give such good reasons for justifying their opinions, that it is difficult to know which to follow. But the Director of the Central Civil and Military Pharmacy, Constantinople, who has had large and favourable experience for studying the subject, tells us that he has seen the same convolvulus furnish at Aleppo (a locality much vaunted) a scammony inferior to that of Rhodes, of Mount Lebanon and of Amassiah; that he has had under his hands scammonies of the same colour, the same appearance, presenting in a word identical physical characters, the one occupying the top and the other the base of the scale as regards the proportion of resin. In conclusion it may prove valuable to give a digest of his analyses of eighteen varieties of scammony and some few roots from different localities.

1. Rhodes.—This scammony was in the form of a flat cake, very friable, with a brown and vitreous fracture, studded here and there with grey spots, whitens with the saliva, gives neither to the taste nor after taste any bitterness, burns at the lamp with flame, and continues to burn some time when removed, if not extinguished. Resin 76·95 per cent. Residue starch and silica.

2. Kianguiri.—Scammony in small, irregular fragments, of a deep brown, fracture conchoidal, does not blanch with the saliva, burns without flame at the light with a slight sputtering. Resin 70·15. Residue, starch and silica.

3. Aleppo.—Scammony in fragments, rather large, of a greyish appearance on the exterior and a mixed brownish-grey in the interior, whitens with the saliva,

* It is worth while to mention that the upper portion of roots frequently have both medulla and medullary rays when these are absent in the lower portions of the root. When, therefore, I speak of the absence of medulla, I refer to the root, excluding its uppermost portion.

very resistant, fracture irregular and dull, only burns with a little flame when close to the lamp, and dies out when removed. Resin 49 per cent. Residue, starch, carbonates and silica.

4. Ismid.—Scammony of a yellowish-brown colour, blanches with the saliva, is very little friable, semi-transparent in thin sheets, burns without flame at the candle, and gives off an odour like burnt potato. Resin 39·82. The large proportion of residue shows abundance of starch, extractive matters, carbonates and silica.

5. Smyrna.—Scammony in irregular fragments, of a deep brown, very friable, irregular fracture, presenting cavities here and there, whitens very little with the saliva, burns with a flame at the light, but goes out on removal from it. Resin 61. Residue, starch, carbonates and silica.

6. Sivas-Amassiah.—This scammony arrived in the form of a great oval cake 18 centimetres long by 12 broad and 4 or 5 thick. The mass was compact, had a conchoidal fracture, purple-brown throughout, did not blanch with the saliva. The splinters had a dull yellow semi-transparent colour. Burns with flame and bubbles or spits at the light, soon extinguishes when removed, giving off from the ash a disagreeable odour. Resin 72. Residue, starch, carbonates, oxide of iron and silica.

7. Koniah, Gulnar.—Scammony in irregular fragments, some of a greyish brown, others of a dull grey, porous fracture, does not whiten with the saliva, burns at the light without flame, and speedily goes out with a disagreeable odour. Resin 55. Residue, starch, carbonates and silica.

8. Broussa.—Scammony in fragments of an ashy grey colour, a dull fracture, burning at the light without flame, blanching very little with the saliva. Resin 51. Residue, starch, carbonates in abundance, with a little silica.

9. Broussa, Yecaditz.—This scammony was received in the milky state, enclosed in a tin box well soldered; on opening, in consequence of excessive fermentation, it burst out in all directions. The juice was of a yellowish white, but darkened on oxidizing in contact with the air. Dried in a stove, it settled into irregular fragments of a bluish-black colour, with a brilliant fracture, very friable, blanched with the saliva, without having any bitter taste, burnt with flame and sputtering, but without odour. Resin 76 per cent. Residue, starch, vegetable detritus and carbonates.

10. Kutahiah.—Scammony in very irregular fragments of a deep grey colour, fracture dull and porous, whitens with the saliva, pretty friable when the piece was not too large, burns at the flame, and gives out a disagreeable odour, Resin 47·80. Residue, starch and silica.

11. Aleppo.—Scammony in irregular fragments, dull and porous fracture, of an ashy grey colour, blanches with the saliva, burns without flame and without any pronounced odour. Resin 66. Residue, starch and silica.

12. Angora.—This scammony was received in a small cup, in a very compact mass, which only yielded thin scales to the efforts of the knife, of a clear brown, whitening with the saliva, and burning at the light with flame. Resin 86. Residue, vegetable detritus, carbonates and silica, and traces of starch.

13. Angora.—Scammony in irregular fragments, of a clear brown, clean fracture, very friable, blanches with the saliva, burns at the light with flame and spitting, continuing illumined when removed from the light, and giving off a disagreeable odour. Resin 46·87 per cent. Residue, starch, carbonates and silica.

14. Gueive.—Scammony in irregular fragments, grey at the surface, black speckled with grey in the interior, very friable, bleaches with the saliva, burns at the light with flame and sputtering, but dies out when removed from the light. Resin 48·36. Residue, starch and silica.

15. Mount Lebanon.—This scammony was received in the shape of a round compact cake, of about 15 centimetres diameter by 3 thick; whitens with the saliva, burns without flame at the lamp, giving off a disagreeable odour. Resin 74·60. Residue, vegetable débris and carbonates, but no trace of starch.

16. Koniah-Antalia.—Scammony in irregular fragments of a deep grey colour, porous fracture, does not whiten with the saliva, burns without flame at the light, giving off a disagreeable odour. Resin 54. Residue, starch, carbonates and silica.

17. Skilip.—Scammony in irregular fragments, of an ash-grey at the exterior, and a dull brown at the interior, tolerably friable, does not whiten with the saliva, nor burn at the candle. Resin 36·14. Residue, starch and silica.

18. Houdavendiguiar.—Scammony in mussel-shell, known as "première goutte." Colour at the surface bluish-black, brown in the interior; it burns without odour or flame at the light, bleaches with the saliva. This scammony presents the same characters and properties as that described under No. 9, and when we find that they come from the same district, we may conclude that it is the same product sent in different forms. Resin 71. Residue, vegetable detritus, starch and carbonates.

I now have to speak of the composition of a few of the roots submitted to examination.

Bagdad-Himalaya.—Root of a yellowish-white, of the thickness of the wrist, very light, and presenting in some places considerable protuberances; bark rugose, and largely furrowed, detached easily in thin sheets superposed. The interior, which differs little from the exterior except in colour, presents ligneous fibres, separated by the destruction of the cellulose. This root appeared to be destroyed by larva, and dead at the foot; 100 grams pounded and treated with alcohol, gave no result.

Koniah.—This root was soft, of the thickness of the finger, of a madder-root colour, yellow and porous in the interior; 50 grams pounded and treated with alcohol gave a liquor which, on evaporation, yielded a residue composed almost entirely of extractive matters, agreeable to the taste, purgative in a dose of 1 to 1½ gram, but so hygrometric that, left in the dry state exposed to the air, it liquefied in a few hours. The only root met with of this kind.

Smyrna.—This root was long, straight, and of the thickness of the thumb, of a light grey at the exterior, and yellowish within, and presenting in the parts severed all the pores blocked up with resin, the portion taken being the centre, excluding the extremities; 62 grams pounded and treated with alcohol deposited, on evaporation, 7 grams 22 centigrams of a dry product composed of gum-resin and extractive matters, which, left exposed to the air, continued in the dry state. This resinous extract was found to be a good and mild purgative in the dose of 1 to 1½ grams. Resin 11·64 per cent.

Angora-Bozouk.—This root was of a madder colour exteriorly, and yellowish in the interior, cylindrical, 10 centimetres long by $2\frac{1}{2}$ in diameter; 40 grams of the pounded root treated with alcohol yielded 4 grams 20 centigrams (or 10·30 per cent.) of a purgative substance so hygrometric, that it became syrupy when exposed to the air.

Alep Isladé.—Root of a dark grey exterior, yellowish in the interior, ligneous and very porous; 50 gram of the root treated with alcohol gave a percentage of about 5·40 of a purgative product very hygrometric.

To summarize this inquiry, it is clear from the careful researches made, that the great difference in quality which exists between one kind of scammony and another, is due less to the nature of the soil, or the varieties of the plant which produce them, than to the defective modes of extraction of the milky juice, and the successive manipulations to which it is submitted.

A fact which is lost sight is that the root is long-lived, though the stem is annual, for it does not attain its full development till after the space of several years, and it is only after the third or fourth year of growth that the juice is completely saturated with gummy resinous substances. The extraction by expression is the most useful and practical.

By selecting the most healthy-looking roots, cleaning and cutting them, and submitting them to a gradual pressure in a canvas bag, two men will obtain in two days more than four will procure in eight days by the old method of incising the root.

CARBOLIC ACID AND CREASOTE.

BY PROFESSOR FLÜCKIGER, BERN.

A good plan for distinguishing these two substances is as follows:—

		Parts.
Take	*a*. Solution of Perchloride of Iron about 1·34 spec. gr.	1
	b. Creasote, that is to say, the liquid to be tested for Creasote	9
	c. Alcohol, containing about 85 per cent. of absolute Alcohol	5
	d. Water	60

Now $a+b$ mixed assume no peculiar colour.

$a+b+c$ furnish a green solution.

$a+b+c+d$ form a turbid mixture of a dingy brownish colour, drops of creasote being separated.

On the other hand, in the case of carbolic acid, suppose likewise,—

a. The above ferric solution, weighing equally	1
β. Carbolic Acid (phenol)	9
γ. Spirit of Wine, as above	5
δ. Water	60

Now $a+\beta$ will show a yellowish hue.

$a+\beta+\gamma$ yield a clear brown liquid.

$a+\beta+\gamma+\delta$ display a beautiful permanently blue solution, without separation of carbolic acid, or the few drops sinking down may be redissolved by shaking.

Mr. Th. Morson pointed out* that glycerine is also a good test for the purpose under notice, creasote being not or almost not soluble in that liquid, whereas, as it is well known, carbolic acid readily mixes in all proportions with glycerine. This notice, however, requires, I beg to observe, a slight modification. True creasote, which stands the above test, is perfectly miscible in any proportion with anhydrous or nearly anhydrous glycerine, but it is not so with a somewhat diluted glycerine; a clear solution of creasote and of the same weight of anhydrous glycerine becomes turbid on addition of a little water, whereas a similar solution of carbolic acid may be diluted with water without separation of carbolic acid.*

The blue colouration of carbolic acid, due to perchloride of iron, enables us to discover it when mixed with creasote, but not to prove the presence of creasote in carbolic acid. The latter question, however, seems to me of less practical importance; yet, creasote, if present to some extent, would quickly separate in the above process, $a+b+c+d$, if more water be added. For this purpose the addition of perchloride of iron would be useless.

* Pharm. Journ., May, 1872, p. 921.

* The glycerine employed by Mr. Morson was the ordinary distilled glycerine of commerce, and he considers the advantage of the test suggested by him to consist in its simplicity and easy application.—Ed. Pharm. Journ.

CHINESE CHEMICAL MANUFACTURES.†

BY F. PORTER SMITH, M.B.

There is a body of men in China called Taouists, the professed followers of *Lau-tsze*, the great philosopher of China. Their studies have embraced every department of knowledge, including especially the subject of alchemy, as an art and as a science. The Rev. J. Adkins, a veritable Christian Taouist, pointed out in a communication made to the Hongkong Branch of the Royal Asiatic Society in the year 1855, that alchemy was pursued as a practical study for two centuries (?) before the Christian era, and for several centuries after that period. He argues from the facts that, as the Chinese were possessed of this knowledge long before alchemy was studied in the West, and the Arabian or Mohammedan traders who were the reputed discoverers of this art, had frequent and early intercourse with China by land and by sea, this interesting branch of knowledge was borrowed from the Chinese as the first professors of this true science. In the pursuit of some flux by which the dross of animalism was to be purged away, and the higher part of man's nature to be crystallized out and sublimed into some stable and eternal form, these Taouists practised fasting, discipline, worship, the use of charms, and the search for a sovereign remedy for all the ills of life. More essentially Chinese than the followers of Confucius, these students of nature started with the study of that oldest scientific book in the world, the *Yih King*, or Classic of Changes, hoping to wring from it some reply to their deep-searching cry for the truth as it is in nature.

Referring to the 'Notes on Chinese Literature' by Mr. Wylie, we gather that the earliest work now extant on the subject of alchemy is the *San-t'ung-k'i* by *Wei Peh-yang* of the second century after Christ. *Koh-hung*, better known by the name of *P'au-p'oh-tsze*, who lived in the *Tsin* time, during the close (in the early part of the fourth century after Christ) of that dynasty, was a voluminous author on alchemy, materia medica and other kindred subjects. He is largely quoted in the *Pen Ts'au Kang Muh* as an authority on chemical and medical subjects. Many other authors have included the subject of transmutations in their writings.

As the result of these researches, pursued with all perseverance, but no success in finding the Elixir of Life or the Philosopher's Stone, the Chinese of the

† Reprinted from 'Transactions of the North China Branch of the Royal Asiatic Society.'

present day have a number of exceedingly simple and economical processes by which they obtain tolerably pure mercurial and other preparations, of the greatest service even in their now unskilled hands. Their apparatus is of the very rudest character, and their materials are often of the most unexpected kind, but with these they can manufacture calomel and vermilion of the most beautiful description.

The manufacture of enamels and porcelain formed another field of chemical research, carrying them to the same effective results, produced they knew not how or why. The taste for colouring vessels, walls, scrolls, and some few other objects led them to the study of the metals iron and copper, from which they extracted red and blue pigments. The manufacture of fire-works has been also a means of increasing their chemical knowledge. These artists, called *Yen-ho-kia*, learnt the use of iron, camphor, and other secret substances, by the addition of which the flame is altered or intensified. It has been long known to these numerous manufacturers that by the addition of a small quantity of arsenic, the noise of crackers is rendered much louder and sharper. The preparation of pigments for artists, of whom there are described in authentic works some 1607 celebrated names, has been a stimulus to the manipulation of minerals. To this day the Chinese White is to be found in the colour-artists' shops all over Europe as the best pigment of that description. The manufacture of ink, that most potent agent, has led to several curious observations of a chemical nature, of which more presently.

Much trouble is often taken by members of the Sinological order to invent new names for old things to China. Chemists have been known for hundreds of years in Chinese works as *Tan-lu-kia*, or *Tan-tsau-kia*. The name *Tan-kia*, a shortened form, as well as the other terms, is applied in works to what may be called the manufacturing chemists of China.

A very fair chemical nomenclature may be constructed out of the plentiful terms quoted in the *Pen Ts'au* from the writings of these alchemists and physicians. *Tan* stands for oxides, when preceded by some specific character. This word does not mean exclusively a red substance, such as cinnabar, but may mean some yellow, white, or red preparation. The dot in the centre of the character stands for the fire, that servant of the alchemist, and the rest of the character, sometimes written in the inverted form with the legs turned up, will do for the furnace, or crucible of the operator. *Fan* is the equivalent of the old chemical word vitriol, or a sulphate. Other similar terms may be found to express many conditions of inorganic matter, by those willing to search for them. Something like a hint at testing substances is found in the *Pen Ts'au*, where the antipathies of drugs are treated of. The extrication of ammonia when lime is heated along with sal ammoniac, the discoloration of silver and salts of lead by sulphur, and other instances might be adduced as evidence of some vague notions of the reactions of chemical substances. Something like an attempt at the statement of the equivalent composition of substances is seen in one of the names of Æthiops Mineral, sometimes called *Rh-k'i-sha*, or the "two-natured salt."

It will be better now to proceed to the particular discussion of the subject in hand—"Chinese Chemical Manufactures,"—by taking them in detail.

In the making of gunpowder the Chinese have practised a good deal of chemistry unconsciously. The manufacture of nitrate of potash from the efflorescent salts which are found on the surface of the soil, and on walls and places charged with urine, is carried on on a large scale in China. The properties of sulphur are well known to Chinese writers. It is procurable in large quantities from the sulphur pits near Tamsui and Kelung in Formosa, as lately pointed out by Mr. Taintor in the Customs' Reports for 1869. The red amorphous sulphur, called *Shih-ting-chi*, probably produced by the accidental mixture of some fatty substance with the ordinary brimstone of commerce, is fairly described in Chinese works. The composition of Chinese gunpowder, called by them "fiery medicine," is not very different, in some cases, from that of English powder. The charcoal of the willow and the *Cunninghamia sinensis* or Chinese Pine, is used in the manufacture. The Chinese are aware of the disinfecting and insecticidal powers of sulphur and arsenic. They enter into the composition of pastilles for getting rid of mosquitos, and the good effects of the gases resulting from the burning of crackers as expellers of evil influences are appreciated by the Chinese in some quarters. The alkalies soda and potash are turned to some account, although nitre and soda, or natron, are often confounded together. Carbonate of soda is brought from Mongolia, where the soil is charged with this alkaline substance, and requires no manipulation to render it useful as a means of raising bread. Potash, or pearlash, obtained by burning the rank herbage of inland districts is also to be met with in China. Tsi-nan-fu in Shantung is, or was, the seat of this rough manufacture. Both of these alkalies are used in Pehchihli to make a coarse soap, a branch of chemical manufacture which might be well taken up by the Chinese, and subsidised by Missionary Societies. Ferrocyanide of potassium, a beautiful yellow salt, is made in Canton, and by Cantonese in other parts of China, by burning dry refuse of animal substances, such as horn-parings, to a red heat with pearlash and a quantity of iron filings in a covered crucible. The process is kept a profound secret, as far as possible. The importance of this salt, sometimes called yellow prussiate of potash, is its employment along with alum and sulphate of iron to make that beautiful dye prussian blue—called "foreign indigo" by the Chinese, who largely wear the livery of this Conservative colour.

(*To be continued.*)

THE DISTINCTIVE CHARACTERS OF RHUBARBS.

BY DR. CAUVET, PHARMACIEN MILITAIRE.*

Conscientious pharmacists, who prepare their own powdered rhubarb, know how difficult it is to distinguish between the true Chinese rhubarb and the root obtained in Europe by the culture of various species of *Rheum*. The dealers in these false rhubarbs prepare them with so much skill that they may be easily mistaken for exotic rhubarbs of superior quality. The points of resemblance, however, are superficial, all on the exterior; for, although it is possible to dress a root so as to give it the appearance of a true rhubarb, it is not easy to modify its structure, and all the indigenous rhubarbs, whatever may be the species cultivated and the care bestowed upon their cultivation, present the Rhapontic structure.

During a sojourn at Toulouse a pharmacien of that city submitted to the author a specimen of some rhubarb that he had received from a house of undoubted respectability, but with which, despite its handsome appearance, he was not satisfied. It resembled the variety of China called "flat," and its only apparent fault was that it was a little soft and did not crackle between the teeth so much as rhubarb of good quality. After removing the fine powder by which it was covered, it was noticed that its superior or convex surface did not present the white lines arranged in a delicate network that are seen in the true rhubarb, and that its inferior or flat surface was devoid of the characteristic stars that are always found in the Russian, and more rarely in the Chinese varieties. The absence of these two characters seemed to point to

* Memoir read before the Paris Société de Pharmacie, March 6th, 1872; (*Journ. de Pharm. et de Chimie* [4] vol. xv. p. 275).

a false rhubarb, and an examination of its structure was therefore made.

The root was sawn transversely across, and the section smoothed with a knife; it was then wiped lightly to remove the dust, and moistened with a few drops of water. Upon comparison then with a specimen of genuine Chinese rhubarb it was evident that it was obtained from a different source.

The following are the principal points of difference between the French indigenous, the Russian and the Chinese rhubarbs:—

French Indigenous Rhubarb.—A transverse section presents a rayed aspect, formed of alternate white and red lines, proceeding from the centre to the circumference, the white lines being a little larger than the red. Just

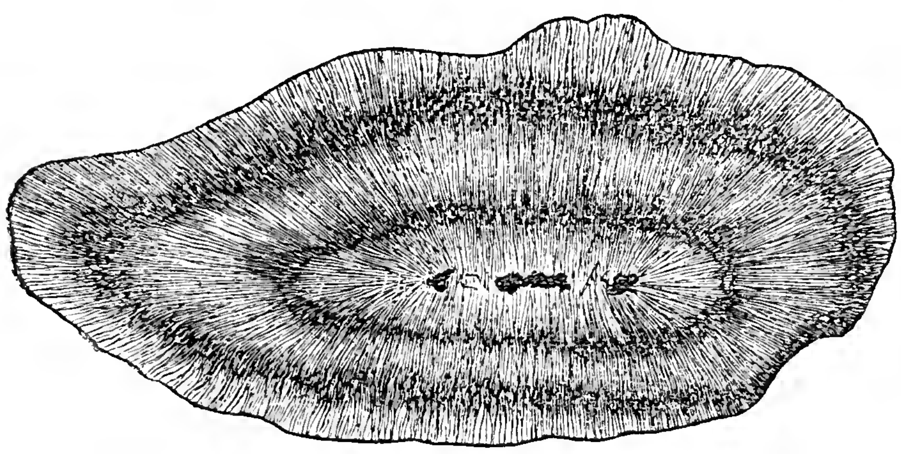

Fig. 1. French Indigenous Rhubarb: transverse section, natural size.

before reaching the circumference in circular pieces, or close to the edge in flat pieces, the radiating lines are cut by a brown zone, circular in the first, more or less interrupted in the second, but always visible.

Russian Rhubarb.—The transverse section of this root exhibits yellow lines upon a white ground, distinct, some times anastomosing, long or short, sinuous, often broken by radial systems. These star-like forms are circular or lengthened, and of variable size; their rays, clear yellow near the centre, become brown as they approach the circumference of the star, where they are generally of a very dark tint. As in the Rhapontic, the yellow lines run from the centre to the circumference; but this direction is ordinarily masked by the interposed radial systems and the flexuosity of the lines.

Chinese Rhubarb.—A transverse section shows light yellow rays proceeding from the centre to the circumference, and describing very flexuous lines. These lines appear often to anastomose, and form in the apparent anastomosis a sort of irregular star, the exterior side of

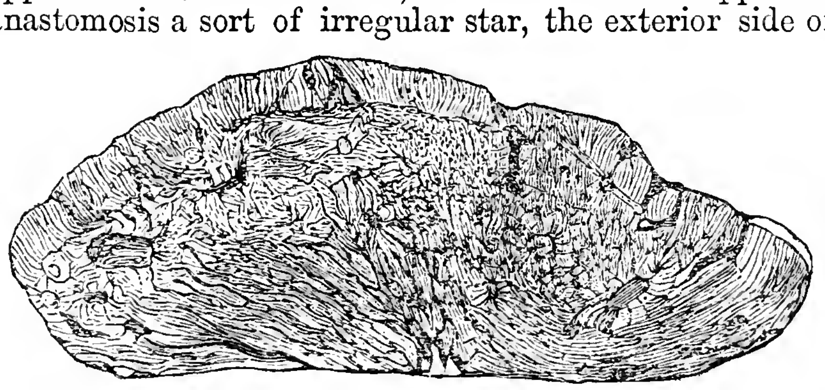

Fig. 2. Chinese Rhubarb: transverse section, natural size.

which is furnished with a greater number of rays than the interior. This disposition is seen principally in the cambium, and arises from the multiplication of the rays of the ligneous layer, which may be easily seen by means of a magnifying glass. As in the Russian rhubarb, the intervals between the rays are sometimes occupied by stars; but these are less numerous, less distinct, smaller and without the brown or blackish circle that characterizes the others.

If these three descriptions be compared, it will be seen that the French indigenous or false rhubarb is distinguished from the exotic or true by—

(1). The rectilinear disposition of its rays, which go from the centre to the circumference.

(2). The presence, upon its circumference, of a brown zone, relatively large and especially very distinct.

(3). The absence of the radiated systems (stars), so numerous in the Russian rhubarb, less frequent, but always easy to recognize in the Chinese.

In order to render these descriptions more easily comprehended, two engravings are given, one representing a transverse section of the French indigenous rhubarb, the other a transverse section of the Chinese. As the aspect of the latter varies with every root, and every piece of a root, it is only possible to represent its general appearance. On the contrary, the structure of the indigenous rhubarb varies so little that it is only necessary to examine one section, bearing in mind that the brown zone will be complete or not according as the specimen is an entire one, or only a portion of a root, or that it has been little or much cleansed.

LIQUOR FERRI DIALYSATI.

BY PROFESSOR G. DRAGENDORFF,

(Dorpat, Russia.)

I prepare the above in the following manner, which mainly is only a modification of the method of Grossinger:—By mixing 300 c. c. liquor ferri sesquichloridi of sp. gr. of 1·37, and 100 c. c. of caustic ammonia, sp. gr. 0·92, a mixture is produced, which after standing one or two hours, becomes perfectly clear and dark brown. It contains ammonic chloride and ferric hydrate dissolved in ferric chloride. From this mixture, subjected to dialysis, ferric chloride and ammonic chloride pass into the outer liquid, leaving upon the dialyser a brown solution of the colloidal ferric oxide. The latter is perfectly tasteless, and, as was shown by Graham, capable of being produced perfectly free from ferric chloride. (For 30·3 eq. of ferric oxide=Fe_2O_3 (Fe=28), he had 1 eq. HCl. Annal. d. Ch. and Ph., vol. 121, p. 1.)

This solution is used successfully under the above name, and it only devolves upon us to bring it to a definite volume, to render at least an approximate determination of a dose possible for the physician. This is the main difficulty in the way of preparing this substance.

The solutions of the colloidal ferric oxide possess, as has already been mentioned by Grossinger, immense powers of attraction for water. In the dialysing drum, as I used to employ it, made of parchment paper, I always observed, even if the level of the liquid within the dialyser was half an inch higher than that of the external water, not only a strong outward current into the water, but also the reverse from the water into the dialyser. In other words, the contents of the dialyser possessed a great tendency toward dilution from absorbed water. I hardly succeeded in obtaining solutions of ferric oxide containing over 4·5 per cent. Fe_2O_3+3HO, some containing only 1·5 per cent. I was forced, therefore, to abandon the previously used dialysing drum, and to place the iron solution into a pig's bladder, washed with dilute potash lye and then with distilled water. The bladder is filled through a funnel and then tied tightly as possible, so as to be almost completely filled by the solution. The better this is done the less water will enter the bladder during diffusion, and the more concentrated the liquor will remain. In this manner I succeeded in producing a preparation containing 7 per cent. of the ferric trihydrate. The great tendency of the contents of the dialyser to absorb water may be seen by firmly tying the opening of the bladder around a glass tube four or five feet high. In this the liquid will rise several feet above the level of the dialyser. The bladder containing the iron solution is suspended in a cylindrical glass vessel, with its upper portion about an inch below the level of the water, the quantity of which in the outer vessel should be at least four or five times that of the iron solution within the bladder. This exterior water is changed during the first few days every twelve hours, and later, every twenty-four. Well-water cannot replace distilled water during the first few days. The first diffused liquors, rich in ferric chloride, can be employed for the precipitation of the ferric oxide. The diffusion is continued with distilled water until, after one lasting twenty-four hours, nothing is dissolved, which upon the addition of nitric acid will be precipitated by argentic nitrate. In ten or fourteen days this result will be achieved. The iron solution contained in the bladder I suggest to dilute to 1000, when it will contain about 5 per cent. of the ferric hydrate of the above composition. Should too much water have entered the bladder, the liquor may be concentrated in a water-bath (or better, air-bath), at a temperature of 60° or 70° C. In most cases, part of the colloidal ferric oxide will during this process be changed to the normal oxide, and will separate.

The liquor ferri dialysati is best used without any addition, which is easily possible, as it is tasteless. Its dilution is only permissible with distilled water. Well-water at once causes a precipitate of the ferric oxide. Even the patient using the iron should drink distilled water afterwards, if he thinks it at all necessary. If the preparation is to be sweetened, this may be done with simple syrup. Sufficient white sugar may also be added to produce a syrup, but the solution of this sugar must take place at the ordinary temperature. If the solution is attempted at an elevated temperature, frequently a part or all the ferric oxide will separate from the solution, especially if the sugar be not perfectly white and free from lime.

The liquor ferri dialysati keeps well. I have preserved a sample solution of the same over four years, without having noticed any change. Also a sample of *syrupus ferri dialysati*, prepared by dissolving 120 parts of powdered sugar in 75 parts of the liquor, I have kept for several years without any apparent change. Grossinger has already called attention to the stability of such a syrup. I claim a superiority of these solutions of dialysed iron over those prepared by Hager's method, as mine contain less ferric chloride than Hager's. His proportion between muriatic acid and iron is 13 : 7. For children and weakly persons, I deem my preparation more useful.

A liquor *ferri phosphorici dialysati*, I prepare by mixing an aqueous solution of the officinal sodic phosphate with an aqueous solution of ferric chloride, and subsequent diffusion. After completion of this process a light brown solution is obtained, containing 3 per cent. ferric phosphate. The proportion of ferric oxido and phosphoric acid was established as 3 eq. to 1 eq.

This solution also is tasteless, and may be especially applicable for therapeutic use, possesing the merit over the solutions of ferric phophate ordinarily used of containing common orthophosphoric acid *i. e.*, phosphoric acid in the shape in which the animal body can best assimilate it. Also from this liquor I prepared a syrup by the addition of sugar in the above proportion. But this commenced to show decomposition in about two weeks. The liquid became gelatinous, and acquired an inky taste. After three or four months numerous algæ were found in the mixture.—*The Chicago Pharmacist.*

CONTRIBUTIONS TO THE HISTORY OF THE OPIUM ALKALOIDS.

BY C. R. A. WRIGHT, D.SC.

(*Concluded from page* 992.)

IV. *Action of Sulphuric Acid on Codeia and its Polymerides.*

The results detailed in the previous sections show that the action of sulphuric acid on codeia is to polymerize it, with the formation of di-, tri-, and tetracodeia, the substances obtained by Armstrong and by Anderson by this means being identical with the first and last of these bases; it appears probable that tetracodeia may be formed by the further polymerization of dicodeia, whereas it would seem as though tricodeia were not likely to be obtained from dicodeia; on the other hand, it is possible that tetracodeia is directly produced from codeia, and that it could not be formed from dicodeia. To settle this point, pure dicodeia was heated to very gentle ebullition with sulphuric acid diluted with its own bulk of water for five hours, the operation being conducted in a long-necked flask so that no appreciable concentration by evaporation took place. At the end of this time the dicodeia was wholly converted into a base, of which ether dissolved only traces; hence no tricodeia was formed. After precipitation by Na_2CO_3 and drying, the free base was dissolved in alcohol and fractionally precipitated by ether. If the alcoholic solution be nearly free from water, the ether throws down solid amorphous flakes; but if ten or more per cent. of water be present, the ether precipitate is a tarry fluid containing water, alcohol, and the base. Flakes of tetracodeia were thus obtained identical in all respects with that obtained by the action of phosphoric acid; a trace of some product of the further action of sulphuric acid appeared to be present, however, as the free base turned slightly green on drying, without, however, absorbing so much oxygen as to make any appreciable difference in its composition. Dried at 100°, 0·221 grm. gave 0·583 CO_2 and 0·142 H_2O.

	Calculated.		Found.
C_{144}	1728	72·24	71·94
H_{168}	168	7·02	7·14
N_8	112	4·68	
O_{24}	384	16·06	
$C_{144}H_{168}N_8O_{24}$	2392	100·00	

If the action of sulphuric acid be pushed further than this point, a smell of SO_2 is perceptible, and the product obtained rapidly oxidizes on precipitation by Na_2CO_3 and exposure to air. Nothing fit for analysis was obtained from the product, which probably is formed by the dehydration, oxidation, and possibly de-methylization of tetracodeia.

V. *On the Physiological Action of the foregoing Polymerides. By* REGINALD STOCKER, *M.B., Pathologist in St. Mary's Hospital Medical School.*

An aqueous solution of the hydrochlorate of codeia and its polymerides was in each case employed, being subcutaneously injected into adult cats (a dog being also employed in a few experiments), quantities equivalent to 0·1 grm. of the anhydrous salt being used in each experiment. Four cats were employed, several trials being made with each animal, and three or four days being allowed to intervene between each experiment, so that the effects of one dose had entirely passed away and the animal entirely recovered before the administration of another dose. The main results observed were as follows:—

Codeia.—Four experiments. In each instance dilated pupils; cerebral congestion (determined by ophthalmoscopic examination), and much increased reflex excitability (epileptic convulsions in one case); salivation and purging in two cases; vomiting not produced in any case.

Dicodeia.—Two experiments. In each instance vomiting; fundus of eye not congested; pupil dilated in one case.

Another experiment with a dog (full-grown she-terrier) produced salivation and purging without vomiting; no cerebral congestion.

Tricodeia.—Three experiments. In each case salivation (profuse) and dilated pupils; no cerebral congestion; in one case slight excitement; in the others purging and depression; vomiting produced in one of these two latter instances, micturation in the other.

Tetracodeia.—Four experiments. In each case profuse salivation, micturation and depression; dilated pupils in three instances, and lachrymation in two; in one case vomiting and purging; in another increased reflex excitability with an occasional convulsion (cat was weak and not in good condition); slight hypnotism in two cases.

In two experiments with the dog, salivation and depression only were produced.

From these results it would appear that codeia produces cerebral congestion and increased reflex excitability without vomiting; whilst di- and tetracodeia produce profuse salivation and some depression, with vomiting in several instances; no evidence of cerebral congestion and but little of increased reflex excitability being noticeable.

VI. *Conclusions.*

The foregoing results suggest the probability of other bases being capable of forming similar polymerides. In anticipation of this result experiments are in progress with morphia.

Hesse has shown that by the action of HCl on thebaine, there are produced two isomerides of that base, one forming crystalline salts, one amorphous salts; not improbably these are respectively dithebaine and tetrathebaine.

Matthiessen and Foster have shown that cotarnine occurs in crystals of the formulæ—

$$C_{12}H_{13}NO_3+\tfrac{1}{2}H_2O \text{ and } C_{12}H_{13}NO_3+H_2O;$$

and the writer's observations indicate that the former substance is more stable than the latter, which rapidly become more or less coloured; not improbably these two forms are polymerides, the first being $C_{24}H_{26}N_2O_6+H_2O$, the second $(C_{12}H_{13}NO_3)n\ nH_2O$. Opianic acid, on heating, furnishes an anhydride of formula $C_{40}H_{38}O_{19}$; this tends to show that the formula of this acid is not less than—

$$C_{20}H_{20}O_{10};$$

not impossibly, therefore, the formula of narcotine may

Reagent, etc.	Codeia.	Dicodeia.	Tricodeia.	Tetracodeia.
Alcohol.	Soluble.	Soluble.	Soluble.	Soluble.
Ether.	Soluble.	Soluble.	Soluble.	Insoluble.
Character of base.	Crystalline, stable in the air.	Amorphous, stable in the air.	Amorphous. Very slowly oxidizes while moist.	Amorphous. Very slowly oxidizes while moist.
Character of hydrochlorate.	Crystallizes with $2H_2O$ for C_{18}; not lost at 100°.	Crystallizes with $3H_2O$ for C_{18}; lost at 100°, and partially at lower temperatures.	Non-crystalline, extremely deliquescent.	Non-crystalline, deliquescent.
Ferric chloride.	Nil.	Nil when pure.	No colour at first, reddish-purple on standing.	Reddish-purple colour immediately.
Nitric acid.	Light orange.	Light orange.	Blood red.	Blood-red.
Potassium dichromate and sulphuric acid.	Nil.	Nil.	Evanescent red.	Evanescent red.
Sodium carbonate and solution of hydrochlorate.	No immediate precipitate, crystals on standing.	Instantaneous amorphous precipitate but little soluble in excess.	Same as dicodeia.	Same as dicodeia.
Caustic potash and solution of hydrochlorate.	Oily precipitate if concentrated, becoming crystalline on standing. Not markedly soluble in excess.	Oily precipitate if concentrated, not becoming crystalline; more dilute solutions give a white amorphous precipitate soluble in large excess.	Same as dicodeia.	Same as dicodeia.
Action of hydrochloric acid not pushed to extreme.	Product contains Cl for C_{36}; further action contains Cl_2 for C_{36}.	Product contains Cl for C_{72}.	H_2O removed for C_{18}; no basic Cl contained in product.	Nil.
Action of hydriodic acid in conjunction with phosphorus, not pushed to extreme.	Polymerizes with elimination of CH_3 for C_{18}, forming bases derived from $(C_{17}H_{21}NO_3)_8$, H_2 being added on for C_{17} in product.	Polymerizes with elimination of CH_3 for C_{18}, forming bases derived from $(C_{17}H_{20}NO_3)_8$, H being added on for C_{17} in product.	—	CH_3 eliminated for C_{18}; product derived from $(C_{17}H_{19}NO_3)_8$, *no* H being added on, but simply I substituted for OH.
Action of sulphuric acid, not pushed to extreme.	Polymerizes, forming successively di-, tri-, and tetracodeia.	Polymerizes, forming tetracodeia.	—	Nil. Further action probably dehydrates and oxidizes.
Formula inferred from above properties and reactions.	$C_{36}H_{42}N_2O_6$.	$C_{72}H_{84}N_4O_{12}$.	$C_{108}H_{126}N_6O_{18}$.	$C_{144}H_{168}N_8O_{24}$.
Physiological action of 0·1 grm. of anhydrous hydrochlorate subcutaneously injected into adult cats.	Extreme hypersensitiveness and cerebral congestion, dilatation of pupils; no diarrhœa; no vomiting in any instance.	No hypersensitiveness nor cerebral congestion; dilatation of pupils; vomiting in every instance. With a dog profuse diarrhœa without vomiting.	Hypersensitiveness scarcely marked; vomiting in some instances, in others salivation and defæcation.	No hypersensitiveness; vomiting, salivation, or diarrhœa in every case; great depression. With a dog profuse salivation and depression.

be double that usually ascribed to it; from their physical properties it is not improbable that the dimethylnornarcotine, methylnornarcotine, and nornarcotine of Matthiessen may be derivatives not of ordinary narcotine, but of its polymerides.

The different modifications of the cinchona alkaloids are not impossibly polymerides of one another.

The preceding Table exhibits the principal differences between codeia and the polymerides above described.

PUTREFACTION.

BY DR. F. CRACE-CALVERT.

An investigation into the origin and causes of putrefaction, and the modifications to which the phenomenon is subject under varying circumstances has for some time engaged the attention of Dr. Crace-Calvert, and in a series of papers recently read before the Royal Society are recorded some of the results attained, which present many points of great interest.

That a solution of albumen from a new laid egg, in pure distilled water, sealed from contact with air, presents no signs of protoplasmic life, after being kept some time while the same solution when exposed to the air for a short time, contained globular bodies having independent motion, had previously been stated by the author, but he has now pushed this inquiry further, and found that the rate of development of vibrio-life is proportional to the extent of surface exposed. The relations in which atmospheres of different gases stand to the development of vibrios have been tested by placing equal quantities of a solution of albumen in Manchester water into five glass bulbs, leaving one exposed to the air for twenty-four hours, passing either oxygen, hydrogen, nitrogen or carbonic acid over the others, and afterwards hermetically sealing them. The bulb containing oxygen speedily became turbid, then that containing air; the other three remained clear. On opening them, in the tubes containing air and oxygen, vibrio-life was found to be plentiful; in those containing nitrogen, carbonic acid and hydrogen the quantity was small,—in the hydrogen least,—apparently proving that oxygen is an essential element in the production of putrefactive vibrios. The animalcules themselves when kept in closed tubes seem to produce sufficient carbonic acid and other gases to exclude oxygen and arrest their own development, but their activity returns upon fresh contact with air.

The following is, according to Dr. Calvert, the *order* in which the development of this low order of life takes place. A few hours after the impregnation of albuminous fluid, "monads," $\frac{1}{128000}$ of an inch in diameter, appear to form in masses. These are gradually changed into "ordinary vibrios," at first attached to the mass, although having independent motion, but ultimately separating and each vibrio, in size about $\frac{1}{20000}$ in., enjoying a distinct existence. These gradually grow into "long vibrios," $\frac{1}{6400}$ in. in length. The "long vibrios" are in their turn changed by a process of subdivision into what appear to be nothing more than cells, which have considerable swimming powers. When this process is completed (in about twelve or eighteen months), it is found that a deposit has been formed appearing under the microscope to consist of shoals of particles of matter having no life, and the solution has become clear, possesses considerable refractive power, and is no longer coagulable by heat. No putrid odour is emitted by the solution until after the above deposit is formed, and the odour is in direct ratio to the number of vibrios present.

Another series of experiments was undertaken by Dr. Calvert to ascertain the relative power of various substances in preventing putrefaction and the development of protoplasmic and fungus life. Small test tubes were thoroughly cleansed, and 26 grams of solution of albumen placed in each, together with ·026 gram of the substance the action of which it was wished to ascertain. These tubes were kept in a room at a temperature of from 12·5° C. to 15·5° C., and every day a drop from each tube was examined under a microscope. The following is a summary of the results:—

	Days required for development of Fungi.	Vibrios.
1. *Standard Solutions.*		
Albumen kept in laboratory for comparison	18	12
Albumen exposed outside laboratory	None	5
2. *Acids.*		
Sulphurous acid	21	11
Sulphuric acid	9	9
Nitric acid	10	10
Arsenious acid	18	22
Acetic acid	9	30
Prussic acid	None	9
3. *Alkalies.*		
Caustic soda	18	24
Caustic potash	16	26
Caustic ammonia	20	24
Caustic lime	None	13
4. *Chlorine Compounds.*		
Solution of chlorine	22	7
Chloride of sodium	19	14
Chloride of calcium	18	7
Chloride of aluminium	21	10
Chloride of zinc	53	None
Bichloride of mercury	81	None
Chloride of lime	16	9
Chlorate of potash	19	17
5. *Sulphur Compounds.*		
Sulphate of lime	19	9
Protosulphate of iron	15	7
Bisulphite of lime	18	11
Hyposulphite of soda	18	11
6. *Phosphates.*		
Phosphate of soda	17	13
Phosphate of lime	22	7
7.		
Permanganate of potash	22	9
8. *Tar Series.*		
Carbolic acid	None	None
Cresylic acid	None	25
9. *Sulphocarbolates.*		
Sulphocarbolate of potash	17	18
Sulphocarbolate of soda	19	18
Sulphocarbolate of zinc	17	None
10.		
Sulphate of quinine	None	None
Picric acid	19	17
Pepper	None	8
Turpentine	42	14
11.		
Charcoal	21	9

In a similar series of experiments where gelatine was substituted for albumen, the standard solution contained far more abundant life during the 47 days that observations were made, and a distinctly putrid smell was emitted after 26 days. With bleaching-powder introduced, life did not appear until the twentieth day, and at no time was it abundant; no putrid odour being detected, and only a mouldy one on the thirtieth day. With chlorine solution, vibrio-life was observed only after forty days, and no putrid or mouldy smell at any time. With protosulphate of iron, neither protoplasmic nor fungoid-life appeared. With arsenious acid, animal life appeared after two days, but at no time were there any fungi. With the other substances the results were much the same as in the albumen series.

Finally a series of experiments was undertaken to ascertain the effect of the same substances in solution of albumen already swarming with microscopic life. It was found that cresylic acid immediately and completely destroyed the locomotive power of the vibrios. Carbolic acid, sulphate of quinine, chloride of zinc and sulphuric acid nearly destroyed the locomotive power of all the vibrios present. Picric acid and sulpho-carbolate of zinc left only a few that retained the power of swimming, but allowed them gradually to increase in number. Chloride of aluminium, sulphurous acid and prussic acid acted injuriously at first, but after sixteen days the solutions contained as much vibrio-life as the standard putrid albumen. Bleaching-powder, bichloride of mercury, chlorine solution, caustic soda, acetic and nitric acids, sulphate of iron, and the sulpho-carbolates of potash and of soda acted injuriously at first, but afterwards allowed the vibrios to increase more rapidly than in the standard albumen solution. Arsenious acid, common salt, chloride of calcium, chlorate of potash, sulphate of lime, bisulphite of lime, hyposulphite of soda, phosphate of lime, turpentine and pepper exercised no action upon the animalcules. Lime, charcoal, permanganate of potash, phosphate of soda and ammonia favoured the production of animalcules and promoted putrefaction.

THE SCIENTIFIC RELATIONS OF GERMANY, FRANCE, AND ENGLAND.

BY M. BERTHELOT.

In a remarkable article recently published in the *Temps*, by M. Berthelot, upon the relations that should exist between Germany and France, he argues that the great scientific results which have been attained in the past by the joint efforts of the scientific men of Germany, France, and England, are evidence of the importance to mankind of their still working in concord. We extract some of the principal passages:—

We know that modern civilization depends upon three nations, which should at all times and at any cost remain united,—namely, France, Germany and England, each with its peculiar genius and its share in the historic development of the human race. From the seventeenth century each of these nations has taken an active and prominent part in the progress of science.

To speak first of physical and mathematical sciences: though the initiative was due principally to a few men of other countries,—Galileo, an Italian, and Copernicus, a Pole, being the founders of modern astronomy and mechanics,—yet the development of these sciences was concentred chiefly in France, Germany and England. In France, Descartes discovered the methods of geometric analysis, which have proved more durable than his philosophical and cosmogonical theories. In Germany, Kepler invented the laws of planetary movement; and Leibnitz, who by education and the clearness of his conceptions, was perhaps more French than German, laid down the rules of the differential calculus under a form in which they still exist amongst us. At the same time, England produced Newton, greater, perhaps, in the science of nature, than either Descartes, Kepler or Leibnitz; for Newton discovered both new methods of calculation and the laws of astronomy, and since his time we have scarcely done more than develope his ideas and doctrines in studying the movement of the stars.

This same concourse of the three great nations of modern times is seen also in the foundation of chemical science, which in the present day plays so important a part, whether it be in the theories relative to atoms and the constitution of matter, to the formation of stars and of the successive layers of the terrestrial globe, to the origin of life itself; or, on the other hand, in the applications of human industry, dealing with metals, colouring matters, remedies, agriculture and manufactures.

Towards the end of the eighteenth, and at the commencement of the nineteenth centuries, chemistry was established upon a durable basis, after having floated during nearly two thousand years amongst mystical, obscure and incoherent notions. It was a Frenchman, Lavoisier, who fixed these indecisive ideas, by the definitive principle of the stability of matter, invariable in the nature and weight of its simple bodies. Perhaps, as has been asserted, Lavoisier did not discover any particular fact; but, according to Aristotle, principles and causes are things which are of more scientific importance, for by them we arrive at other knowledge. Now Lavoisier discovered the fundamental principle of chemistry: the science dates from him.

Is this saying that Lavoisier divined all, perceived all, traced for all time the plan of chemical science? Not at all; no more than that Newton alone founded astronomy. For this the inevitable concourse of the three great nations was required. Whilst Lavoisier published his immortal researches, the English Priestley and Cavendish discovered the principal gases and the nature of water,—inventions that were seized immediately by Lavoisier to support his theory. The Swedish Scheele brought also his precious contingent to the common work. Some years afterwards, an Englishman of genius, Humphry Davy, completed the edifice by the discovery of the alkaline metals, which he obtained by the application to chemical decompositions of the pile recently discovered by a great Italian, Volta.

Germany equally marked its place in the foundation of the new science. It was in the law of numbers that its work was principally characterized: Richter, Wenzel and the great Berzelius (a Swede) established the law of chemical equivalents, that is to say, a law as general and as absolute in chemistry as the law of Newton in astronomy. It is remarkable that the part of the Germans in this discovery has been principally experimental and practical, contrary to the opinion generally received of the German genius. On the contrary, the atomic theory, properly so called, of a character more abstract and more litigious, is due to an Englishman—Dalton; whilst its demonstration by the physical study of the gases, has been accomplished by a Frenchman, Gay-Lussac. This shows that the geniuses of the European races are not so different as has been asserted. Give them a common and equally high culture, and from each will proceed inventions equally original.

This conjunction of Germany, France and England is to be seen in every great epoch in the history of modern science. The demonstration could be carried down to the present time, proving that neither of these three nations has degenerated from its past: the doctrine of substitutions, the theory of the ethers, that of the polyatomic alcohols, dissociation, the idea of organic ferments, the methods of synthesis of organic principles, have been principally established by French discoveries; the theory of the radicals and that of the polyatomic elements are rather to be attributed to German discoveries; whilst the electro-chemical theory and the method of double decompositions have been invented in England. Finally, the great doctrine of the equivalence of the natural forces, more particularly designated under the name of the mechanical theory of heat, was first discerned by a German, Mayer, and an Englishman, Joule. Developed afterwards by a German mathematician, it has been established in chemistry principally by the experiments of French, English and Danish scientific men. But it would not be wise to dilate upon the science of the present day; we are too near to it, and are too much engaged in it for any estimate to escape suspicion of partiality.

In looking back over this short sketch of the progress of the science with which I am best acquainted, I would not ignore the part of Italy, which in the past was so great (may it resume its importance in the future!), nor that of the United States nor of Russia. But, I repeat, the initiative of the ideas and discoveries has rested for more than two centuries in the bosom of three nations —English, French and German. Their union and their reciprocal sympathy is indispensable, under the penalty of a general loss to civilization.

The Pharmaceutical Journal.

SATURDAY, JUNE 15, 1872.

Communications for this Journal, and books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*
Instructions from Members and Associates respecting the transmission of the Journal should be sent to ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*
Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE LAWS RELATING TO CHEMISTS AND DRUGGISTS.

THAT coroners and magistrates should prove ignorant of the details of the Pharmacy Act; that verdicts should be returned and censures passed upon persons who had strictly performed their duty; and that there should even be, through such ignorance, a possibility of the imposition of penalties having no justification in any Act of Parliament, was perhaps enough to raise the fears of the pharmaceutical body. But it is a matter for regret that great ignorance upon the same subject is to be found much nearer home; and it is most probable that amongst many members of the trade who have indignantly denounced the shortcomings of the authorities outside, there have been men who themselves, day after day, live on, lacking definite ideas on points of law of the greatest importance to all chemists and druggists.

Mr. GREENISH, in the paper on "Pharmacy in Austria" which he read at the May Evening Meeting of the Pharmaceutical Society, called attention to the fact that, in North Germany and Austria, a knowledge of the political laws which govern the practice of pharmacy is required of the student. He also remarked that, in this country, when questions arise affecting the interests of pharmacy, it is not until danger is at the door that pharmacists can be made to understand them. This is no less true of them in their individual than in their corporate capacity.

We are induced to call attention to this subject by the frequent occurrence of cases where chemists and druggists, either in themselves or their families, have suffered from the too late discovery of the real state of the law. There is no need to go far for illustrations. In this week's journal there is a letter from Mr. SMITH referring to the case mentioned by him at the Annual Meeting. We do not understand that he charges any harshness in the carrying out of the law, but that the law as it stands is harsh. If, however, the section providing certain exceptions had expressly included widows, there would still have been an appearance of harshness in debarring mothers and sisters. The hardship in the case in question undoubtedly arose from the deceased gentleman's want of acquaintance with the provisions of the Pharmacy Act.

But it is evident that there is no necessity for such cases in the future; and the requisite steps to avoid them appear to be much easier than an agitation for any alteration of the section. The question at issue is not affected by the fact that men do not like to arrange their affairs; though in this respect the experience imparted to DAVID COPPERFIELD after Mr. SPENLOW's death is scarcely an exaggerated picture.

But, there is another phase of the subject. Every now and then, men who would not wilfully do anything against the law, are surprised to find that they have acted illegally, and the information is sometimes made more impresive by the imposition of a penalty. Thus, only recently in a well-known town in the East of England, no less than eight or nine chemists and druggists, including the local secretary of the Pharmaceutical Society, were fined for selling methylated spirit without a licence. Moreover, the numerous questions that are continually addressed to us respecting licences, stamps, etc., show that there are many who have not yet made themselves acquainted with the contents of the Society's Calendar.

AMONGST the Communists recently executed at Satory was a man who had been convicted of participation in the murder of a pharmacien. The correspondent of the *Medical Times and Gazette* gives the following particulars concerning the crime:—

"The anniversary of the entry of the Versailles troops into Paris painfully reminded me of the dreadful scenes I had witnessed, and the unheard-of atrocities committed during the furious struggle between the insurgents and the regular army. Among the melancholy events that then took place I may mention that related of a pharmacien in the Rue de Richelieu, by the name of Koch, who was brutally murdered by the Communist soldiers simply because he refused to help them in raising a barricade in his neighbourhood. Not only did he refuse his aid, but he attempted to lecture them on their conduct, whereupon two of the men attacked him in his own shop. The pharmacien, however, true to his drugs, kept them at bay with a bottle of sulphuric acid in his hand, which he threatened to bespatter them with if they dared to touch him. The men, finding a dangerous weapon before them, beat their retreat, but soon returned with a reinforcement. The poor pharmacien, considering it would be useless to resist, was carried out of his shop, and, after a sham 'drumhead' court-martial, was ruthlessly shot in the presence of his wife and children, who implored the ruffians for mercy."

IN announcing the occurrence of a fire by which recently the shop of Mr. CHARLES YOUNG, chemist and druggist, Dundee, was partially destroyed, the local newspaper, following in the wake of its London contemporary, the *Times*, has sought to disseminate information concerning the origin of fires. In this case we are told that the fire is supposed to have been caused by the bursting and igniting of a bottle containing *vitriol or some other inflammatory substance.*

ST. JOHN'S WOOD and its neighbourhood is now added to the districts in which the pharmacists have decided to try the effect of shortening the hours of business, the public having been apprised that after July 1st, 1872, it is their intention to close their establishments at eight o'clock every evening (excepting Saturday), and entirely on Sunday and all Bank holidays.

Transactions of the Pharmaceutical Society.

PRELIMINARY EXAMINATION.

The undermentioned was received by the Board of Examiners on the 22nd ult., in lieu of the Preliminary examination.

Certificate of the College of Preceptors.

Baker, John Hopper.............Bristol.

LOCAL SECRETARIES, 1872-73.

Aberdare	Evans, Thomas Whitty.
Aberdeen	Davidson, Charles.
Abingdon	Smith, William.
Altrincham	Holt, William Henry.
Andover	Madgwick, William B.
Ashbourne	Bradley, Edwin Sylvester.
Ashby de la Zouch	Johnson, Samuel E.
Ashton-under-Lyne	Bostock, William.
Aylesbury	Turner, John.
Banbury	Beesley, Thomas.
Banff	Ellis, Bartlet.
Bangor	Griffiths, John E.
Barmouth	Scott, David Wolsey.
Barnet	Huggins, George Thomas.
Barnsley	Badger, Alfred.
Barnstaple	Goss, Samuel.
Basingstoke	Sapp, Arkas.
Bath	Pooley, John Carpenter.
Bedford	Cuthbert, John M.
Belfast	Reade, Oswald Alan.
Belper	Ashton, John.
Berwick	Carr, William Graham.
Beverley	Hobson, Charles.
Bewdley	Newman, Robert.
Bideford	Hogg, Thomas.
Birkenhead	Nicholson, Henry.
Birmingham	Southall, William.
Bishop Auckland	Robinson, James.
Blackburn	Pickup, Thomas Hartley.
Blackpool	Harrison, Joseph.
Bodmin	Williams, Joel Drew.
Bolton	Dutton, George.
Boston	Marshall, Robert.
Bradford (Yorkshire)	Rogerson, Michael.
Bridgnorth	Deighton, Thomas Milner.
Bridlington	Forge, Christopher.
Bridport	Tucker, Charles.
Brighton	Gwatkin, James Thomas.
Bristol	Stoddart, William, W.
Bromley (Kent)	Baxter, William W.
Burnley	Thomas, Richard.
Bury St. Edmunds	Portway, John.
Buxton	Barnett, Alexander.
Cambridge	Deck, Arthur.
Canterbury	Bing, Edwin.
Cardiff	Joy, Francis W.
Cardigan	Davies, David.
Carlisle	Moss, William.
Carmarthen	Davies, Richard M.
Carnarvon	Lloyd, William.
Chatham	French, Gabriel.
Chelmsford	Baker, Charles Patrick.
Cheltenham	Smith, Nathaniel.
Chester	Hodges, William.
Chesterfield	Greaves, Abraham.
Chichester	Long, William Elliott.
Chippenham	Westlake, Bernard.
Christchurch	Green, John.
Cirencester	Skinner, Thomas.
Cockermouth	Bowerbank, Joseph.
Colchester	Manthorp, Samuel.
Congleton	Goode, Charles.
Coventry	Wyley, John.
Croydon	Crafton, Ralph Caldwell.
Darlington	Abbott, John Thomas.
Denbigh	Edwards, William.
Derby	Frost, George.
Devizes	Clark, Robert.
Devonport	Dickerson, Henry.
Dewsbury	Gloyne, Thomas H.
Diss	Gostling, Thomas Preston.
Doncaster	Dunhill, William W.
Dorchester	Evans, Alfred John.
Dorking	Clark, William W.
Dover	Bottle, Alexander.
Droitwich	Taylor, Edmund.
Dudley	Hollier, Elliott.
Dumfries	Allan, William.
Dundee	Hardie, James.
Dunfermline	Stiell, Gavin.
Durham	Sarsfield, William.
Ealing	Barry, Thomas.
Eastbourne	Provost, James A.
Edinburgh	Mackay, John.
Elgin	Robertson, William.
Evesham	Dingley, Richard Loxley.
Exeter	Palk, John.
Eye	Bishop, Robert.
Falkirk	Murdoch, David.
Fareham	Franklin, Alfred.
Farnham	Clarke, Benjamin J.
Faversham	Underdown, Frederick William.
Flint	Jones, Michael.
Folkestone	Cadman, Daniel Charles.
Forfar	Ranken, James A.
Frome	Harvey, William Brett.
Gainsborough	Marshall, John F.
Gateshead	Elliott, Robert.
Glasgow	Kinninmont, Alexander.
Goole	Hasselby, Thomas J.
Gosport	Hunter, John.
Grantham	Gamble, Richard.
Gravesend	Beaumont, William H.
Greenock	Alexander, James G. F.
Greenwich	Tugwell, William Henry.
Grimsby, Great	Palmer, Enoch.
Guernsey	Arnold, Adolphus.
Guildford	Martin, Edward W.
Haddington	Watt, James.
Halifax	Dyer, William.
Hanley	Jones, Charles.
Harrogate	Coupland, Joseph.
Hartlepool, West	Jackson, William G.
Harwich	Bevan, Charles F.
Hastings	Rossiter, Frederick.
Haverfordwest	Williams, William.
Hereford	Jennings, Reginald.
Hertford	Lines, George.
Hitchin	Ransom, William.
Horncastle	Elsey, John.
Horsham	Williams, Philip.
Huddersfield	Higgins, Tom Sellers.
Hull	Bell, Charles Bains.
Huntingdon	Ekins, William.
Hyde	Brocklehurst, James.
Ipswich	Anness, Samuel Richard.
Ironbridge	Hartshorn, William H. T.
Jersey	Ereaut, John, jun.
Kendal	Severs, Joseph.
Kidderminster	Bond, Charles.
Kilmarnock	Rankin, William.
King's Lynn	Atmore, George.
Kingston-on-Thames	Gould, Frederick.
Knaresborough	Sindall, John William.
Knutsford	Silvester, Joseph.
Lancaster	Whimpray, John.
Landport	Stanswood, John.

Launceston	Eyre, Jonathan Symes.
Leamington	Jones, Samuel Urwick.
Leeds	Reynolds, Richard.
Leek	Blades, Christopher.
Leicester	Cooper, Thomas.
Leighton Buzzard	Readman, William.
Leith	Finlayson, Thomas.
Leominster	Davis, David Frederick.
Lewes	Martin, Thomas.
Lewisham	Clift, Edward.
Lincoln	Maltby, Joseph.
Liskeard	Eliott, Samuel.
Littleborough	Dickinson, John E. B.
Liverpool	Abraham, John.
Llandovery	Morgan, Thomas L.
Loughborough	Paget, John.
Louth	Hurst, John B.
Ludlow	Cocking, George.
Lyme Regis	Thornton, Edward.
Lymington	Allen, Adam U.
Macclesfield	Bates, William Isaac.
Maidenhead	Walker, Robert.
Maldon	Wallworth, David.
Manchester, etc.	Wilkinson, William.
Margate	Knight, Alfred.
Market Harborough	Bragg, William B.
Merthyr Tydvil	Smyth, Walter.
Middlesborough	Hudson, John William.
Monmouth	White, Walter.
Montrose	Burrell, George.
Neath	Hibbert, Walter.
Newark	Harvey, John.
Newbury	Childs, Philip.
Newcastle-under-Lyne	Cartwright, William.
Newcastle-on-Tyne	Swan, Joseph Wilson.
Newport (I. of Wight)	Orchard, Herbert Joseph.
Newport (Mon.)	Pearman, Henry.
Newtown	Owen, Edward.
Northallerton	Warrior, William.
Northampton	Barry, James.
Norwich	Sutton, Francis.
Norwood	Baldock, John Henry.
Nottingham	Atherton, John Henry.
Odiham	Hornsby, John H.
Oldbury	Allsop, John.
Oldham	Hargraves, Henry Lister.
Oswestry	Smale, Richard Bill.
Over Darwen	Hargreaves, William Henry.
Oxford	Prior, George T.
Paisley	Hatrick, William.
Pembroke	John, David William.
Pembroke Dock	Andrews, Charles.
Penge	Bennett, Thomas.
Penrith	Kirkbride, William.
Penzance	Cornish, Henry Robert.
Perth	Neil, Reid.
Peterborough	Sturton, Richard.
Petersfield	Edgeler, William B.
Plymouth	Balkwill, Alfred P.
Poole	Penney, William.
Portsmouth, etc.	Rastrick, J. L. (*Southsea*).
Preston	Houghton, William.
Ramsgate	Morton, Henry.
Reading	Hayward, William G.
Redditch	Mousley, William.
Retford	Baker, William.
Rhyl	Jones, Ellis Powell.
Richmond (Surrey)	Hopwood, Henry J. S.
Richmond (Yorks.)	Thompson, Thomas.
Ripon	Judson, Thomas.
Rochdale	Taylor, Edward.
Rochester	Harris, Henry William.
Rothesay	Duncan, William.
Runcorn	Whittaker, William.
Rugby	Garratt, John C.
Ruthin	Bancroft, John James.
Ryde (Isle of Wight)	Wavell, John.
Rye	Plomley, James F.
St. Albans	Davenport, Edward.
St. Andrews	Govan, Alexander.
St. Austell	Hern, William Henry.
St. Ives (Cornwall)	Young, Tonkin.
Salisbury	Atkins, Samuel Ralph.
Scarborough	Whitfield, John.
Selby	Colton, Thomas.
Shaftesbury	Powell, John.
Sheerness	Rayner, William.
Sheffield	Wilson, Edward.
Shields, South	Mays, Robert J. J.
Shrewsbury	Cross, William Gowen.
Sleaford	Heald, Benjamin.
Southampton	Dawson, Oliver R.
Southport	Walker, William Henry.
Spalding	Rhodes, Frank.
Stafford	Averill, John.
Stalybridge	Brierley, Richard.
Stamford	Patterson, George.
Stirling	Duncanson, William.
Stockport	Lowndes, Hervey.
Stockton-on-Tees	Brayshay, William B.
Stoke-on-Trent	Adams, Jonathan Henry.
Stourbridge	Bland, John Handel.
Stowmarket	Sutton, Charles William.
Stratford-on-Avon	Kendall, Frederick.
Stroud	Blake, William F.
Sunderland	Nicholson, John J.
Swansea	Brend, Thomas.
Sydenham	Holloway, Thomas H.
Tamworth	Allkins, Thomas Boulton.
Taunton	Prince, Henry.
Tavistock	Gill, William.
Tenby	Davies, Moses Prosser.
Tenterden	Willsher, Stephen H.
Tewkesbury	Allis, Francis.
Tiverton	Havill, Paul.
Torquay	Smith, Edward.
Truro	Serpell, Samuel.
Tunbridge	Wibmer, Lewis M.
Tunbridge Wells	Gardener, Charles.
Twickenham	Bishop, Thomas.
Ulverstone	Radnall, William Henry.
Wakefield	Taylor, John.
Wallingford	Payne, Sidney.
Walsall	Highway, Henry.
Wandsworth	Nind, George.
Wareham	Randall, Thomas.
Warrington	Webster, Samuel Mather.
Warwick	Pratt, Henry.
Watford	Chater, Jonathan.
Wednesbury	Gittoes, Samuel James.
Welchpool	Williams, T. Kemble.
Wellington	Windeatt, George John.
West Bromwich	Pershouse, Edward.
Weston-super-Mare	Griffith, Charles.
Weymouth	Groves, Thos. Bennett.
Whitby	Stevenson, John.
Whitehaven	Kitchin, Archibald.
Wigan	Dunsford, Samuel.
Winchester	Powell, Edward.
Windsor	Russell, Charles J. L.
Wolverhampton	Brevitt, William Yates.
Woodstock	Stubbs, Robert.
Woolwich	Rastrick, John Alfred.
Worcester	Witherington, Thomas.
Worthing	Cortis, Charles.
Wrexham	Peters, Henry.
Wycombe	Furmston, Samuel C.
Yarmouth, Great	Bell, William.
York	Davison, Ralph.

Provincial Transactions.

NORWICH CHEMISTS' ASSISTANTS' ASSOCIATION.

A lecture on "Botany" was delivered by Mr. O. Corder at the rooms of the above association on May 29th; the President, Mr. A. Hill, in the chair.

The Lecturer said that it would be his endeavour that evening to try and help some of those who, seeking to attain the information which would enable them to rightly name botanical specimens, had discovered what a maze and mystery the many thousands of plants were to them, and the apparent hopelessness of their task. If, however, they did not attempt too much at the outset, but little by little, the task would be found no longer troublesome, but a true and lasting pleasure; and they would see in the different subjects that came before them in nature the marvellous adaptation of every part, —how the one was totally useless and helpless without the other. So students must help each other if ever they wished to attain any benefit by their pursuits. Much might be done by each one bringing plants for mutual examination, so that they might become to a great extent acquainted with the names of the flora of the district. But he might be met with the old cry, "All this is very well, but it would not be required for the 'Minor.'" He, however, wished them to get rid of all such thoughts, and to pursue the study of botany for the love and beauty of it. They would soon find to their pleasure that they had speedily and readily attained that which would help to carry them through both the Minor and Major with honour. He would further impress upon them that such knowledge, once attained by practical means, could never be altogether lost; and, however much it might appear beyond their requirements now, it would be very handy to be able to "inquire within" when information was desired. Sir William Hooker had well said that "the labour of compiling a flora of a country by a careful examination and comparison of specimens themselves, whether in a living or dried state, could only be appreciated by those who had been engaged in an employment of the same kind."

The collecting of materials in their native hills and valleys, upon the seashore, in the woods and among the majestic scenery with which the northern parts of this island eminently abound, generally in the society of friends of a congenial taste or students full of ardour and enthusiasm, was a very delightful occupation, especially when taken in conjunction with the anticipations of the pleasure that they might be able to bestow on kindred minds by sharing with them their discoveries and acquisitions. The more easy the commencement of a study was made, the more votaries would be drawn to it; and though they should attain no further knowledge than what had been already taught in the imperishable writings of a Linnæus or a Smith, yet they might be assured that in plants taken individually and in an isolated manner they would find subjects which would give ample scope for the employment of the talents of the greatest philosophers, in the due contemplation of which they might derive both pleasure and advantage to themselves, and be the means of communicating them to others.

The Lecturer then proceeded to point out the characters which required to be noticed, in order to lead to the recognition of the different plants, illustrating his remarks by reference to a numerous collection of specimens of plants and flowers, the more noticeable amongst which were *Podophyllum peltatum* and *Datura suaveolens* in full bloom.

After a vote of thanks to Mr. Corder, moved by the Chairman, and seconded by Mr. P. H. Mason, the meeting terminated.

TYNESIDE CHEMISTS' ASSISTANTS' ASSOCIATION.

The above Association met at their rooms, Royal Arcade, Newcastle, on Thursday evening, the 6th instant., when Mr. George Foggon, read a very interesting and instructive paper on Castor Oil, illustrated by various diagrams and specimens both of the plant and dried fruit.

At the close of the lecture a considerable amount of discussion ensued, the chief speakers being Messrs. Shaw, Kerse, and Melhuish; after which a hearty vote of thanks was proposed by Mr. J. H. Proctor, seconded by Mr. H. Melhuish, and carried unanimously.

In the absence of the president, Mr. Shaw occupied the chair. There was a very good attendance of members present.

Proceedings of Scientific Societies.

CHEMICAL SOCIETY.

Thursday, June 6. In the absence of the President the chair was taken by Dr. Gilbert, F.R.S., Vice-President. When the usual business of the Society had been transacted, sixteen communications were read to the Fellows present, the titles being "On a remarkable Salt deposited from the Mother Liquor obtained in the manufacture of Soda," by Professor E. T. Thorpe; "On the Composition of Ceylon Jargons," by M. H. Cochran; "On a Double Sulphide of Gold and Silver," by M. M. Pattison Muir; "On the Solvent Action of various Saline Solutions upon Lead," by the same author; "On the Magnetic Sand of Mount Etna," by J. B. Hannay; "New Tests for some Organic Fluids," by J. A. Wanklyn; "Dendritic Spots on Paper," by A. Liversidge; "On Chinoline and Leucoline," by C. Greville Williams, F.R.S. A letter from Mr. Dewar, of Edinburgh, was then read by the Secretary, on some derivatives of Chinoline. Dr. C. R. A. Wright read a paper on the "Action of Phosphoric Acid on Morphine," and Mr. W. H. Perkin, F.R.S., a note on the "Secondary Colouring Matter produced in the preparation of Alizarine from Anthracene;" "On the effects of Temperature on the absorption of Gases by Charcoal," by J. Hunter, M.A. Dr. Armstrong then brought forward a series of "Communications from the Laboratory of the London Institution—No. V., On the Nitration products of the Dibromo-phenolsulphonic Acids; No. VI.: On Bromo-phenolsulphonic Acid; No. VII.: On the formation of substituted Nitro-phenolsulphonic Acids;" and finally the Secretary read a letter which had been received from M. E. Maumené, of Paris.

The meeting then adjourned until Thursday, 20th June, when Mr. H. Deacon will deliver a lecture "On Deacon's method of obtaining Chlorine as illustrating some principles of Chemical Dynamics."

SOCIETY OF ARTS.

April 24, 1872.

Nuts, their Produce and Uses.

BY P. L. SIMMONDS.

(*Continued from page* 980.)

The nuts of the sapotaceous plants yield a large amount of oil, especially the *Bassias* and the *Argan* of Morocco (*Argania sideroxylon.*)

The shea butter or solid oil from the Niger, is obtained from the fruits of *Bassia Parkii*, by boiling them in water. The yield of oil is about 30 per cent. The fruit of another species (*B. longifolia*), yield by expression in India the Elloopie or Mee oil, which is used for lamps among the poorer classes, and is one of the principal ingredients in making country soap. It is of a clear yellow, depositing stearine, density 0·912. The seeds of *B. latifolia* yield by expression a large quantity of concrete oil, called madooka, which is used in lamps, and for other purposes. The kernels are easily extracted from the smooth chestnut-coloured pericarps, when they are bruised, rubbed, and subjected to a moderate pressure. The oil concretes immediately it is expressed, and retains its consistency at a temperature of 95°. It is used locally for the manufacture of soap. It is usually of a greenish-white colour, and has been imported into this country under the name of mohwa oil, from Calcutta.

From *B. butyracea* a pure vegetable oil is produced, called choorie and galam butter. The kernels of the fruit are bruised, put into a cloth bag with a moderate weight laid upon it, and left to stand till the oil is expressed, which becomes of the consistence of lard, and of a delicate white colour. It is considered a valuable preservative when applied to the hair, mixed with some sweet scented oil. It makes excellent soap, and when pure burns bright, without smoke or smell.

There are one or two species of *Bassia* found at Gaboon, yielding 56 per cent. of oil. One, *B. gabonensis*, contains a true vegetable fat, of which two varieties are made, one called "noungu" by the natives, which has the consistency of goose fat; the other, named "djave," is only available for the preparation of soap.

The Borneo concrete vegetable tallow of commerce, judging from the cotyledons of seeds received, would seem to be from one of the *Bassias*. The fat is made up into large, round, flattened cakes, of the consistence and colour of cheese, and also cylindrical masses, which have assumed the form of the bamboo sections into which it had been poured when in a liquid state.

The nuts of *Coula edulis*, in Western Africa, yield 53 per cent. of an edible oil. The Booma nut of Central Africa much resembles an almond, both in shape and size, and with the fleshy covering is about the size of a walnut. It is probably the fruit of a species of *Vitex*. It furnishes an abundance of sweet bland oil, much used by the natives in their cooking.

In Jamaica a fine limpid oil is obtained from the bread-nut (*Omphalea triandia*, the *O. nucifera* of Swartz), but whether it will bear a low degree of temperature without congelation has yet to be ascertained. From another species an excellent oil is produced in Guiana, called ouabe, which is suitable for lubricating machinery.

Ground-nut oil is an important trade article, and the seeds enter largely into commerce.

The plant which produces the ground-nut (*Arachis hypogea*) is a little annual, one of a class which bury their pods in the earth when they ripen, instead of raising them into the free air. Having buried itself sufficiently deep, the pod then begins to swell, and when ripe becomes an oblong, rugged, pale-brown fruit, containing usually about two seeds, as large as the kernel of a hazel nut. It is now found in a state of cultivation all over the hottest part of the tropics. It was unknown until the discovery of America, and every region in the old world where it is now grown owes it to Brazil; so that we have in this plant a further example of the rapidity with which vegetables will take possession of soils where the climate is suitable, for it is now grown very generally in different parts of Africa, in India, the West India Islands, and the United States. The ground-nut, the staple product of the Gambia, is principally cultivated down the borders of the river.

In 1837 the export was but 671 tons, valued at £8000, but it has gone on annually increasing, for in 1860 it was 11,200 tons. The natives have, unfortunately, introduced of late years the pernicious system of beating or thrashing, instead of picking by hand, so that the nuts are mixed with leaves, stones, and other extraneous substances, causing large deductions in the French market, and also depreciating their value in the United States as an article of food, or rather as a favourite repast for the tables of the rich.

In Brazil it is known under the name of "amendoum," and has long been used there parched for food, and to extract oil from. This oil is used for cooking, medicinally for rheumatic affections, and for lighting.

The roasted seeds are sometimes used as a substitute for chocolate; and, according to Dr. Davy, they abound with starch as well as oil, a large proportion of albuminous matter, and in no other instance had he found so great a quantity of starch mixed with oil.

Dr. Muter, in an article in a popular periodical this month, after giving the following analysis of ground-nut meal, urges strenuously its more general use as an important article of food:—

Moisture	9·6
Fatty matter	11·8
Nitrogenous compounds (flesh-formers)	31·9
Sugar, starch, etc.	37·8
Fibre	4·3
Ash	4·6
	100·0

From this analysis it is evident (observes Dr. Muter) that the residue from them, after the expression of the oil, far exceeds that of peas, and is even richer than lentils in flesh-forming constituents, while it contains more fat and more phosphoric acid than either of them. On these grounds we are justified in urging the adoption of the ground-nut meal as a source of food, it being superior in richness of all important constituents to any other vegetable products of a similar nature. Although in the raw state it possesses a somewhat harsh odour, similar to that of lentils, this flavour entirely passes off in the cooking, and when properly prepared we consider that it has a very agreeable flavour. It has been tried in three forms:—First, boiled plain with water, like oatmeal porridge, and eaten with milk; second, made into a custard, with sugar, milk, and one egg to the pint; and third, washed, ground, and taken as a beverage, like cocoa. In all these three forms, but especially in the two latter, it was exceedingly palatable.

This seed is held in much estimation in the United States, where it is known as the pea-nut.

There are fully 550,000 bushels sold annually in the city of New York alone. Previous to 1860 the product of the United States did not amount to more than 150,000 bushels, and of this total nearly five-sixths were from North Carolina. Now North Carolina produces 125,000 bushels; Virginia, 300,000; Tennessee, 50,000; Georgia and South Carolina, each 25,000 bushels; while from Africa come about 100,000 bushels a year. In one week of the month of January, 1871, there were received at the port of New York 2751 bushels.

Another underground seed, passing under the names of rush-nuts, ground pistachio-nuts, chufas, souchet, etc., is *Cyperus esculentus*, the *amande de terre* of the French. They are eaten like nuts, being nutritive, restorative, and stimulant, and are also employed in the preparation of orgeat, a refreshing drink. The toasted roots have been used as a substitute for coffee, and yield a preparation resembling chocolate. In this country we have an earth or pig nut (*Bunium denudatum*, Dec.), which, being aromatic, sweet, and mucilaginous, might form occasionally an addition to our winter desserts, eaten raw, boiled, or roasted.

Under the name of candle-nuts, some considerable quantities of the seeds of species of *Aleurites*, an euphorbiaceous tree, now come into commerce. They are known to the French as bancoul-nuts; in the Pacific Islands they are called kukune. The natives of India are fond of the nut, which is said to be palatable, and something like our walnuts. It yields, by pressure, an oil of a density of ·923, which has various uses. It forms a good drying oil for painters, for, after boiling, it dries in about six hours. It is used for soap-making at Tahiti, in the place of cocoanut oil. It burns without that objectionable smell which cocoanut oil has, and gives a good light without injuring the lamp. It is used also as a drastic purgative. At Nukahiva the nuts are skewered together for lighting at night. The first burns for about ten minutes and communicates to the others, so that a row of 24 will last for about four hours. In the Marquesas and other islands, however, this mode of illumination is giving place to whale oil, purchased from the whale ships.

In the history of the 'Mutiny of the *Bounty*' it was stated that the rooms in Pitcairn's Island were lighted up by torches made of doodoe-nuts (*Aleurites triloba*), strung upon the fibres of a palm leaf, forming a good substitute for candles. These nuts are also so strung and used by the San Blas Indians in Central America, and a child is in attendance to knock off each nut as it becomes burnt out.

By an hydraulic pressure of 20 horse-power, 60 per cent. of oil can be obtained from the kernel of these nuts, but the shell has to be removed by heat or steam, being exceedingly hard to crush. One hundred kilogrammes of the nuts yield 33 of the kernels, and 100 kilogrammes of these, with proper pressure, will yield fully 66 per cent. of oil. The marc or oil-cake left is good for feeding cattle, or for manure. There is a species indigenous to the Eastern Archipelago (*A. malaccensis*), the oil of which is said to be used for culinary purposes in Java, which results, probably, from a more careful mode of preparation.

In China another species of *Aleurites* (*A. cordata*), known as the Tungshu-tree, yields such an abundance of oil that it is said to be one of the largest products of the province of Szechuen. In point of quality it is inferior to that of the camellia, but it is very extensively used for lighting purposes. The natives call it Tung-oil.

Beech-nuts, the seed or fruit of *Fagus sylvaticus*, serve to feed swine on now in forests; but before the general cultivation of cereals they were, like acorns, the food of uncivilized men. Dried and ground into meal, they make a wholesome bread; roasted, they form a tolerable substitute for coffee. A clear, yellow, inodorous oil is obtained from them in France; a bushel of beech-mast will produce about a gallon of oil, or the yield may be said to be 12 to 15 per cent of oil. In some parts of the Continent this oil is used instead of butter for culinary purposes. In the reign of George I. a petition was presented, praying letters patent for making butter from beech-nuts. It is a pity some wholesome vegetable fat cannot be brought into commerce in the present day, when butter is so dear and so bad. A beech-oil company was one of the most noted commercial speculations of Queen Anne's reign.

In Brazil the fruit of *Myristica bicuhiba* (Schott) yield a concrete oil, of a brown colour, which is employed in cases of asthma, rheumatism, tumours, etc.

A good quantity of the small oil nutmegs (*Virola sebifera*) have lately been imported. The seeds, bruised and pressed, by heat give 26 per cent. of a substance entirely soluble in potash water, fusible at 34·5, and composed of two parts of oil, one neutral and the other acid, the last forming about three-fourths of the mass. The neutral part, having glycerine for its base, forms a solid soap with soda. This oil is well adapted for candles. It is very abundant in Guiana, and deserves the attention of business men.

Physic-nut is a name for the seed in the capsules of *Curcas purgans* and *C. multifidus*, which furnish an oil used for lighting and in medicine.

It has the same qualities and uses as croton oil, and in large doses is a dangerous poison. The oil is largely used in Indian camps. It is odourless, of a deep yellow, and viscous, but burns well. When cold, it deposits a considerable quantity of stearine; density ·918. It is largely produced in the Cape Verd Islands, from whence nearly 300,000 bushels are annually shipped.

(*To be continued.*)

Parliamentary and Law Proceedings.

HOUSE OF COMMONS.

Friday, June 7th, 1872.

The Juries Bill.

On the application of the Attorney-General, it was ordered that the Select Committee on the Juries Bill have power to send for persons, papers and records; and that the report of the Select Committees on Special and Common Juries in 1867 and 1868, and on the Juries Bill in 1870, be referred to them.

Adulteration of Food, Drugs, etc., Bill.

The Committee on this Bill has been deferred till Wednesday, July 3rd.

The Public Health Bill.

These Bills, the Committees on which were set down for Monday last, did not come on that day, and up to the present time there is no further allusion to them on the notice papers.

Poisoning by Oxalic Acid contained in Black Draughts.

With reference to the case of poisoning by oxalic acid reported under the above head, at p. 1003, of last week's Journal, we have received a reclamation from Mr. A. J. Stedman, of 18, Castle Street, New Peckham. He states that he was the former proprietor of the shop in question, from whom Dr. Trail purchased it. But he expresses his surprise that it should have been represented that the draughts were the last of the stock purchased from him, since the quantity of black draught left by him,—which was not put up in bottles for sale, but was the remnant of a quantity kept for immediate use,—was not sufficient to supply seven months' demand; in fact, was not more than enough for a week. Moreover, as no spirit was used in making it, he considers that it would long since have become unfit for use.

Suicide by Battle's Vermin Killer.

On Sunday night, May 26th, a young woman named Mary Winnall, residing at Clatter Batch, committed suicide by taking a quantity of "Battle's Vermin Killer." It appears that she had been for a walk, and on returning home went to Mr. Hughes's, chemist, and bought a packet of "vermin killer," went home and took a portion of it, and died in a short time after. Two medical gentlemen were called in, but their services were of no avail. At the inquest Mr. G. Birt, M.R.C.S., said he was called to see the deceased, and found her in spasms, as if suffering from strychnine poison. He tried restoratives, but they proved of no avail. He had since analysed the powder produced, and found strychnine, and it contained sufficient to cause death. The death of deceased was caused by strychnine.

G. Darrell, assistant to Mr. Hughes, chemist, said that on Sunday night the deceased came to the shop from half-past nine to ten, and asked for a packet of "Battle's Vermin Killer," and he sold her a sixpenny packet. Deceased was quite collected, and not at all excited. The word "poison" was on the outside packet.

Evidence was also given that deceased had a "queer temper," and that she had said, on parting from her sweetheart, that he would never see her alive again; but no motive could be attributed for her committing suicide.

After a short consultation, the Jury found that "Deceased committed suicide while in a state of temporary insanity."—*Stourbridge Observer*.

Poisoning by a Baryta Compound.

On Friday, June 7th, Mr. Thomas Taylor, coroner, held an inquest at Bradford, touching the death of Wm. Lawrence, a cotton-warp sizer.

Dr. Isaac Mossop said he was called in to see the deceased on Thursday afternoon, and found him suffering from symptoms of irritant poison. The deceased was quite sensible, and said he had taken some chemical in mistake for Epsom salts. He said he had taken it at the works at which he was employed. Witness was not shown any of the chemical.

Some of the compound was here produced, and Dr. Mossop said it had, at a distance, the appearance of Epsom salts, but if the crystals were examined by any one who was acquainted with the appearance of Epsom salts, they would see a material difference. He was not aware of the nature of the poison until the deceased died. He treated the man for irritant poisoning, and he could not have done more if he had known the nature of the poison. The deceased died at six o'clock on Friday morning. Paralysis had set in, and witness had no doubt that death was the result of the paralysis of the voluntary muscles of the body. He had examined samples of the salts produced, and found that twelve grains would be sufficient to kill a dog and two drachms would kill a horse. A man had been known to die in an hour after taking an ounce of such poison. He had told the deceased how to treat himself, and he could not have altered the result if he had stayed in attendance on him until death.

The Coroner here read a circular referring to the poison, which stated that it was a sizing salt, to strengthen the warps, prevent dust, etc. The manufacturer and patentee, the circular stated, was Mr. A. Heald, 52, Dantzic Street, Manchester, and the name of the compound was "Heavy Baryta sizing Salts." The Coroner remarked that nothing was said in the circular from beginning to end that it was at all poisonous.

A Juror observed that if twelve grains would kill a dog, there must be thousands of grains given off the warps for which the salts were used when they were being manufactured.

Dr. Mossop explained that the salts were exceedingly soluble.

The Coroner: If they are soluble, there would be nothing much diffused but steam, and that might be pure water.

Mr. Seth Blakey, cotton warp sizer, said: I knew the deceased. He had been in my employment about fourteen years, as a cotton warp sizer. He took the management of the dyeing of the coloured work. The heavy baryta sizing salts came into my possession about a week ago. I had never used it before, but was going to make an experiment with it. The deceased along with the other foreman would see the circular sent with the salts.

In answer to a Juror, Dr. Mossop replied that he believed the salts would be injurious if taken in the pores of the skin. He believed he had read cases of death being occasioned by absorption.

Mr. Blakey said that the manner in which the salts were used did not necessitate the men touching it at all with their hands. The warps were sized and dried entirely by machinery. He did not know that the salts were poisonous. They were in the room where the deceased worked, and were open for the men to use just as they wanted them. He had learnt that one other man about the place mixed a teaspoonful with a pint of water and tasted it twice. The man did not take more than a a teaspoonful of the mixture, but suffered from severe vomiting. The deceased told him that he had taken a piece of the salts about the size of a bean in a glass of water. The chemical is not generally used in the dyeing business in Bradford, but it has been used in the cotton business at Manchester. The only thing he found fault with about the circular was that it was not mentioned that the chemical was a poisonous matter. Epsom salts were not used at his works, but they were used in some works.

Mrs. Lawrence said her husband left home about half-past six o'clock on Thursday morning. He was brought home about half-past ten o'clock. He said he had taken a little bit of Epsom salts in a glass of water, and some time after he felt an inclination to vomit. He vomited freely at the works, and when he got home and had some milk, he again vomited freely. It was two o'clock in the afternoon before he was seen by the doctor.

A conversation took place amongst the jury, and several of them expressed the opinion that it was reprehensible on the part of the patentee and manufacturer of the salts to send them out without a warning that they were poisonous. The Coroner said that there was certainly no criminality in the matter. The manufacturer did not send the chemical out to be taken in that way, and it appeared that in its proper use it was not necessary that it should be touched so that any injury might be done by absorption.

The Jury then agreed on the following verdict:—"That deceased was poisoned by taking a quantity of sizing salts instead of Epsom salts." The jury thought that a representation should be made to the manufacturer of the salts, to the effect that in their opinion he ought not to have sent it out without a notice that it was dangerous to life; and that they wished to condemn the practice of sending such things out without some precaution to prevent mistakes.

The Coronor said that Mr. Blakey had very properly opened communications with the manufacturer of the salts, and no doubt he would convey to him the opinion of the jury. Mr. Blakey intimated that he would do so.

The proceedings then closed.—*Bradford Observer.*

Review.

Elements of Chemistry, Theoretical and Practical. By William Allen Miller, M.D., D.C.L., LL.D. Revised by Herbert M'Leod, F.C.S. Part I. Chemical Physics. Fifth Edition, with additions. Longmans. 1872.

Miller's 'Chemical Physics' has been so long known and so justly commended as a text-book, that any further eulogy of it would be superfluous. The present edition differs but little from the last, the most important additions made by Professor M'Leod relating to Solar Chemistry, and the development of the theory of Atomicity.

Under the former head we have a very clear and interesting account, well illustrated by woodcuts, of the discoveries made during the last three years with reference to the solar chromosphere and protuberances. The theory of Atomicity is scarcely required in connection with the physical part of chemistry, and it would perhaps have been better to defer it altogether to the second volume, especially the very doubtful explanation of the variation of the atomicity or combining capacity of an element by *pairs* of units, the supposed universality of which has been disproved by the recent investigations of Dr. Roscoe on the chlorides and bromides of tungsten.

In connection with this subject we think it desirable to direct attention to a proposition (found also in the earlier editions) relating to the Law of Multiples and the Atomic Theory. On page 22, after the hypothesis of the atomic constitution of matter has been laid down in the usual terms, it is stated, as one of the consequences of this hypothesis, "that when the same elements unite in several proportions, these proportions must vary according to the terms of a *simple series of multiples*, since each atom of one element must unite with the other element in the ratio of 1, of 2, or of 3 atoms, or in some other ratio almost equally simple, inasmuch as the atom does not admit of subdivision."

Now, with all due deference to great authorities, we must submit that the conclusion here drawn does not follow from the premises. The theory of combination by juxtaposition of atoms does not necessarily imply combination in *simple* multiple proportions. What, indeed, is there in this hypothesis to preclude the possibility of 1000 atoms of one element laying themselves side by side with 1001, 1003, or 1007 atoms of another, or 1,000,000 atoms of one with 1,000,001, 1,000,003, etc., atoms of another, and so on, up to any conceivable degree of complexity? The indivisibility of the atoms has nothing whatever to do with the matter; for though an atom of A cannot actually combine with a fraction $\frac{m}{n}$ of an atom of B, there is nothing to prevent the combination of n atoms of A with m atoms of B, where m and n may have any integral values whatever. In other words, the atomic hypothesis is perfectly consistent with combination in any numerical proportions whatsoever. And, indeed, we need not search far for compounds exhibiting considerable degrees of complexity in their atomic constitution; such, for example, as the higher homologues of marsh-gas, the proximate principles of the animal and vegetable organism, or some of the derivatives of the opium alkaloids lately discovered by Dr. Wright. On the other hand, it is undoubtedly true that in a large number of important cases very simple ratios of combination are known to exist; but this we learn from observation, and not from any theory whatever.

We would not, however, be supposed to argue against the atomic theory; on the contrary, we regard it as indispensable to the systematic teaching of chemistry. All that we wish to point out is that, although this theory may have been originally suggested by the observation of certain simple cases of multiple proportion, and our belief in it may be strengthened by the observation of a large number of such cases, its connection with such simple proportions is by no means so *necessary* as is frequently supposed. Conclusive evidence of its reality is to be looked for rather in the phenomena of isomerism, and still more, perhaps, in physical phenomena, especially in the constitution and mechanical properties of gases, as viewed in connection with the dynamical theory of heat.

We cannot, however, here pursue the subject further; we merely throw out these hints for the further development which the atomic theory will doubtless receive in the second and third volumes of the work.

Before taking leave of this first volume, we think it desirable to direct the editor's attention to a matter of orthography. We observe in several places, in this, as well as in the former editions, the words "condens*i*ble" and decompos*a*ble." Now we should like to ask whether any one would write the corresponding substantives in the forms "condens*i*tion" and "decompos*a*tion."

BOOK RECEIVED.

THE HYGIENE OF AIR AND WATER; being a Popular Account of the Effects of the Impurities of Air and Water, their Detection, and the Modes of Remedying them. By WILLIAM PROCTER, M.D., F.C.S., etc. London: Hardwicke. 1872.

MEETINGS FOR THE ENSUING WEEK.

WEDNESDAY ...*Meteorological Society*, at 7 P.M.—Annual Meeting.
June 19.

THURSDAY......*Royal Society*, at 8.30 P.M.
June 20. *Chemical Society*, at 8 P.M. — "Deacon's Method of obtaining Chlorine as illustrating some principles of Chemical Dynamics." By H. Deacon.
Linnean Society, at 8 P.M.

SATURDAY ......*Royal Botanic Society*, at 3.45 P.M.

Notes and Queries.

*** *In order to facilitate reference, correspondents are requested to mark their answers in each case with the title and number of the query referred to.*

No notice can be taken of anonymous communications. All queries or answers should be accompanied by the name and address of the writer.

[315.]—MOUSTACHE POMADE.—In reply to the query, under the above head, for a pomade or paste that will darken the colour of a light or grey moustache, we are informed by a correspondent that it may be effected by the use of Condy's Fluid.

[316.]—REMOVAL OF STAINS.—In reply to A. R., the stains of pyrogallic acid and nitrate of silver on the hands can be removed by first applying a saturated solution of iodide of potassium, and then washing them in nitric acid diluted with twice its quantity of water. The iodide itself does not remove the stains, but on applying the nitric acid they soon disappear. A more expeditious and effectual way is to rub the stains with a lump of cyanide of potassium wetted with water, and as soon as they begin to disappear apply tincture of iodine to them, which will remove them at once; then wash the hands well to remove the cyanide; but the first I always find answers the purpose very well, and is not nearly so dangerous to use as the cyanide, which if there is an embrasure of the skin must not be used.—PHOTO.

[317].—BROWN HAIR DYE.—Will some skilful compounder kindly advise me the proper quantity of water to use for dissolving the acetate of lead in the "Brown Hair Dye," described in No. 4, PHARMACEUTICAL JOURNAL, July 23rd, 1870, p. 70.—F. B. J.

[318].—BLACK HAIR DYE.—I should be obliged if some subscriber would mention a "receipt" that will change the colour of the hair to a light black without staining the skin.—E. H.

TARAXACUM COFFEE.—We copy the following from a recent number of the 'Madras Mail':—"A gentleman writing to our Hills contemporary, about Taraxacum coffee, states that he has tried the beverage or remedy with the utmost success. He prepared it exactly as the coffee-bean is used; it was dried, boiled, or roasted, and pounded and used with coffee. One tenth part of Taraxacum to nine parts of coffee. This fortunate gentleman was entirely cured of diarrhœa arising from disordered state of the liver, and is as grateful, we should say, as Maria Jolly, who, 'after 50 years of indescribable agony,' was restored to perfect health, as the advertisements still attest, by the use of six boxes of Holloway's pills, and many pots of his ointment. This simple remedy is within every one's reach on the Hills, as the plant grows wild all over the Neilgherries. We should have thought some enterprising firm in Madras would by this time have advertised Taraxacum coffee for sale. We are not aware that the root even can be obtained in Madras, except prepared as an extract, which is about the most sickening thing possible as a beverage, tasting somewhat like extra flat ditch-water. We think a Taraxacum fizz, made palatable by lime-juice or raspberry vinegar, would make an excellent and popular 'Tonic Water.' Let the 'certified' chemists look to it."

LYCOPODIUM.—Lycopodium has been met with in American commerce adulterated with starch. This adulteration may be detected easily by the microscope, especially if the powder be viewed floating on water containing a trace of iodine.

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

The Proceedings of the Council.

Sir,—Permit me to inform the Council that it is not only possible but usual for the deliberations of representative bodies, charged with administrative and executive duties only, to be conducted privately.

Legislative functions, on the contrary, are properly exercised in public, but these are not within the province of the Council. Is it sufficient to quote the example of Boards of Directors, or does the practice of Committees of trades unions appear more to the point?

In reference to the proposed new bye-law, if anything so one-sided and intentionally offensive is brought forward, I shall move as an amendment, "that security against a hasty vote can only be effectually provided by a general poll, at which the votes of absent members can be recorded."

A Member before the Deluge.

June 11th, 1872.

Clause 16 of the Pharmacy Act.

Sir,—You have added a foot-note to my letter in your issue of June 1st, in which you say, "Mr. Smith appears to overlook the fact, that the widow to whom he alludes was carrying on the business of a chemist and druggist on her own account, and that she could not therefore claim the special exemptions provided in the Pharmacy Act of 1868." Permit me to ask in reply how I overlook this fact, when it is really the special grievance of which I complain? Why is the public to be so tenderly cared for, that a widow who succeeds by will to a business which it probably cost her husband a lifetime to work up, should be mercilessly deprived of it by law the moment the law has declared that it is hers by law and hers only? Clause 16 permits a trustee to carry on a business by means of a qualified assistant. Where is the justice of depriving a widow of the same privilege? Is the much-cared-for public likely to get any better protection from a trustee, who perhaps only unwillingly consents to act from respect to the memory of a friend, than from the widow who, with a qualified assistant, has every reason in the world to conduct her business with a due regard to her own safety as well as that of the public?

Since my letter appeared, I have received communications from all parts of the kingdom (to many of which it has been impossible to reply), expressive of alarm and astonishment that the law is as defined by the Act; while personal and pecuniary offers of assistance have been made to me for the purpose of inducing a reconsideration of this insidious clause; and I feel sure, from the general expression of opinion, that the subject will sooner or later enforce attention from its inherent importance; meantime, many may die in ignorance and leave their widows in the position of my poor friend, who, in a letter to me this morning, concludes thus,—"The more I think of it, the more cruel and bitterly unjust the law seems to be which drove me and my little ones from my home at ——," etc. I do not seek to draw attention to this seriously important question in my own interests only, because they are provided for; but surely it cannot be ignored by those who have any one to care for or a business to leave.

Wm. Fred. Smith.

June 10th, 1872.

[*** The hardship of the case referred to by Mr. Smith is undoubted, but the law on the point being perfectly clear, it behoves those who wish to avoid a sacrifice of their property to make such provision as to its disposition on their decease as will enable their representatives to avail themselves of the special exemptions provided by the Statute; this would be a much simpler way of meeting the difficulty than by agitation for an alteration of the law. Having said this much on the subject, we cannot again make reference to the particular case to which Mr. Smith alludes.—Ed. Pharm. Journ.]

The Sale of Poisons.

Sir,—I attended a sale of chemists' stock yesterday, of which I enclose a catalogue. Amongst the stock I saw about ℥j pulv. opii, ʒj morphiæ mur., ʒiv tr. conii, ℥iij ext. conii, ʒiv. tr. canthar., tr. hyoscy., and many other drugs of the same class sold for one or two shillings for the sake of the bottles.

Is it right that dangerous drugs should be thrown amongst the public in this indiscriminate manner? I saw one child playing with a bottle containing pulv. cambogiæ, and spoke to one of the men in the place about allowing drugs to be about in the careless manner they were. The answer was, it was not his fault; he knew nothing about them.

Is there nothing in the Pharmacy Act to stop such things, which are constantly occurring?

G. J. Girdler.

June 6th, 1872.

The Possibility of Effort.

Sir,—I received last week a letter similar to many with which I am favoured, containing questions which are at once difficult and a most unwelcome task to answer. The whole relates to our Examinations, and a desire is expressed that a clear and lucid understanding as to what is required should be given.

This particular topic has been so fully explained in the pages of our Journal, almost to weariness, that it may be dismissed with a simple reference to past numbers—the nature of the chief question will be best understood by the reply, which, as far as my light goes, I am constrained to make. I believe that when a young man has had but a scanty education, as evidenced by style of composition; when he is deprived of the aid and stimulus of local associations; when he has access to no lectures, and is guided by no teacher, and his sole help is derived from books, it is not possible for him to prepare satisfactorily for his examinations. I except genius—that can level Alps; and I am acquainted with the book of Mr. Smiles on triumph over difficulties; still, taking things on an average and the world as it is, we come back to the old narrative, "Understandeth thou what thou readest? How *can* I understand unless some one teach me?" Let me not, however, leave the subject without trying to set something right. Students aided only by books often fall into error by selecting elaborate treatises for their instruction; hence they distract their minds in inextricable mazes, in which they detect no plan, and out of which they see no exit. Pereira's Elements or Miller's Chemistry are excellent adjuncts to the lecture-room, and specially adapted to those more advanced, but works of simpler character should be chosen at the commencement. These voluminous compendiums dismay the tyro, they do him positive harm, and for all useful purposes a quiet dip in the Encyclopædia Britannica would do as well.

When a young man means to learn French, he conveys Molière, Racine, Corneille, Bossuet and other classic writers to the river to which he is most contiguous; then he attempts to fathom the mysteries of 'La Bibliothèque des Familles,' or probably asks Hachette what are the manuals at present used in a French infant school? So children learn; remember, my hopeful correspondent, that when you or I approach a science we are nothing else.

Joseph Ince.

Provincial Pharmaceutical Education.

Sir,—In the Journal for June 1st a letter appeared from Mr. Taplin, which, I think, contains the very best suggestion that has been yet made to meet a difficulty with regard to the above; but I would append to it, that if it is carried out, assistants now passing for their examination, and apprentices already bound, shall be able to avail themselves of the plan proposed.

I have great confidence, now my friend Mr. Schacht is elected on the Council, this very important subject will have their early attention, and that some satisfactory arrangement will be made to meet the wants of the assistants and apprentices throughout the kingdom.

John Martin.

Clevedon, June 4th, 1872.

Sir,—In a previous letter I stated that to aid the country schools would be very unfair; to support this remark, as well as to say a word or two upon another subject, is my object in writing again.

Unfair, first, to the Majors and Minors who have been induced to proceed to London and elsewhere to acquire a good pharmaceutical training, at very great expense to themselves; the aim of the proposed scheme being to make the obtaining of degrees easier and cheaper than it has been to those already passed.

Unfair, also, to members in business, that their subscriptions should be appropriated to a cause which they really do not care to support. Unfair to the registered apprentice who has passed his Preliminary examination, and paid his fees, since the country schools make no distinction between registered and unregistered students, but admit all to the course of instruction for the same fees, the unregistered not having to pay double fees for learning, as in London.

Unfair, lastly, to every one enrolled into the Society, on account of its not being a good general scheme.

Why should the members, associates or apprentices at Tadcaster contribute to a society which supports a school at Manchester, but not one in their own town or village, which has as good a claim for aid from the Pharmaceutical Society as any larger place has?

Were the scheme for Provincial Education a fair, possible, general and practicable one, not a murmur would be heard; but since it has been shown to be the contrary, discontent must be expected from a large number opposed to it. If the Society has more money in hand than it needs, let it return to its members a percentage of the fees already contributed. A few days ago we heard in a whisper what we must expect to hear in a loud tone by-and-by, "Give me back my money."

A good deal is now said about payment on results; but he who proposes to give the pharmaceutical teacher payments on the results of the examinations cannot have received payments on the same system himself, especially during the past few years. Had he done so, he would not recommend a plan which, in its working, is nasty, mean and derogatory, and also a great barrier to the obtaining of good teachers. All teachers in the country are opposed to it, considering it most debasing in principle. Would our professors in Bloomsbury Square, or any other good teacher, like to be paid according to the results of the examinations? Ask any one also if the system of "coaching up" a student which is adopted by a teacher receiving payments on results is to be recommended. I would vastly like to ask Dr. Frankland if he would submit to this system which has been imposed upon others by the system of science teaching, in the management of which he has had a part. Certainly, examination papers have been framed to match the amount of money in hand; and what was seen twelve months since? Science teachers and students all dissatisfied. What do we behold now? The tumbling down of this system; the best teachers gone, having become disgusted with it; and perhaps one-sixth of the number of science teachers and students now that there were last year. Dr. Frankland, however, may not be to blame for this, having perhaps been obliged "to put on the screw" in order to comply with the "regulations" of our present Government.

The question of Provincial Education has many difficulties. Professors Redwood, Attfield, and Bentley may be able to give us some new information. May I propose that they each be invited to read a paper upon it at some evening meeting?

A Country Major Associate.

The Preliminary Examination.

Sir,—The letter in your Journal of May 25th, signed "Another who failed on April 8th," must surely be intended for satire, as it is scarcely credible that any one would seriously own to such dense ignorance. What a libel on the 21 young men at Manchester! No knowledge of the elements of arithmetic at Manchester of all places in the world! The 21 will, doubtless, in your next issue repudiate the base calumny. I had hoped in this age of education to sleep quietly in my grave, but the dreadful confession of your correspondent so troubled me that I could no longer rest. Hoping that I may not be so disturbed again,

The Shade of Cocker.

Sir,—I have read with great interest and pleasure the letter signed "One who has known the drug trade more than thirty years," and with one important exception I quite agree with what he has written. Until pharmacists set themselves determinedly against binding youths before they have passed the Preliminary examination, I consider it vain to expect apprentices to show much improvement. The youth he speaks of, who from his previous training ought to have been, and probably was, able to have gone up direct from school and passed his Preliminary, is, after two years, thought unable to do it; for carelessness and indifference have set in, and such a youth, knowing that he can have a reprieve for four or five years, makes no proper effort to keep up his knowledge. Had he passed before he was bound what energy he possessed would have been available for obtaining a practical knowledge of his business, and by the time his apprenticeship expired, he should have been able to pass his Minor examination.

One who has known the Drug Trade More than Forty Years.

Pharmaceutical Mnemonics.

Sir,—I wonder whether your ingenious correspondent, 'S. F. E.' has come across the following form for conf. sennæ.

"Coriander, tamarinds,
Senna, prunes and sugar refined;
Water, figs and cassia nice,
Made into a mass with liquorice."

Or, as to Sassafras:

"Pray, Mr. Sassafras, where will you go?
Into Decoctum Sarsæ co.?"

If not, I am pleased to introduce them to his notice.

J. Burt.

Worthing, June 1st, 1872.

E. W. Howe.—We are unable to give insertion to your letter.

S. N.—You cannot do better than follow one of the works mentioned in the official announcement respecting the prize.

"*Apprentice.*"—You should apply at Apothecaries' Hall.

G.—No. 2.

J. Wright.—We believe the excise authorities do not construe the Act strictly in reference to such a label as that sent by you. It would, however, be safer to apply at Somerset House.

J. H. D. Jenkinson is thanked for his communication.

"*Veritas.*"—The President desires us to refer *Veritas* to the rule as to anonymous communications.

"*Law.*"—Your question is a legal one; and without knowledge of the special circumstances, we hesitate to express an opinion.

R. J. M.—Medicated pessaries are generally made to weigh two drachms each; and when moulded in proper moulds, they have the shape of a rifle bullet, but broader. They may be prepared with oil of theobroma as a basis, although those containing salts like bromide of potassium, would be better prepared with a material made according to the formula given at p. 446 of the first volume of the present series of this Journal. This question was received too late to be answered in last week's Journal.

J. E. R.—The prescription sent (a formula which Mr. Erasmus Wilson often prescribes) makes a mixture of a clear sap-green colour. It is best prepared by rubbing the citrate, acid, and syrup together until dissolved, then adding the tincture, etc. Tincture of orange, varies very much in colour: if prepared from good dried thin English peel, it will be of a pale sherry colour. This may partly account for the difference you mention.

J. E. Lord.—According to your request we have submitted your letter to Mr. Joseph Ince, and you will find his reply printed on the previous page.

"*Victim.*"—We do not think there would be any difficulty in inserting such an advertisement as that you refer to, if forwarded to the proper quarter.

H. Sagar.—The article referred to has been stated by two or three respectable authorities to be a narcotic, and until this is disproved, we do not see that the conjectures put forth by you affect the question.

Communications, Letters, etc., have been received from Mr. P. Bedford, Mr. Rimmington, Mr. Henty, Mr. Druce.

THE MICROSCOPE IN PHARMACY.

BY HENRY POCKLINGTON.

(*Continued from p.* 1006.)

KRAMERIÆ RADIX.—The toughness of this root causes it to be somewhat difficult to make a perfect section without very prolonged soaking in warm water. Cross sections may be very rapidly prepared for examination or permanent mounting in the following manner:—Having cut the sections as thinly as possible, place them in a watch-glass containing alcohol for a few minutes; remove them to a glass slip with plenty of alcohol, and cause the alcohol to boil for a few seconds, a thin cover having been placed upon the section to prevent its curling; remove the alcohol with blotting-paper, and add ol. anisi. Cause this to boil for a few seconds and remove as before. Add dammar or balsam dissolved in benzole, or dammar dissolved in ol. anisi, and when set, the object is ready for the cabinet. This method secures a great amount of transparency in certain dense tissues, such as can hardly be obtained in any other way, but it is obviously inapplicable to soft or delicate structures, or those in which delicate markings exist.* In the study of hard woods it is desirable that sections thus mounted should be carefully compared with those mounted in fluid or glycerine jelly, as these several media bring out different details into prominence.

In Krameria the medulla is insignificant, the appearance which a cursory inspection with the naked eye would lead us to infer was the medulla well developed being due to the presence of colouring matter in the older wood layers.

Wood Zone.—The structure of the wood zone is very interesting, whether viewed in cross section or studied more carefully in longitudinal section. The medullary rays are not very apparent in cross section, and in fact do not always extend beyond the earlier layers. They are somewhat short, sub-cylindrical cells, frequently very highly coloured, especially near the centre of the stem. They are very numerous, the incomplete vascular wedges of the wood being in consequence extremely narrow in proportion to their length. The highly coloured cells of the medullary ray contain but little if any starch; the uncoloured ones, however, contain a considerable quantity. This is particularly the case with the incomplete medullary rays (those which only extend part of the way across the stem, as from the bark to the middle layer, or from the centre to the middle). Seen in cross section, the wood cells are nearly circular, with considerably thickened walls. Vessels from two to four times the diameter of the wood cells are very numerous, and irregularly distributed among the wood cells. The boundaries of each year's growth are frequently well marked by difference of colour, this being greatly the case with the first and following year. The vessels are much pitted, the pores traversing the secondary deposits being well seen in longitudinal section. The pits are oval, disposed towards circular, and transversal. I have not been able to satisfy myself as to the existence of a spiral deposit in any of these vessels or in the wood cells, but there are traces which lead me to suspect its presence. In length the vessels exceed the wood fibres from two to four times, but are of very similar shape. The wood cells are peculiarly shaped, and resemble the cells of the "leaf" of sphagnum (sufficiently familiar as a show object to most microscopists) when seen in longitudinal section, intermixed with the cells forming the vessels. The wood cells are many times longer than they are broad, and are devoid of contents other than reddish-brown colouring matter. There are no raphides in any part of the root.

Cortical Zone.—The cortical layers comprise the usual layers of the bark, liber cells, and laticiferous vessels, the whole of which may be best studied in longitudinal section, beginning from the outside. The cells of the external layer do not require special note, being wholly of the usual type. Immediately below this is a layer of loosely aggregated, nearly globular parenchymatous cells, containing a richly coloured semi-fluid matter. The remaining layers are loose parenchyma cells, with the usual type of anastomosed laticiferous vessels and liber cells. The cortical layers are moderately rich in starch. The starch granules are round, with a somewhat indistinct hilum, of medium size, and less variable than usual. They give the usual cross with polarized light. No adulterations of powdered rhatany root are known to me. They would be easily detected by one familiar with the structure of the genuine root.

(*To be continued.*)

* Dammar dissolved in equal parts of ol. anisi and benzole sets more rapidly, a matter of importance to many.

STUDY.

BY W. WILLMOTT.

If I were to adopt the primary idea suggested by my title, I should commence at once an investigation into the laws of mind. From thence I should travel into the regions of matter; from thence to mind again, and from mind and mind's complexity to the unknown depths of metaphysical causality. Nor would it in any way add to my position to know, that from these unknown depths, after a presumably laborious research, I should emerge with but little real enlightenment on the subject of my inquiry; so intimate and so marvellous is the connection between mind and matter that it is impossible to determine where the influence of the one ends, and the other begins. I say this with all due deference to those eminent psychologists, Brown and Locke, who have expatiated so profoundly on mental and psychical philosophy. Even in the productions of these great writers there is abundant evidence of the inaptitude of the human mind to lift the veil from the attributes of the Infinite. From their perusal, therefore, we rise with a deepened conviction of man's inability to attain the summit of intellectual ambition. And if such is the case with the highest order of minds, still less, on an occasion like the present, can my remarks be consistently prefaced with any such attempt. I shall, therefore, simply premise that *mind* is the term by which we express the collective faculties of the brain; the brain being the organ through and by which the mind developes its nature and manifests its power. Some have told us that matter itself thinks, and that the continuance of matter in a peculiar form is essential to the perpetuity of consciousness. But were we to lay bare the brain with the hope of discovering these particles of thought, our labour would undoubtedly result in complete failure. Mind *per se* is immaterial, and therefore beyond the reach of anatomical research.

But I pass on to the consideration of my subject in a manner at once trite and practical. Lord Brougham says,—"He, who, in whatever station his lot may be cast, prefers the refined and elevating pleasures of knowledge to the low gratification of the senses, richly deserves the name of a philosopher." We might object here to the term "philosopher," because it is one which admits of very wide signification. The meaning, however, is sufficiently apparent as distinguishing those who are seekers after knowledge from those who prefer in its place the low gratification of the senses. A true philosopher must not only have knowledge, he must have *wisdom* to guide him in its application. The mere reading of books will never make us philosophers. Books, however, cannot be too highly prized as aids to knowledge and goodness; but withal there are so many of various kinds issuing from the press daily—I may say almost hourly—and so many ways of reading them when they come into our possession, that it is quite possible to wade through a mass of miscellaneous literature without a single accession to previous acquirement either in one direction or the other. That there is a good and a bad method in the matter of reading, there cannot be a doubt. By the adoption of the former we shall obtain great profit, but by the latter no profit at all. Some readers seem to delight in the number of pages they can turn over in a given time, whilst the majority too frequently ignore the very portion of a book which should first claim their attention, namely, the preface. The preface is, or ought to be, the key to the entire volume, and should never be passed over. Nor should the reader begin (as I regret to say I have seen some do) at the end of a book and read backwards—a little here and a little there — denouncing it as "dry" should he happen in his cursory examinations to stumble over a few sterling passages. No! if we wish to profit by our reading, we must read consecutively and by system, with due care and thought, always remembering the injunction of Lord Bacon, "not to believe and take for granted, but to weigh and consider." It should be borne in mind that knowledge is not gained by the quantity we read, but by the quantity we digest and remember. It is with the mind as with the body. The body is not sustained by the quantity of food we take, but by that which we assimilate. Therefore I say it is far better to read one page, or one book, carefully and well, than a hundred in a desultory and unprofitable manner.

But I desire here to distinguish between reading and study. Study is something more than the reflection on the brain of a succession of verbal ideas. It is that condensation of aggregate faculty, that power of abstract thought, that concentration of judgment and purpose, which carries the student, as it were, out of himself, and grapples successfully with the subject he aspires to conquer. This, I think, is study as distinguished from mere reading; and I would commend the inference to the earnest consideration of those who aspire to fame and distinction in the character of authors. There are so many questionable works constantly issuing from the press in conjunction with those of a really elevating character, that it requires considerable discrimination to choose between them. And this would seem to obtain in whatever department of literature we roam, though it must be said that works of fiction are especially open to the charge. A good book is a real friend, whilst a worthless one is a real enemy. Wordsworth has thus sung the praise of books:—

> "Books, we know,
> Are a substantial world both pure and good,
> Round which, with tendrils strong as flesh and blood,
> Our pastime and our happiness will grow."

I have nothing to say against works of fiction, provided they are really good; on the contrary, to those who cannot concentrate their attention on deeper themes they form a pleasing, and occasionally an instructive pastime. But works of fiction must always occupy a subordinate position on the shelves of the student. I do not mean the *sham* student, but he who loves knowledge for its own sake. He, indeed, is constantly reminded that he must not only read, but *study*,—that he must still go on, though the page were never so dry and wearisome. Happily, however, the struggle is progressive; for even while the oil flickers in the lamp, even while he stretches every thought and purpose toward victory, the clouds gradually disperse, the morning breaks upon him, and the glorious rays of an intellectual luminary brighten his onward course!

If I were asked to name the order of importance of the various branches of knowledge, I would decidedly rank science and philosophy before ordinary literature, and ordinary literature before those productions of which the element of imagination forms so large a component.* These, again, would precede that numerous class of works the perusal of which is so apt to inspire us with erroneous impressions both of men and things, and thus to sow in the mind the seeds of disappointment and regret. The languages are good exercise, and form ample ground for systematic reading; but to those who are just commencing life I would recommend as well the study of appropriately-written physiology and moral philosophy.† There are few studies more important than these; and yet, practically, there are few which are more generally neglected. The former teaches us the adoption of principles and practices having special reference to the laws of health, and the latter the regulation of faculty, sentiment, and propensity, and the application of those high moral and psychical influences which govern our whole being and make us what we are. In other words, the one has reference to our physical well-being, and the other

* "The first subject of study," said Viscount Palmerston, speaking of the sciences, in his address as Lord Rector of the University of Glasgow in 1863, "would naturally be that which is commonly comprised in the single term chemistry,—the operations of nature in all those elements in which we live and deal,—a knowledge of which is useful to every man in his individual condition, and on the study of which depends the industry, wealth and prosperity of nations. It is not to be expected that those who are destined for the church or the bar, or other such professions, should become skilful as analytical chemists; but they should be acquainted with the general principles by which substances act on each other, and this knowledge will be found useful in every position in life. Now, they concern the peasant in his cottage, the workman in his convenient dwelling, as much as they concern the great manufacturer in the arrangement of his business, because health and life are essentially connected with the practice, and the experience, and the counsel of the chemist."

† "Philosophy means literally the love of wisdom. It is the love of a hidden treasure; therefore it comes to mean a search after wisdom."—*Moral and Metaphysical Philosophy*, by Professor Maurice.

to our moral and intellectual well-doing. If young men (and, in this age of feminine progress, may I not also say young women?—the former with their generous hearts and lofty aspirations, and the latter with their bright hopes and cheering smiles) would devote only one hour in the day to these two subjects, and apply the facts so acquired to their every-day lives, I do not hesitate to affirm that a vast amount of sorrow and regret would be saved to the world; or would they devote this one hour to some other study of a useful and ennobling character, sure I am that, although they may not acquire the genius or the intellect of a Shakspeare or a Milton, a Butler, a Paley, or a Faraday, their minds would be expanded and improved, to their own good, both in time present and to come.*

One hour in the day is not a large demand; and I trust I shall not be thought severe when I say that in many instances young ladies may spare this small division of time from their conversations on the opera or the last new novel, or from their elaborate and self-imposed duties at the shrine of beauty and adornment; whilst, on the other hand, the same brief period may not unfrequently be subtracted by the younger members of the opposite sex from their fervent disquisitions upon political routine, or from those images of objects which float noiselessly away on the ridges of clouds blown from their favourite Havannah. But then it is so *hard* to study for oneself, and so *easy* to borrow one's neighbour's head; so hard to think, reflect, compare, compound, and abstract, and so easy to criticize, imagine and declaim. Yes; but it is just because this *is* so that study claims our acknowledgment. It tells us that if we will accept it as a friend, it will not betray our confidence; for, in addition to giving us an insight into action and passion, and leading us onward and upward, it will show us many marvellous things. It will show us what the world is in which we live, from those laws which govern the rolling of the mighty deep to those which preside over the smallest occurrences of ordinary life, both alike leading the mind by an unbroken chain from the material to the immaterial, from the finite to the infinite.

(*To be continued.*)

IODIDE AND BROMIDE OF POTASSIUM.

BY CHAS. D. CHASE.

The object of this note, as will be seen, is simply to call the attention of dispensers to the fact that most of the iodide and bromide of potassium found in the United States market, instead of being neutral, are alkaline in their reactions, and to illustrate the importance of this fact being generally known.†

The following prescription was prepared, with results as given below:—

℞. Morph. Sulph.	gr.iv	
Aquæ Cinnam.	℥ij	
Potass. Bromid.	ʒiij	
Syr. Tolut.	℥iss	
Elix. Calisayæ	ʒiv.	M.

The morph. sulph. was weighed and introduced into a four-ounce vial, the potass. bromid. weighed and rubbed in a mortar with the aqua cinnam. until entirely dissolved, and the solution poured over the morph. sulph. contained in the vial. The morph. sulph. refusing to dissolve after shaking, the vial was set aside and the preparation begun anew.

This time the morph. sulph. was dissolved in the elix. calisayæ, the potass. bromid. in the aqua cinnam., and the two solutions mixed.

A precipitate immediately followed, which, upon the addition of the syr. tolut., and after shaking, slowly arose to the surface of the mixture.

The preparation not being entirely satisfactory, a few experiments were made with a view of ascertaining the cause of precipitation. To be assured that the fault was not with the aqua cinnam. (which had been made by distillation from the bark), the prescribed quantity each of morph. sulph. and potass. bromid. was dissolved separately in distilled water, and the two solutions mixed.

The same result was obtained as when aqua cinnam. was used as the solvent.

An examination was next made of the morph. sulph., which proved to be pure sulphate of morphia. The chances for the potass. brom. to prove perfectly faultless now looked rather "slim." A solution of the suspected salt was made in distilled water, and tested with litmus and turmeric paper. The solution gave with both papers a decided alkaline reaction, which fact solved the mystery of the precipitation; for, as is well known, the alkalies and their carbonates precipitate morphia from solutions of its salts; and when the morph. sulph. solution came in contact with the free alkali (potassa) contained in the potass. bromid. solution, the precipitate must inevitably have taken place.

Several samples each of iodide and bromide of potassium were tested with turmeric paper, and in every instance the same alkaline reaction was observed.

The foregoing serves to show how serious accidents might occur by dispensing the salts of morphia (or other alkaloids) with iodide or bromide of potassium which gives an alkaline reaction; for if prescribed with syrup, as in the above prescription, the precipitated morphia will rise to the surface of the mixture, and, should it not be "shaken before taken," the patient will be liable to take all, or nearly all, the morphine in the mixture at a single dose.

It is therefore advisable for the dispenser, whenever a morphia salt is prescribed with iodide or bromide of potassium in solution, to first dissolve the latter, test the solution with turmeric or red litmus paper, and if alkaline neutralize with dilute muriatic acid before adding the morphia salt; and a bottle of the acid mentioned and the necessary test paper

* "The value of odd moments is incredible to those who waste them. An hour in every day withdrawn from frivolous pursuits and profitably employed, would enable a person of ordinary capacity to go far towards mastering a complete science. It would make an ignorant man a well-informed man in ten years. . . . . . Even fifteen minutes a day devoted to self-improvement will be felt at the end of the year."—*The True Road to Success.*

† The presence of alkaline carbonate in iodide and bromide of potassium is an impurity arising probably from the process of manufacture adopted in the United States. The reports on the iodide and bromide of potassium, used in medicine, published some two years since in the 'British Medical Journal,' show that in this country these salts are practically quite pure. See Vol. I. of the present series of the Journal, pp. 89 and 147.

should be placed convenient to the prescription counter, for this if for no other purpose.*

With a small proportion of morphia salt the precipitate is often not observed until after standing a short time.—*American Journal of Pharmacy.*

POPPY CULTURE IN AUSTRALIA.

Some attention has recently been given to the cultivation of the poppy for commercial purposes in various parts of Australia. From a letter which recently appeared in a colonial paper, describing the results of an experiment in poppy culture in the Bendigo district, we gather the following interesting facts. About a drachm of the seed, which was that of the white variety, was sown in the early part of August along each of three drills, 86 feet long and 2 feet apart, and were lightly covered with small firewood, bark and sand. The land was rather heavy, and mixed with a good deal of quartz. It had been well manured and broken up; grape vines had been grown on it for a succession of years. On the 18th day after sowing, the young shoots were visible, looking like fine blades of grass, and they continued to grow pretty well. When between five and six inches high they were weeded out, and several were transplanted, but all the latter died, in consequence, probably, of insufficient watering and the heat of the weather. By the 20th November the others were flourishing "like great cabbages." These began to flower pretty freely by the first week in December, by the time the plants were about 5 feet or 5 feet 8 inches high. The capsules produced varied in size from 1 inch to 2½ inches in diameter. After the petals had fallen off, and while the stamens were still clustering round the neck of the capsules, horizontal incisions half round the heads at their lower part were made. A creamy juice exuded from these cuts, which were made in the afternoon, and it soon became pinkish, and by the following morning brownish-red, and of a tenacious consistence, when it was scraped off with a sharp straight knife, and collected on the edge of a small tin cover, which plan is recommended as being less troublesome and not so wasteful as the usual one of gathering the opium upon the poppy leaf. Each poppy head did not yield more than equal to the bulk of a small pea, and from all the plants raised from the drachm of seed 250 grains of opium were collected; but it must be borne in mind that many plants were entirely lost, and others not matured. The opium collected was considered to be of very good quality.

The conclusions arrived at from this experiment are that the poppy requires a certain amount of careful nursing and a pretty liberal supply of water. The distance between the rows should be three feet, to allow of the full growth of the leaves and room to pass between the plants when collecting the juice. A sheltered aspect should be chosen, so as to protect the plants from strong winds. Finally, the writer says,—"The collection of the product is not, to say the least, very agreeable; and, from the length of time occupied by it, the labour must be very cheap for the crop to pay. Perhaps the plant might be cultivated with profit near industrial schools. In conclusion, I think the opium poppy can be successfully raised in this district if a plentiful supply of water be available when necessary."

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* Commercial iodide of potassium is usually crystallized from alkaline solutions in order to obtain it in opaque cubes; recrystallization or granulation from water will effectually remove any adhering alkaline carbonate.—*Editor Amer. Journ. Pharm.*

Chapters for Students.

CHEMICAL NOTES TO THE PHARMACOPŒIA.

BY WILLIAM A. TILDEN, D.SC. LOND.

DEMONSTRATOR OF PRACTICAL CHEMISTRY TO THE PHARMACEUTICAL SOCIETY.

Zinci Acetas.—$Zn\ (C_2H_3O_2)_2\ 2H_2O$. Carbonate of zinc is dissolved in acetic acid diluted with about an equal quantity of water, and the solution set aside to crystallize,

$$ZnCO_3 . 2Zn\ (HO)_2 + 6\,[HC_2H_3O_2] = 3\,[Zn(C_2H_3O_2)_2] + CO_2 + 5H_2O.$$

The same compound is of course produced when the oxide or metallic zinc is dissolved in acetic acid. In the latter case hydrogen gas is slowly evolved.

The salt is recognized as an acetate by evolving acetic acid when decomposed by sulphuric acid, and as a compound of zinc by giving a white precipitate of sulphide of zinc with sulphuretted hydrogen or with sulphydrate of ammonium.

[§ A dilute watery solution is not affected by chloride of barium or nitrate of silver, and when slightly acidulated with hydrochloric acid is not precipitated by sulphuretted hydrogen; after it has been boiled with a little nitric acid, it yields with ammonia a white precipitate entirely soluble without colour in an excess of the reagent.] The foregoing tests taken in order are intended to indicate the absence of the following impurities:—Sulphate; chloride; copper and lead; iron.

Zinci Carbonas.—$ZnCO_3\ 2Zn(HO)_2 . H_2O$. Boiling solutions of sulphate of zinc and carbonate of sodium are mixed, and the liquid kept hot until effervescence has ceased. The precipitate is then collected and washed to free it from sulphate of sodium.

The carbonate of zinc which is at first precipitated is resolved by the action of water into CO_2, which escapes and a hydrate-carbonate which constitutes the official salt.

$$\begin{aligned} & 3ZnSO_4 + 3Na_2CO_3 + 2H_2O \\ = \; & 3ZnCO_3 + 3Na_2SO_4 + 2H_2O \\ = \; & ZnCO_3 . 2Zn(HO)_2 + 3Na_2SO_4 + 2CO_2. \end{aligned}$$

This decomposition of the precipitated normal carbonate in presence of water always occurs, except in the case of the barium, strontium, and calcium carbonates. [See Magn. et Ferri Carbonates.]

Zinci Chloridum.—$ZnCl_2$. Metallic zinc is dissolved to saturation in diluted hydrochloric acid.

$$Zn + 2HCl = H_2 + ZnCl_2.$$

And then in order to remove lead and iron, if present, from the filtered solution, a small quantity of chlorine water is added, and the whole is agitated with carbonate of zinc. The chlorine converts the metals into perchlorides.

$$\begin{aligned} 2FeCl_2 + Cl_2 &= Fe_2Cl_6 \\ PbCl_2 + Cl_2 &= PbCl_4, \end{aligned}$$

and the carbonate of zinc causes their precipitation as hydrates.

$$Fe_2Cl_6 + 3ZnCO_3 + 3H_2O = Fe_2(HO)_6 + 3ZnCl_2 + 3CO_2$$
and
$$PbCl_4 + 2ZnCO_3 + 2H_2O = Pb(HO)_4 + 2ZnCl_2 + 2CO_2.$$

By digesting the solution on an excess of metallic zinc, as the Pharmacopœia directs, no lead will be taken up.

Evaporated until watery vapour ceases to be evolved the solution leaves the zinc chloride as a colourless syrup, which solidifies on cooling. It may be made to crystallize from a very concentrated solution.

[§ Colourless opaque rods or tablets very deliquescent and caustic, soluble almost entirely in water, alcohol and ether.]

The white flocculent precipitate generally left when chloride of zinc is dissolved in water is oxychloride. For the detection of impurities the same tests may be employed as with the other salts of zinc.

Chloride of zinc enters into direct combination with ammonia, NH_3 and also with alkaline chlorides.

Zinci Oxidum.—ZnO. Carbonate of zinc is heated to redness in a crucible. Carbonic anhydride and water escape, leaving the oxide.

$$ZnCO_3\ 2Zn(HO)_2H_2O = 3ZnO + CO_2 + 3H_2O.$$

Oxide of zinc is deep yellow whilst hot, but becomes nearly white on cooling. It is sometimes made by submitting the metal to distillation in a current of air. The oxide thus obtained is very pure, but liable to contain particles of metal.

Zinci Sulphas.—$ZnSO_4 . 7H_2O$. Zinc is dissolved in diluted sulphuric acid, and when the acid is saturated, the solution is treated with chlorine and carbonate of zinc for the purpose of removing iron. A small quantity of chloride of zinc is thus introduced into the solution, but it is too minute to interfere with the purity of the crystals which are obtained on evaporation.

$$2FeSO_4 + Cl_2 + ZnCO_3 . 2Zn(HO)_2 . H_2O = Fe_2(HO)_6 + ZnCl_2 + 2ZnSO_4 + CO_2.$$

Sulphate of zinc is isomorphous with and closely resembles sulphate of magnesium. From that salt it is readily distinguished by giving white precipitates with ferrocyanide of potassium and sulphide of ammonium.

Sulphate of zinc is soluble in about two and a half times its weight of water; the solution has an acid reaction. The crystals lose six molecules of water by the heat of a water-bath, but, like the other sulphates of the same class, it retains the seventh molecule even at much higher temperatures. Impurities would be detected by the tests already given. [Zinci Acet.]

PREPARATION OF A VERY ACTIVE CANTHARIDAL PLASTER.

BY PROF. G. DRAGENDORFF (Dorpat, Russia).

Apothecaries frequently complain that some cantharides do not furnish an active blistering plaster; that the same furnish, even when treated with acetic ether, an extract so poor in cantharidin, that with its aid no good Drouott's blistering tissue can be produced. In most cases the opinion is expressed that the flies contain too small a percentage of cantharidin. My experience teaches me to discredit the latter opinion. It is possible to obtain good preparations even from such apparently poor cantharides, it being only necessary to thoroughly extract the cantharidin they contain.

A few observations show how poorly this is commonly accomplished. According to my experience the amount of cantharidin in Spanish flies varies from 0·27 to 0·5 per cent. The coating of a vesicating tissue 20 c. m. long and twelve wide requires about 25 grm. plaster substance, containing usually about 6 grm. powdered Spanish flies, furnishing at least 0·016 cantharidin. 0·00002 grm. cantharidin suffice for a blistering surface of a square centimeter, or 0·0048 grm. for 240 square centimetres, or less than one-third of the smallest quantity that may be considered present in the plaster. Mechanical causes may partly be found to be the ones that prevent a thorough action of the plaster. A plaster of poor adhesiveness, not being in close contact with the epidermis, does not act because that close contact is wanting, which is necessary for the absorption of the cantharidin. It is also a mistake of several pharmacopœias to permit the use of coarsely-powdered cantharides, the quantity of cantharidin in which is not uniformly distributed in the plaster, even if the powder is heated for a long time with the oil.

Other causes, unnoticed heretofore, also weigh heavily in this direction. The cantharidin is present in the Spanish flies in several different combinations, in which it is firmly held. This fact I have mentioned already in my "Contributions to Toxicological Chemistry," on the different behaviour of flies towards various solvents. Cantharides with about 0·3 per cent. of cantharidin yield to water, even after repeated boiling with fresh portions of the same, only about half of their cantharidin, while the remainder is only yielded to potassa lye. In the same manner, alcohol, chloroform, and ether dissolve only 30 per cent. of the blistering substance. If all the cantharidin is to be extracted, bases like potassa or soda must be employed, which form easily soluble salts with the cantharidin. Together with Masing, I demonstrated years ago that the salts thus formed are energetic blistering agents. During the past two years, reference has occasionally been made to our observation, especially by Delpech and Guichard, recommending the cantharidates of soda and potassa as vesicants.

Without alluding to this further, I would say that by the aid of soda or pottassa the entire amount of cantharidin contained in the flies may be rendered active. The finely-powdered flies are mixed to a paste with diluted alkaline lye of about 1·1 sp. gr., heated in water-bath for twenty-five to thirty minutes, when sufficient muriatic acid is added, to have a trifling surplus of the same, and the whole mass is dried rapidly in the water-bath. The residue, which we may call "prepared cantharides," is powdered anew and employed for the preparation of the plaster, or for the extract with acetic ether for use upon tissue. The small quantity of potassium or sodium chloride present, is in no case injurious. The cantharidin is now present in the mixture in a free state. In a drug store in this city, where my proposition has been followed, no complaints have been made about the preparation.

Even for the preparation of the pure cantharidin, the above-mentioned process is worthy of attention. As I mentioned before, ether, alcohol, etc., dissolves from the cantharides, not "prepared," only a fraction of the cantharidin present.—*The Chicago Pharmacist.*

DISTRIBUTION OF ATROPINE IN THE LEAVES AND ROOTS OF THE BELLADONNA.

BY M. LEFORT.*

Therapeutists have been long divided in opinion as to the relative degree of activity of the parts of the belladonna plant most used in medicine, namely, the leaf

* Memoir read before the Paris Academy of Medicine, Nov. 21, 1872 (Journ. de Pharm. et de Chimie [4] vol. xv. p. 265.

and the root. Whilst according to the experiments of some authors, equal doses of the leaf and the root have appeared to possess properties absolutely identical, the experience of other observers has led them to consider the root to be more active and generally more constant in its results than the leaf.

In seeking for the origin of this divergence of opinion some points must be considered to which it is probably to be attributed: (1) the different times of the year at which the leaf and root are collected; (2) the great influence the age of the plant has upon the formation of atropine; and (3) the notable difference in composition between the cultivated plant and that growing wild or in the woods. It appeared to the author that well-directed laboratory experiments would best solve these questions, and he, therefore, undertook a great number of very minute analyses, the results of which are given in the present memoir.

1. *General Method of Analysis.*

Reviewed in a general aspect the dry belladonna leaf is composed of cellulose, chlorophyll, a salt of atropine, a nauseous poisonous principle, and a fatty or waxy substance characteristic of all vegetables. The root, on the contrary, is principally represented by cellulose, starch, inuline, asparagine, the nauseous fatty matters and a salt of atropine.

Atropine having hitherto been considered the essential principle to which all parts of the belladonna plant owe their therapeutic and physiological properties, the best method of estimating that alkaloid was sought. In the first place recourse was had to tannin and iodide of potassium, which produce with atropine precipitates that are very insoluble in water; but in studying carefully the composition of these deposits, it was found that they contained foreign matters that could not be separated by washing.

MM. Winckler, Planta, Richenau and Mayer have pointed out that the double iodide of mercury and potassium, or iodhydrargyrate of potash, is the reagent that best precipitates the vegetable alkaloids from aqueous solutions in the presence of colouring and other matters existing in the plant. The experience of the author in the examination of decoctions of the leaves and roots of belladonna is confirmatory of the observations of those chemists, the solution employed by him in all his analyses being—

Corrosive Sublimate	4·50	grams.
Iodide of Potassium	16·25	"
Distilled Water	50·00	"

In order correctly to compare the quantities of iodhydrargyrate of atropine furnished by the leaves and roots in different stages of growth, the analyses were conducted under conditions absolutely identical in all cases. 100 grams of the root or leaf was reduced to an impalpable powder, and completely dried in a stove. It was then treated with lukewarm rectified spirit until exhausted of all principles soluble in that vehicle. The greater part of the spirit was then distilled off, the residue heated in a water-bath to drive off the last traces of alcohol, and sufficient distilled water added to make an aqueous solution of 50 c. c. To this solution, filtered, was added the solution of iodhydrargyrate of potassium in slight excess, and the precipitate of iodhydrargyrate of atropine so formed collected on a weighed filter washed, dried, and fused in a platinum capsule. On cooling, the product was hard, transparent, brown, undecomposed by air, insoluble in water, but very soluble in alcohol.

The quantity of pure atropine present was then easily calculated, theory giving the proportion of the alkaloid in 100 parts of the iodhydrargyrate as 33·25. The author considers this method of estimating the quantity of atropine far preferable to those based upon its production in the free state, since he has found that the alkaloid is always more or less altered by the chemical agents used for its isolation.

2. *Atropine in the Leaves.*

The author's attention was directed first to ascertaining the time of the year at which the leaves of the belladonna plant are usually collected, and he found that both from the wild and the cultivated plant the gathering takes place through the months of May and June on to the end of August;* that is to say before, during and after the flowering of the plant. The first question to decide, therefore, was whether the leaf collected in the spring was as rich in atropine as that collected in the middle or at the finish of the summer. Some leaves, therefore, were obtained that were gathered from plants cultivated in the neighbourhood of Paris in the month of May,—that is to say, before the flowering,—and another part gathered in August at the time the berries commence to ripen. These too kinds of leaves gave the following results:—

Atropine in 100 *grams of dry powder.*

Experiment.	May leaves. Gram.	August leaves. Gram.
1	0·418	0·457
2	0·405	0·443
3	0·421	0·467
4	0·392	0·482

These analyses show that the belladonna leaf is less rich in atropine in the spring than after the floral organs have faded. It is true that the difference is so slight that there would be some difficulty in distinguishing between the physiological action of the two kinds; but the author considers that if the collection were not to take place till July or August, the results would be a medicinal agent nearly invariable in composition and possessing the largest quantity of the active principle.

Another question not less important was to determine the influence that cultivation exercised upon the proportion of atropine. Towards the end of July, therefore, one portion of leaves was obtained from plants cultivated in the neighbournood of Paris, and another from wild plants growing in the forest of Compiégne. These yielded the following results:—

Atropine in 100 *grams of dry powder.*

Experiment.	Cultivated leaf. Gram.	Wild leaf. Gram.
1	0·470	0·459
2	0·485	0·47[illegible]

So that, from these analyses, it appears that cultivation neither lessens nor increases the quantity of atropine, and that the medical man may have equal confidence in the leaf from the cultivated and from the wild plant, provided they are gathered at the same season of the year.

The conclusions drawn from the experiments on this part of the subject are:—(1) that the belladonna leaf is less rich in atropine before than after the flowering of the plant; (2) that its collection should always be made between the flowering and fructification; and (3) that the leaf of the wild and the cultivated plant contain identically the same proportions of atropine when gathered at the same time of the year.

3. *Atropine in the Roots.*

It has previously been mentioned that, except in atropine, the composition of the leaf was far from resembling the root of the belladonna, and this is a fact important to be remembered when it is sought to compare

* Gonesse, Choisy-le-Roi and Orly are the principal localities in the environs of Paris where the belladonna is specially cultivated. The leaf is not generally collected until the second year of the plant's growth, and is continued during eight, ten, or even twelve years, according to the nature of the soil. The collection is made twice in the year: the first towards the end of May; the second in August, or at the end of July.

their physiological and therapeutic properties. In former experiments * the dried leaf was found to contain 3 per cent. of a fatty matter, coloured by chlorophyll, giving off strongly the odour peculiar to the poisonous *Solanaceæ;* the dried root does not contain more than 1 per cent. of this matter, coloured yellow, with an odour equally nauseous, but not so pronounced. The nature of this poisonous principle, and the part that it plays in the preparations which contain it, is a subject worthy of investigation. Without doubt, plants produce upon the animal economy physiological effects as much more decisive as their chemical composition is itself more pronounced; but it must not be forgotten that their special therapeutical properties are often as much due to the combined action of the constituent principles as to the predominance of one. So that, considering the difference existing in the composition of the belladonna leaf and the root, it is difficult to make a comparison between them as to their therapeutic action, and they should rather be looked upon as relatively than absolutely similar.

From the manner in which the plant is developed, there is great difficulty in fixing the time of the year when the atropine is present in the root in the largest proportion. It is well known that the belladonna plant forms each year one or more fresh roots that soon acquire considerable size, partly at the expense of the old ones, which are thus deprived of a portion of their atropine. As the belladonna plant lives at least from eight to twelve years, according to the nature of the soil, it follows that there is great variation in the composition of these roots.

In France the collection and selection of the roots are carried on by persons badly qualified for the work. The wild roots are gathered at any time; and, provided that they be not too spongy, are handed over just as they are to the dealer, who contents himself with cleaning them, splitting the larger roots to facilitate their drying. The cultivated roots are collected in an equally defective manner. When the plants are old, and produce few leaves, they are pulled up in order to replace them by new plants, and the portion of the roots that is not hollow is taken; so that the produce which comes into the hands of the druggist consists of roots of every size and age and extremely variable in the proportion of atropine they contain. Analyses of roots of different ages gave the following results:—

Atropine in 100 *grams of dried powder.*

Experiment.	Root 2 to 3 years old. Gram.	Root 7 to 8 years old. Gram.
1	0·4718	0·2541
2	0·4886	0·3128

These numbers show the mean result; since, while some roots contained less than three grams per kilogram, others contained more than five grams. One specimen, said to have come from the Swiss mountains, yielded nearly six grams, the largest proportion that was met with. This variation would seem to indicate that, with regard to the atropine, the leaf is more trustworthy than the root.

For a considerable time French manufacturers of atropine have preferred the German or Swiss roots to those collected in their own country. This preference the author considers, from experiments, to be due, not so much to the difference in the root, as to the care with which the collection is conducted. The belladonna root differs much from that of other herbaceous or perennial plants containing powerful alkaloids, such as henbane, stramonium, or aconite. In the aconite, for instance, M. Duquesnel has found † that the root contains more aconitine than the leaf; but whilst the aconite root does not grow much larger than the thumb, the belladonna root grows with such rapidity that it is not unfrequently met with as large as the arm. It is well known that in very large roots the cortical part is less abundant in proportion than in smaller roots. A kilogram of belladonna roots eight or nine years of age would contain about 300 grams of bark; the same weight of three-year old roots would contain about 400 grams. So that, as the bark, both of the root and the stem, always contains a larger proportion of the active principle than the medullary layers, this difference of 25 per cent. of bark in favour of young roots explains the foregoing results of analyses.

The principal conclusions drawn from this part of the investigation are:—(1) that in general composition the root differs notably from the leaf; (2) that the older the root is, the smaller the proportion of atropine that it contains; (3) that though the root is frequently richer in atropine than the leaf, the proportion is much more variable, and therefore the leaf would have more uniform therapeutic properties.

* Journal de Pharm. et de Chimie [4], vol. xi. p. 102.
† See *ante*, p.663.

CHINESE CHEMICAL MANUFACTURES.*

BY F. PORTER SMITH, M.B.

(*Concluded from page* 1009.)

The ashes of Polygonum plants, forming a rough salt of potash, were formerly used as a flux for minerals, and as an addition to cane-juice to neutralize the acid present. This latter purpose is now fulfilled by using lime, a chemical substance formerly handled by experimenters. Sulphate of soda, named *Hieunming-fen* after *Liu Hieun-chin*, the Glauber of Chinese alchemy, who flourished during the reign of the second *T'ang* emperor, has received much attention at the hands of Chinese operators, who give minute and ridiculous directions for the purification of this salt, which is found as an efflorescence upon the ground of some parts of the country. It is, naturally enough, confounded with the natural nitrates of potash and soda so common in both China and India. It was anciently believed to be one of the substances capable of inducing longevity, and to be a panacea for most sicknesses. Sulphate of magnesia, or Epsom salts, is referred to in the *Pen Ts'au* as a "bitter nitre," prepared from the mother-liquor of the salt-pans. Judging from the deliquescent character of all the salt made or met with in China, the plan of removing this magnesian element from the crude salt is not practised at the present time. The phenomena of deflagration and crackling of salts of potash and soda are so frequently referred to in Chinese works as to lead us to believe that they practised something equivalent to our blowpipe examinations of substances. The use of fire to distinguish arsenical substances, such as black (metallic) arsenic, white arsenic (arsenious acid), and yellow arsenic (orpiment), as by the varying smell of these substances, indicates a step in the direction of practical chemistry. Passing on to alum, as the last of these alkalies, or alkaline earths, we touch upon an interesting subject. The making of alum, as at Wan-chau-fu in Chehkiang province, from the alum-shale of the hills of that prefecture, is an extensive business. The alum is exceedingly pure and exceedingly cheap. Its uses in sizing paper, in making mucilage, and in many chemical and economical processes are even less important than its employment day by day in the purification of drinking-water—a chemical operation. The Chinese formerly employed carbonate of soda for this purpose, thereby yielding a much softer water than the alum process does. The author of the *Pen Ts'au* curiously enough recommends the use of leaden vessels to hold water, liable to produce goitre.

* Reprinted from 'Transactions of the North China Branch of the Royal Asiatic Society.'

Metals have received much attention at the hands of the Chinese, who revel in alloys, and love the cheap thunder of gong-metal, and the musical ring of pieces of silver. Copper is regarded by Chinese writers as more friendly to the human constitution than iron, and they prefer the former metal for the making of cooking and washing vessels. Malachite is well known to them, and sulphate of copper, or *Shih-tan*, is described in their works, although never met with in Hankow. Steel needles dipped in a solution of sulphate of copper have been sometimes sold to foreigners as curiosities in the way of well-tempered metallic copper. Although aware of this decomposition of one metal by another, the Chinese have misunderstood it, and they have been led into the assertion that one metal undergoes conversion into the other. Verdigris, a basic acetate of copper, is easily procured by the action of vinegar on plates of copper. Vinegar is the only pure acid substance known to the Chinese. They use it as a solvent; and by sprinkling it upon minerals exposed to the fire, they bring about oxidation and solution of these substances. It is curious that they have never learnt to distil acetic acid from their strong but rank vinegar. Verditer, a carbonate of copper, is largely made by the Chinese in Hupeh, and is mixed with rice-starch for some reason best known to themselves. It occurs in small, thin, square, pale green pieces, and is used in dyeing shagreen cases for pipes and spectacles. There is a process described in a Chinese work by which wood to be placed in water is preserved by previously dressing it with acetate of copper solution. This is something like the Kyanizing process, in which corrosive sublimate is similarly employed. Iron, a metal abundantly bestowed upon China, yields oxides and the sulphate of iron in various forms. The black oxide of iron dissolved in vinegar was formerly employed by the Chinese as an ink. The characters were written with this solution, and the pencil, dipped in the ordinary Chinese or Indian ink, was used to trace over the characters on the other side. The red sesquioxide of iron is made on a large scale by heating impure sulphate of iron to a great heat. The hotter the fire the better the colour, so the *Pen Ts'au* says. This rouge is used to colour porcelain, and to redden walls of temples and palaces. Sulphate of iron is made in a crude and cheap form by mixing together sulphurous coal and hepatic iron pyrites, and covering the heap with mortar and mud to prevent the access of air. Spontaneous chemical action occurs, and the mass which results is treated with water, and the rough green salt is crystallized out. This is sold at a very cheap rate, and is much used as a dye, after mixture with galls or other substances. It makes a very good disinfectant for sewers, urinals and the night-stools of the sick-room. A preparation of great beauty, called *Tieh-hwa-fen*, is made by acting upon sheets of iron with vinegar. It resembles the citrate of iron in its appearance. The Chinese seem to be aware of some sort of identity of the colouring matter of the blood with these iron preparations recommended in diseases of the blood.

Lead is scarce in China, comparatively. It is spoken of as the "black metal," and is regarded as masculine, and the progenitor of the five principal metals. Lead, zinc, antimony and pewter are not carefully distinguished. There was formerly considerable communication between Persia and China. Persia sent lead, zinc, ores of silver and amalgams to China. Argentan, or German silver, called *Peh-t'ung*, is an alloy of copper, arsenic and zinc, largely prepared for use in making tobacco-pipes. The use of sal ammoniac as a test for these alloys, showing them to contain copper and to be not silver, is another item of chemistry met with in the *Pen Ts'au*, the manual of the Chinese chemical manufacturer. Acetate of lead is a salt much extolled by Taoist writers as a styptic remedy. A plan of making a salt, supposed to be an acetate, is given in the *Pen Ts'au*, by which an amalgam of fourteen parts of lead with one of mercury is acted upon by vinegar. This must issue in the formation of white lead, a salt made at many places in China, and largely used as a paint and as a face-powder. It would be curious if it should turn out, as may be expected, that an amalgam of lead and mercury, the latter being in very small proportion, is much more readily acted upon than the fine metal by vinegar. White lead was known in the days of the Great Yü, the engineer-monarch, and most certainly during the *Shang* dynasty. Shin-chau in western Hunan, and Kwang-sin-fu in Kiangsi, being both in the midst of rich mineral tracts of country, have been long famous for their chemicals. The most interesting and important substances of all are the mercurial preparations made for ages by the Chinese. Mercury, called "water silver," the exact equivalent of the Latin and Greek names for quicksilver, has had a mysterious attraction for the Chinese alchemists. Its liquid and volatile character, the beautiful colours of its compounds, and the powerful effect of its preparations, all tend to render it the hope of the chemist in search of omnipotent gold or immortal drug. Cinnabar, the most frequent ore of mercury, is also made artificially on a large scale in Hankow and other places, by fusing a mixture of sulphur (two catties) and mercury (one catty) and subliming it. To give a sample of Chinese philosophy, it may be observed that one author quoted in the *Pen Ts'au* says that by the absorption of the spermatic (or *Yang*) principle, a crude matrix is produced, which in a period of 200 years becomes pure cinnabar. This, in 200 years, becomes lead; in 200 years more it is silver, and in 200 years more of gestation it becomes pure gold. The nature of this sulphide of mercury was thoroughly understood by the early Chinese operators. The power of raising men to the rank of the eight jolly immortals called *Sien*, or "genii," was asserted of this mysterious substance, which defied heat and came forth a pure and mobile metal. They called it the *Sien-tan*, or "philosopher's stone," a name perhaps more properly assigned to a substance formed by the mixture of some eight substances. More than ten sorts of cinnabar are described in old works. That from Shin-chau-fu, in Hunan, has had the greatest reputation, and given its name to this chemical. Vermilion is made in much the same way in Hankow as the cinnabar which has the same chemical composition. The crystalline sublimate formed on the sides of the vessel is carefully powdered between two stones turned by the hand, a little water being added from time to time. The pasty mass is then carefully levigated by mixture with pure water, decanted, and dried upon tiles in the sun, in just the same way as described by Dr. Williams in his 'Chinese Commercial Guide.' The more patiently and carefully the cinnabar is powdered and washed, the finer is the colour of the resulting vermilion. It is packed in glazed black paper, and exported in large quantities. Æthiops mineral is a common drug, used in medicine as an alterative, and made by melting two Chinese ounces of sulphur and then adding to it half a catty of mercury. The mass is taken out, powdered and sublimed. It is sold in heavy, broken pieces, of a brilliant maroon or purplish-red colour, and crystalline or striated in structure. It corresponds exactly to the old officinal preparation of European Pharmacopœias. Calomel is made in large quantities in Hankow, in much the same way as that given by Mr. Pearson in the third volume of Sir J. Davis's work on 'The Chinese.' Common salt, mercury and alum, or salt, mercury, sulphate of iron and nitre are rubbed together in certain proportions, and put into an iron platter, which is covered over with a roomy earthen dish well luted down. This is exposed to the heat of a strong charcoal fire for four hours, when water is thrown upon the upper pan, and the removal of it shows the calomel condensed in the form of a beautiful, white, glistening, feathery sublimate upon the inner surface of the upper dish. It is the delicate appearance of this preparation which probably has induced the Chinese to call it the "light powder." It is often adulterated, as Mr. Daniel Hanbury has pointed out in his valuable Notes on Chinese Materia Medica,' with selenite, or sulphate of lime, which happens to be of nearly the same weight and crystalline form. There are some seven or eight manufacturers of this drug in Hankow. It sells at a price varying from sixpence to a shilling per ounce.

Corrosive sublimate, called literally "white precipitate," is also made in Hankow by a very complicated way, by fusing together nitre, mercury, borax, sal ammoniac, orpiment and massicot, and subliming the mass in the same way as the calomel. A very good crystalline preparation is obtained, which is used only externally as a caustic. The lead is added on medical, and not on chemical grounds, as it is supposed to correct the poison of the salt. Red precipitate is made by putting nitre into a small boiler and melting it, alum being afterwards melted and incorporated with it. Some mercury is put into the middle of the mass; and, after covering it over with a small dish, the whole is heated for about an hour and a half. The heat is at first gentle, and is then gradually increased. The red precipitate, or red oxide of mercury as it is, is taken out in the form of sublimated scales, of a bright brick-red colour. A nitrate of mercury, mixed with the red oxide, is sold under the same names as the red precipitate. A turbith mineral, or yellow sulphate of mercury, is also sometimes made by the Chinese.

Several metallic substances, such as minium and massicot, have been purposely passed over in this very brief and hurried sketch.

One more chemical substance, of an organic or animal character, shall be named as the last of this list. Urea, called *Ts'iu-shih*, is a regular article of manufacture from human urine at Ngan-king-fu and Chi-chau-fu, in Nganhwei province. This substance, mixed with the other constituents of the excretion, is obtained by boiling down urine, sulphate of lime or common salt being added to hasten the crystallization and to increase the quantity obtained. It is used to soften fresh meat required for immediate use, and is used in medicine.

Sufficient evidence, it is hoped, has been produced to show that there is such a thing as chemistry in China, and that those who take upon themselves to teach the Chinese chemistry would do well to first address themselves to the explanation of processes and terms already in the hands and mouths of the Chinese for many hundreds of years.

THE BARK OF JUGLANS CINEREA.

BY CHARLES O. THIEBAUD.*

A quantity of the fresh bark was gathered, carefully dried and powdered. From a portion of this a decoction was made, and the following reactions observed. No precipitate occurred after acidulation with nitric acid by iodo-hydrargyrate of potassium, thus proving the absence of an alkaloid. Dilute solutions were reddened upon the addition of an alkali. The vapour arising from both the decoction and aqueous extract gave acid indication to moistened litmus, the vapour from the extract turning it a decided cherry-red colour. A portion of the powdered bark, moistened with water slightly acidulated with sulphuric acid, and introduced into a retort, gave a straw-coloured distillate with a faint fusel oil odour, acid to litmus, and reddened by alkalies. This being made slightly alkaline by ammonia and set aside in a drying-closet, after evaporation to dryness, yielded a small quantity of slightly yellowish prismatic crystals, scarcely soluble in alcohol, and with acid reaction. The bark distilled with pure water gave a distillate with acid reaction, but deposited no crystals upon evaporation. The distillate obtained by treating the bark with water rendered slightly alkaline by carbonate of soda was neutral to test paper. These experiments prove a volatile acid to be present in the bark.

The decoction was treated by acetate of lead, the precipitate suspended in water, freed from lead by saturation with hydrosulphuric acid and filtration; the solution evaporated to dryness on a water-bath, exhausted by alcohol, and the alcoholic solution evaporated in the drying-closet to a resin-like extract. This was redissolved in alcohol, and set aside in a cool place. After a few days small acicular crystals were found floating on the liquid. These crystals were in small quantity colourless, and coloured litmus red.

The filtrate was freed from lead by hydrosulphuric acid, and evaporated to dryness on a water-bath; the residue, exhausted by alcohol and evaporated, yielded a bitter extract-like mass, soluble in both alcohol and water.

These results not proving satisfactory by the isolation of an acid in quantity sufficient for further examination, the peculiar solvent properties of true benzole were brought into requisition.

A portion of the freshly dried and powdered bark was macerated in this menstruum for four days. The benzole, which at first was colourless, after separation from the refuse matters by expression and filtration, was of a decided bright yellow colour. This was set aside and allowed to evaporate spontaneously. After the evaporation had been carried on until the residue ceased to lose weight, the capsule was found to contain a thick oily substance, and the sides were covered by short acicular crystals of a bright orange-yellow colour. These exhibited decided acid properties to litmus, were soluble in alcohol and ether, but scarcely so in water. They volatilized without fusing, in solution were reddened by ammonia, and turned pale violet by potassa, afterwards becoming red. The oily residue remaining after the evaporation of the benzole was exhausted with alcohol and the alcoholic solution by spontaneous evaporation yielded crystals similar in form, size and reaction to those deposited on the side of the capsule. The residue insoluble in alcohol was taken up by ether, allowed to evaporate spontaneously to a syrupy consistence, and spread on bibulous paper; thin tabular crystals were obtained which were colourless, acid to litmus, insoluble in water, scarcely so in alcohol, but readily taken up by ether, which solution was not precipitated by chloride of calcium and not affected in colour by ammonia or potassa. They were fusible, but being further heated partly volatilized, leaving behind a charred mass, which burned without residue. The crystals when fused were changed to a dark red liquid, which when treated by ether became decolorized.

Chrysophanic acid is soluble in benzole; and since from *Juglans*, by the use of the same solvent, a product is obtained which exhibits some of the characteristics of the former, we may regard the two acids as closely related. The proper name of this constituent would be juglandic acid.

Solution of sulphate and tincture chloride of iron produced dense dark-coloured precipitates, but other tests did not prove the presence of tannin.

The decoction affords precipitates, and hence is incompatible with the sesqui- and proto-salts of iron, bichromate of potassium, sulphate of copper, acetate of lead, and nitrate of silver. No effect is produced by yellow and red prussiates of potassium, tannin, and antimonial salts.

The bark contains bitter extractive, a large amount of oily matter, juglandic acid (which appears to be related to chrysophanic acid), an acid crystallizing in tabular colourless crystals, a volatile acid, and no tannin. The ashes were found to contain a considerable percentage of potassium, with traces of sodium, calcium, and aluminium.—*Amer. Journ. Pharm.*

* From an Inaugural Essay.

THE TALLOW TREE AND ITS USES.

BY D. J. MACGOWAN, M.D.

The botanical characters of this member of the *Euphorbiaceæ* are too well known to require description; but hitherto no accurate account has been published of its various uses. Although it has become a common tree in some parts of India and America, its value is appreciated only in China, where alone its products are properly elaborated. Analytical chemistry shows animal tallow to consist of two proximate principles—stearine and elaine. Now, what renders the fruit of this tree peculiarly interesting is the fact that both these principles exist in it separately in nearly a pure state. Nor is the tree prized merely for the stearine and elaine it yields, though these products constitute its chief value; its leaves are employed as a black dye; its wood is hard and durable, and may be easily used for the blocks in printing Chinese books and various other articles; and, finally, the refuse of the nut serves for fuel and manure.

The *Stillingia Sebifera* or tallow-tree is chiefly cultivated in the provinces of Kiang-se, Kiang-nau and Chih-kiang. In some districts near Hang-chau the inhabitants defray all their taxes with its produce. It grows alike on low alluvial plains and on granite hills, on rich moulds on the margin of canals, and on the sandy sea-beach. The sandy estuary of Hang-chau yields little else. Some of the trees at this place are known to be several hundred years old, and, though prostrated, still send forth branches and bear fruit. Some are made to fall over rivulets, forming serviceable bridges. They are seldom planted where anything else can conveniently be cultivated, but generally in detached places, corners about houses, roads, canals, fields, etc.

In winter, when the nuts are ripe, they are cut off with the twigs by a sharp bill hook attached to the extremity of a long pole, which is held in the hand and pushed upwards against the twigs, removing at the same time such as are fruitless.

The harvesting accomplished, the capsules are taken and gently pounded in a mortar to loosen the seeds from their shells, from which they are separated by sifting. To facilitate the separation of the white sebaceous matter enveloping the seeds, they are steamed in tubs having convex, open wicker bottoms, and placed over cauldrons of boiling water. When thoroughly heated they are mashed in the mortar and then transferred to bamboo sieves, kept at a uniform temperature over hot ashes.

As a single operation does not suffice to deprive them of all their tallow, the steaming and sifting is therefore repeated. The article thus procured becomes a solid mass on falling through the sieve, and, to purify it, is melted and then formed into cakes for the press. These receive their form from bamboo hoops, a foot in diameter and three inches deep, which are laid on the ground over a little straw. On being filled with the hot liquid, the ends of the straw underneath are drawn up and spread over the top, and, when of sufficient consistence, are placed with their rings in the press. This apparatus, which is of the rudest description, is constructed of two large beams placed horizontally so as to form a trough capable of containing about fifty of the rings, with their sebaceous cakes. At one end it is closed, and at the other adapted for receiving wedges, which are successively driven into it by ponderous sledge hammers wielded by athletic men.

The tallow oozes in a melted state into a receptacle, where it cools. It is again melted and poured into tubs smeared with mud to prevent adhesion. It is now marketable in masses of about eighty pounds each, hard, brittle, white and opaque, tasteless, and without the odour of animal tallow. Under high pressure it scarcely stains bibulous paper; it melts at 104° Fahr. It may be regarded as nearly pure stearine; the slight difference is doubtless owing to the admixture of oil expressed from the seed in the process just described. The seeds yield about eight per cent. of tallow, which sells for about five cents per pound.

The process for pressing the oil, which is carried on at the same time, remains to be noticed. It is contained in the kernel of the nut; the sebaceous matter which lies between the shell and the husk having been removed in the manner described, the kernel and the husk covering it are ground between two stones, which are heated to prevent clogging from the sebaceous matter still adhering. The mass is then placed in a winnowing-machine precisely like those in use in western countries. The chaff being separated, the white oleaginous kernels are exposed, and, after being steamed, are placed in a mill to be mashed.

This machine is formed of a circular stone groove twelve feet in diameter, tapering at the edge, and is made to revolve perpendicularly by an ox harnessed to the outer end of its axle, the receiver turning in a pivot in the centre of the machine. Under this ponderous weight the seeds are reduced to a mealy state, steamed in tubs, formed into cakes and pressed by wedges in the manner before described, the process of mashing, steaming and pressing being likewise repeated with the kernels.

The kernels yield about thirty per cent. of oil. It is called *tsingyu*, and sells for about three cents per pound. It answers well for lamps, though inferior for this purpose to some other vegetable oils in use. It is also employed for various purposes in the arts, and has a place in the Chinese pharmacopœia, because of its quality of changing grey hair to black, and other imaginary virtues. The husk which envelopes the kernels and the shell which encloses them, and their sebaceous covering, are used to feed the furnaces; scarcely any other fuel is necessary for this purpose. The residuary tallow cakes are also employed for fuel; a small quantity of it remains ignited a whole day. It is in great demand for chafing-dishes during the cold season.

Finally, the cakes which remain after the oil has been pressed out, are much valued as a manure, particularly for tobacco fields, the soil of which is rapidly impoverished by that plant.—*Scientific American.*

NEW MATERIAL FOR BRICKS.

During the last few years experiments have from time to time been made with the view to utilize in some way the mounds of shale (the refuse of the coal mines) which cover an area of several thousands of acres in South Staffordshire by converting them into bricks. Several enterprising firms have already embarked in this novel but profitable business. When properly pulverized, the shale is found to be an excellent material for the purpose, the bricks produced being hard and durable, resembling in colour the fire-clay bricks of the Stourbridge district, although for furnace and such like purposes they are not so valuable. For ordinary building, however, they are found to be of equal practical value to the ordinary red bricks, the only possible objection to the former being their colour, which is somewhat too light for a smoky district like South Staffordshire. This objection, however, could only apply to their use for buildings of architectural pretensions, and such buildings in the black country do not predominate. There is every reason to believe that this method of utilizing the innumerable dusky hillocks which disfigure the South Staffordshire landscape will gradually develope into an industry of some importance. The material is to be had in any quantity for a mere nominal sum, and its exhaustion in those parts of the district where the collieries are worked out would be doubtless followed by a restoration of the landscape to a much nearer resemblance than it now bears to its former beauty.—*The Times.*

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REPORTERS AT THE COUNCIL TABLE.

MOST of our readers were probably somewhat astonished at the very full report which appeared in the Journal of the 8th instant of the proceedings of the June Meeting of the Council. The subject which excited most interest and discussion was one that afforded ample scope for the arguments of those who advocate the view that these proceedings are *public*, as well as of those who, on the other hand, maintain their *private* character. Ultimately it was resolved,—"That it is desirable that such reporter or reporters as the Council may desire to invite be allowed the opportunity of reporting the proceedings;" and a Committee was at once appointed to inquire into and report as to the best means of carrying into practice the foregoing resolution.

For the benefit of those who have not closely followed the doings at the Council table, it will not be out of place to mention that a reporter engaged by the Council has been taking shorthand notes for the last year; and that a Committee, consisting of the PRESIDENT, VICE-PRESIDENT, and Mr. SANDFORD, has each year been specially appointed to decide what portion should be published and what suppressed. Accordingly, monthly reports, based on the notes of the shorthand writer, have been regularly furnished to this Journal by the Committee.

It would seem, however, that this system is not satisfactory to the present Council, who imagine that a complete *verbatim* report should, as a rule, be published; and some even affirm the necessity of inviting other reporters, to be paid by the proprietors of any journal that may find it to its advantage to head its report with the magic words, "By our *own reporter.*"

The discussion turned more upon the question as to how much was fit, or ought, in the interests of the Society, to be published than upon the main point of *open* reporting; and the majority of the supporters of the resolution avowed, so far as we can judge from their remarks, the expediency of some sort of control over the publication other than that exercised by the editorial staff of most journals. They did not, and possibly could not, state the nature of the supervision they would wish to see exercised, and left what was somewhat facetiously called this matter of *detail*—practically, the whole subject—to be settled by the Committee first referred to.

It is perhaps needless to say that this question of reporting has been very fully discussed more than once at the Council table, and the conclusion come to that open reporting would not conduce to the material interest of the Society, but might minister to the vanity of tall talkers, and seal the lips of some of the quiet, wise men on whose judgment the Council has often had good reason to rely.

We confess that we regard this view as somewhat overstrained; and indications are not wanting that the old as well as the new element on the Council are at one in their desire to kindle and maintain amongst the members generally an interest in their proceedings. The members themselves have also, in very plain language, expressed their wish to know more about the public business of the Council; but the distinction between public and private business is the difficulty which has to be satisfactorily solved before *open* reporting can be considered to be agreeable to many even of the councillors who spoke in favour of the resolution.

One of our correspondents in last week's issue remarks very justly that it is not only quite usual but the rule for representative bodies, charged with administrative and executive duties, to conduct their deliberations privately, but that legislative functions are properly exercised in public. A glance at the work of the last four years shows that the truly legislative functions vested in the Council are exceedingly few as compared with the executive duties of carrying on what may be termed the trade (is not a handsome profit realized out of it?) of a great examining and educating body having much subsidiary business attached to it. Though we ourselves concur in the opinion that a full report of *most* matters pertaining to the administration of the Society might be published with positive advantage to the Council and gratification to the members, we are bound to admit that it would be impolitic not to have some means by which any one councillor can exercise that absolute freedom of speech which is obviously of grave importance under certain circumstances. Cases of this kind would not be of frequent occurrence but when they have to be dealt with they would be best suited for discussion before the whole Council rather than in any Committee.

We cannot fail to see that, whatever scheme is adopted, the PRESIDENT and VICE-PRESIDENT will have to exercise considerable firmness and judgment to prevent discussions which may tend to lessen the respect we all feel for the Council.

There is every reason to believe that the Committee will solve the difficulty in a manner creditable to themselves and satisfactory to the members.

PHARMACY IN THE SOUTHERN STATES OF AMERICA.

We are frequently applied to for information respecting the rate of payment and the comparative advantages offered to pharmacists in different parts of the world. We are, therefore, glad to be able to give a quotation from a letter upon this subject received from a correspondent at Memphis, Tennessee, U.S. He says:—

"Salaries are much higher here than in England, or even Canada. I receive now 100 dollars, or £20 a month, and shall, at the end of the present month, be receiving 125 dollars a month. Expenses are, however, much heavier, as it is impossible to live here under 600 dollars a year, which, however, leaves a fair margin for saving. Rents are enormous. For the shop and five rooms upstairs, this firm pays £700, or 3500 dollars a year. . . . Good dispensers are well paid here, receiving from 1000 dollars to 1500 dollars a year; but it is difficult for a stranger to get into a place. English diplomas,—of the Pharmaceutical Society, for example,—are highly esteemed, being considered much more reliable than those granted in this country. In fact, of American diplomas those of Philadelphia are the only ones of any value in the south."

We learn from Ceylon that, in consequence of the higher price realized in the home market for the bark of *Cinchona officinalis* over that of *C. succirubra*, considerably more attention is now being given to the cultivation of the former species. A single firm in the island, whose exportation of *C. officinalis* realized in England as much as 3*s.* 3*d.* per pound for unassorted bark, has applied to the Government plantations for as many as 350,000 plants.

In the neighbourhood of Port Lincoln, South Australia, large quantities of the malvaceous plant *Plagianthus spicatus*, Bth., have recently made their appearance, and have proved fatal to cattle and sheep, who appear to be very fond of the young flower-spikes. The plants are stated to appear periodically. One resident communicates to Dr. Schomburgk that he had not seen it in his neighbourhood for fully five years, and never in such large quantity. After a bush fire which happened recently in the district, the plants suddenly sprang up over hundreds of acres of land, and in many places they were so thick that a man could only with difficulty walk through them. They grow to a height of from three to five feet. The tops of the flower-spikes appear to be the parts most relished by cattle and sheep, and these portions are said to be the most poisonous. The first effects upon the animals, after eating them, are described as a kind of trembling, succeeded by a rapid and total loss of muscular power, so that they fall and die in great agony in the course of a few hours. A *post-mortem* examination shows the liver, stomach and viscera to be much inflamed. Hundreds of cattle and sheep are reported to have died from eating the plants. The fact of this poisoning is worthy of note, belonging as the plant does to an order celebrated for its harmless and mucilaginous properties.

Transactions of the Pharmaceutical Society.

EXAMINATION IN LONDON.

June 14th, 1872.

Present—Messrs. Allchin, Barnes, Bird, Carteighe, Cracknell, Davenport, Gale, Haselden, Ince and Linford.

Forty-five candidates presented themselves for the Modified Examination; of these, *eighteen* failed. The following *twenty-seven* passed, and were declared qualified to be registered as Chemists and Druggists:—

Bannister, Theophilus Mayo	Nottingham.
Binge, Alfred	Islington.
Biss, John William	Southsea.
Boden, Henry	Tottenham.
Chant, Herbert Alfred	Langport.
Cutforth, John Dixon	Manchester.
Davies, Thomas Burton	Hawarden.
Friend, William	Braunton.
Gorton, Charles	Whitechapel.
Hepburn, John	Fraserburgh.
Hilton, William	Whitefield.
Insull, Edward Samuel	Shelton.
Kitchen, George Seaton	Stamford.
Knight, George Edward Moses	Southampton.
Learoyd, William Valentine	Manchester.
Miller, Henry	Jersey.
Monkhouse, Henry	Derby.
Pechey, Henry	London.
Plumridge, Charles	London.
Pride, Arthur Edwin	Nottingham.
Prytherch, Rees	Llandovery.
Roberts, David Watkin	Chester.
South, George	Camden Town.
Speight, Robert	Lincoln.
Thomas, William	St. Leonards.
Trim, Edmund	London.
Wilcox, William	Dover.

Provincial Transactions.

NORTHAMPTON CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

The monthly meeting of this Association was held on June 7th; Mr. Masters, President, in the chair. There was a large attendance of members. A specimen of *Conium maculatum*, eight feet high, gathered on the previous botanical ramble, was exhibited.

The Secretary (Mr. Druce) read the minutes of last meeting and various letters which had been received during the month, and announced that they had received for their Prescription-Book fifty local prescriptions from Messrs. Tigar and Bird, six of Dr. Ware's from Joseph Ince, Esq., and sixteen from J. Baynes, Esq., Hull, containing specimens of Dr. Humphrey Sandwith's and Sir Henry Cooper's prescribing. Messrs. Evans, Lescher and Evans had kindly promised them a Materia Medica Cabinet, which would be lent to the members for a specified time.

Mr. Lance read a paper on "Myrrh; illustrative of its origin, history, description and preparations."

Mr. Masters read a paper on the "Storage of Poisons," containing many useful suggestions.

Mr. Sheppard read an essay on "Education," which led to a long discussion.

Proceedings of Scientific Societies.

SOCIETY OF ARTS.

April 24, 1872.

NUTS, THEIR PRODUCE AND USES.

BY P. L. SIMMONDS.

(*Concluded from page* 1020.)

TURNERY NUTS AND ORNAMENTAL SEEDS.

Of nuts for turnery and ornament there are not many received in this country, but a few have some degree of commercial importance, and one or two others may be incidentally noticed.

Our continental neighbours seem to be more shrewd and clever than we are in applying nuts and seeds to purposes of personal decoration; and although, from being cheap, many of these ornaments are despised by our belles, yet none can deny their interest and beauty and the ingenuity and taste with which they are arranged. The field is an exhaustless one, and many well-known ornamental nuts and seeds of India and South America have not yet made their appearance in this country.

The vegetable ivory nuts of commerce, corosso-nuts as they are usually termed, and tagua by the Indians of Magdalena, are the fruit of the *Phytelephas macrocarpa* a South American palm. The fruit, a collection of from six to seven drupes, forms clusters which are as large as a man's head, and stands at first erect, but when approaching maturity, its weight increasing, and the leaf-stalks, which up to that period supported the bulky mass, having rotted away, it hangs down, and the creeping caudex is seldom higher than six feet. A plant bears at one time from six to eight of these heads, each weighing, when ripe, about twenty-four pounds. The drupes are covered outside with hard woody protuberances. Each contains from six to nine seeds, but generally seven. From the kernels (the hardened albumen) the European turners fashion the knobs of walking-sticks, the reels of spindles, small boxes, and various little toys. It is of the same nature as the nutmeg and the pulp of the cocoanut, which in some palms becomes more hardened. That of the date, the *Raphia vinifera*, the talipat palm, and others, is quite as hard, but it is neither large enough nor white enough to be of use to the turner. In contact with sulphuric acid, the vegetable ivory takes a splendid red colour, almost equal to magenta. This colour, at first pink, then bright red, becomes much deeper and more purple when the acid has been allowed to act for about twelve hours.

The demand for vegetable ivory nuts is largely on the increase for button-making and other purposes; as much as a ton a day is frequently worked up in Birmingham. In 1870 we received 31,430 cwt., valued at about £20,000.

The waste and shavings of this nut furnish a good charcoal, which is utilized by some chemists. A paragraph has lately been going the round of the papers, stating that the turnings and raspings of the nut are used to adulterate ground bones; but this I much question, as they could scarcely be obtained in quantity. The value of the other nuts imported for turning, etc., besides the vegetable ivory nuts, is about £20,000.

The coquilla-nut, the produce of *Attalea funifera*, one of the palms which yield the piassaba fibre of commerce, is another ornamental turning-nut, but of a dark mahogany colour. The supplies of this, however, from South America have been failing, owing to the indiscriminate destruction of the trees, and the nuts imported lately have been small and immature, and therefore not appreciated and useful. The cohune-nut, from another species of the same palm, can also be turned into little articles. In Bogota they have small nuts, exceedingly hard, called toparos, which are often made into tinder-boxes, adorned with silver.

The seeds of the shreetaly, or talipat-palm (*Corypha umbraculifera*), being a species of vegetable ivory, are turned into marbles, beads used by certain sects of Hindoos, button-moulds, and various minute articles. Little bowls and other fancy ornaments are made from them, and when polished and coloured they are easily passed off for genuine coral. These nuts could be obtained in large quantities in Canara, Malabar, and other parts of India; the chief objection is that they are of such small size.

The fruit of the doom-palm is turned into beads for rosaries, and in Africa is made into little oval-shaped cases for holding snuff.

The betel-nut, the produce of the *Areca catechu* palm, may here be incidentally known, because it has been turned into ornamental articles, although its principal uses are for other purposes. Small quantities are imported for making tooth-powder and paste, and as a dog medicine; but in India a large commerce is carried on in this nut, chiefly as a masticatory; catechu is also made from it. Betel-nuts are pale when mature, but dark coloured when collected and dried in an immature state, hence the distinction of red and white nuts in the Eastern bazaars, the former being only half the value of the latter. About 4000 tons of these nuts are annually shipped from Ceylon to different quarters. At Travancore the quantity grown is enormous: in Penang 3000 tons are produced, and in Sumatra 4000 to 5000 tons.

The nuts of various other palms have some few useful applications. The grugru-nuts, the seed of *Acrocomia sclerocarpa*, are turned and carved into very pretty beads, rings, and other small articles, the hard black texture of the nut taking a fine polish.

The albuminous fruit of *Raphia vinifera* are carved into little figures by the African negroes.

Peach, cherry, and other fruit stones are often seen carved and highly ornamented, and made into rosaries, bracelets, etc., evidencing the patience and skill of the workman who has laboured on them. The hard stones of the date-plum and other indigenous fruits are frequently beautifully and elaborately carved by the Chinese and Japanese.

Under the name of Quandung-nuts, the corrugated seeds of the Australian native peach (*Santalum acuminatum*) are often set and mounted for scarf-pins, bracelets, and other ornaments.

The spherical corrugated seeds of *Elæocarpus ganitrus*, and other species cleared of their soft pulp, are used by the Brahmin priests as beads. They are also made into necklaces and bracelets for ladies, which are much admired, especially if gilded or capped with silver mountings. Those of *Monocera tuberculata* are used for a like purpose in Travancore. The nuts of *Putrangiva Roxburghii* (the wild olive), called in Hindostan "Jeeopatra," are strung by the natives, and put round the necks of their children as an amulet.

The seeds of the bladder-nut (*Staphylea pinnata*) are as hard as bone. The nuts, in some parts of Europe, are threaded for paternosters, and made into necklaces and chaplets. They are also called cut-noses and false pistachios. The kernel has a little of the flavour of the pistachio, but is very acrid, and occasions nausea if eaten to any extent. It yields by expression a bland oil.

MISCELLANEOUS NUTS.

Under this last group I may include those used for tanning and other purposes. Among the tanning and dyeing nuts or seeds are valonia, under which name the large acorn cups of *Quercus ægilops* are imported from Turkey. The incipient acorns are called camata and camatina. In 1859, 25,579 tons, valued at £332 527, were imported; last year 27,706 tons, valued at £441,998, were received. Under the name of myrobalans, the dried fruit of some species of *Terminalia*, chiefly *T.*

chebula, are imported, sometimes to the extent of 6000 tons in the year. In 1870, 3000 tons, valued at £33,000, were imported. One species sometimes comes in under the name of Bedda-nuts. From its astringent properties, the dried fruit is much used by the Hindoos in their arts and manufactures. The outer coat of the fruit, mixed with sulphate of iron, makes a very durable ink; hence they are called in the bazaars of India ink-nuts.

The Belleric myrobalan (*T. Bellerica*, Roxb.) is also astringent, and sometimes used in medicine in the East. The kernel of the nut mixed with honey is given in certain cases of ophthalmia. It is said to intoxicate if eaten in great quantity. An oil expressed from the seed is used in India for strengthening the hair. The kernel of the nuts of another species (*T. Catappa*, L.) has the flavour of an almond, and may be used for the same purposes. The oil is very like the almond oil of Europe, both in taste and smell, but becomes turbid by keeping. It only requires care and attention in its preparation to render it of commercial value and importance. To extract the oil, the fruit is gathered and allowed to dry in the sun for a few days, when the kernels are cleaned and bruised in a mill.

Nutgalls, the spherical concretions and excrescences formed upon the leaves and leaf-stalks of several species of oak and other trees in the south of Europe, are made by the puncture of the female gallfly. There are blue, black, green, and white galls; the last are of little value. Those from Aleppo and Mosul are the best; they are about the size of a nutmeg, and mostly of a bluish or greyish colour, hard, heavy, compact, with numerous small tubercles on their surface. The imports in 1870 were 17,748 cwt., of the value of £54,169.

Grey Bondue nuts, sometimes called Nata in India, and in Barbados the horse-nicker or chick-stone, are the stony seeds of *Guilandina Bonducella*. They are intensely bitter, and have hence some medicinal reputation. They are used for playing a game in Western Africa. Ornaments made of them are very common in museums, and I have seen baskets, bracelets, rosaries, and other articles made with them.

The kola-nut of Western and Central Africa, the seed of *Sterculia acuminata*, have attracted some attention from their use in food and medicine by the natives; and after careful analysis, Dr. Attfield found they contained 2 per cent. of theine, which is more than the average in tea and coffee.

The poison-nut, or ratsbane, the seed of *Strychnos Nux-vomica*, is contained in a pulpy fruit, about the size of an orange. As a medicinal agent these seeds possess valuable qualities, but are highly poisonous, except in very minute doses. What is done with the 5000 or 6000 cwt. imported it is difficult to say.

The seed of another species (*S. potatorum*), the clearing-nut, has more useful properties, for they are employed in India to clear muddy water. One of the seeds is well rubbed round the inside of the earthen vessel containing the water, which is then left to settle; in a short time the impurities fall to the bottom, leaving the water clear and perfectly wholesome.

The marking-nut, the fruit of *Semecarpus Anacardium*, is in general use in India for marking cloths with the juice of the pulp; the colour is improved and preserved from running by the mixture of a little quicklime and water.

Under the name of soap-nuts, the round black seed of *Sapindus Saponaria*, *S. emarginatus*, and some other species are much used for rosaries, necklaces, bracelets, and other ornaments. They derive their name of soap berries from the acrid saponaceous pulp being used for washing linen. The kernels of *S. esculentus* are eaten in the West Indies, and deemed as palatable as the hazel-nut or almond.

Horse-chestnuts are much used on the Continent for making starch, and an oil is said to be obtained from them which is sold by some chemists as a sedative in gout.

The drupe of the wild almond of the Cape (*Brabijium stellatifolium*, R. Br.), after having been soaked for some days in water, is eaten by the natives, being considered injurious when quite fresh. The kernel roasted is used as coffee.

Ravensara-nuts are the aromatic fruit of *Agathophyllum aromaticum*, used sometimes instead of nutmegs.

Sassafras nuts, another aromatic seed, are the isolated lobes of the seeds of *Nectandra Puchury*.

Cumaru nuts of Brazil and Guiana are the seeds of *Dipterix odorata*, the tonquin bean of commerce, which yields a pleasant perfume for snuff, clothes, etc. A clear yellow fixed oil is obtained from them, which is used in perfumery and for ulceration of the throat.

I have thus taken a hasty survey of nuts and their products, necessarily, from the wide field I have had to cover, very superficial; but I think those who have followed me in my investigation will admit that it is an interesting subject of inquiry, and that the commercial uses of nuts and their products are of high importance in this and other countries.

PHILADELPHIA COLLEGE OF PHARMACY.

A pharmaceutical meeting was held on May 20th; the President in the chair. On this occasion a presentation was made by the chairman, on behalf of some members, to Mr. Samuel F. Troth, it being the fiftieth anniversary of his election to membership. The gift consisted of a copy of the last edition of the United States' Dispensatory and of Dr. Thomas's Biographical Dictionary, together with a suitable inscription.

Mr. Bullock exhibited the result of drying a film of gelatine on a sheet of glass; in contracting, it was found to raise a film of the glass with it. Mr. Procter had noticed this in a test-tube with glue, though not on so extended a scale.

Prof. Maisch presented to the college a number of specimens of cundurango, sent through Dr. Ruschenberger, U.S.N., by Dr. J. M. Foltz, Surgeon-General U.S. Navy, for the college cabinet. They were collected in the province of Loja, Ecuador, by Passed Assistant-Surgeon Joseph G. Ayres, of the Navy, by official direction, and forwarded with a report to the bureau of medicine and surgery in the Navy Department; a description of the several specimens has been prepared and will probably be published. The specimens comprise pieces of stems, fruit, etc., of the following seven varieties:—Cundurango de tumbo grande, de tumbo chico (Bejuco Pachón), de Paloma, de Platano, de cascarilla, Saragosa and blanco. Prof. Procter raised the question whether cundurango was the same as guaco, which has been sold in European markets as cundurango, and whether any authentic case of cure from the use of this remedy is known. Prof. Maisch stated that he had never seen guaco sold as cundurango in our market, nor had he read of the cure of a case of cancer in any of the medical or pharmaceutical journals, and stated that none of the physicians whose names were mentioned in connection with its successful use when first introduced now claimed anything for it; some publicly declare they had nothing to do with the publication of their names as recommending it.

Mr. Remington spoke of an adulteration of iodine which recently came under his notice. Upon examination this sample was found to contain about 25 per cent. of sawdust. Mr. R. stated that the adulteration was very easily detected by close examination, or by one accustomed to handling the article. It was suggested by members that the sawdust may have become mixed with the iodine through breakage, the iodine having been packed in it for transportation. The adulterant seems almost the last that would suggest itself, on account of its lightness. The result of further investigation will be interesting to the profession at large.

Prof. Maisch exhibited a fine sample of round cardamom (*Amomum Cardamomum*), very rare in the Philadelphia market.

The Professor also exhibited crabs' eyes, which were enclosed in a small bag in an original package of cantharides. The question arose as to the cause of this; and as crabs' eyes are thought to be about as expensive as cantharides, it is doubtful whether this can be called an intentional fraud.

A curious specimen of colchicum was also shown, cut in transverse slices, externally white, internally quite dark in colour.

The Professor also exhibited to the College a fine sample of Chinese blistering fly (*Mylabris Cichorii*), said to contain one-third more cantharidin than Spanish fly of European commerce. These flies differ from the *Cantharis vesicatoria* in some particulars, and are devoid of the peculiar green lustre on the wings. Some discussion ensued as to the principle, cantharidin, and its development in the fly, as being connected with the genital organs of the female fly, and being present only at a certain stage in its life. The Chinese fly is imported into the London market at about half the price of the officinal fly.

Prof. Procter spoke of *Cantharis atrata*, which is not a Mylabris, and which he has had for some time.

This was the last meeting until the autumn.

Parliamentary and Law Proceedings.

HOUSE OF COMMONS.

Monday, June 17th, 1872.

Metric System of Weights and Measures.

Mr. J. B. Smith asked the President of the Board of Trade whether he intended to bring forward any measure to relieve persons who, acting under an Act of Parliament passed in 1864, which declared "it is expedient to legalize the use of the metric system of weights and measures," make use of the same, but who, according to the opinion of the law officers of the Crown, were liable to be prosecuted if such weights and measures were found in their possession; and whether he intended during the present session to bring in a general measure for the regulation of weights and measures.

Mr. Fortescue said the question was, to a certain extent, founded upon a misconception of the Act to which it made reference, for, while the preamble of the Act declared that it was expedient to legalize the use of the metric system of weights and measures, the enacting part only legalized contracts made under that system. The Standards Commission had, however, recommended the permissive legalization of the metric system; and he might say that any bill he might bring in would carry that suggestion into effect. He did not see any prospect of introducing the bill during the present year.

PAPERS PRESENTED TO PARLIAMENT.

Report on Certain Sizing Processes used in the Cotton Manufacture at Todmorden, and on their Influence upon Health.

In July, 1871, a memorial was presented to the Lords of Her Majesty's Council, signed by 1650 weavers of the Todmorden district, representing that the use of kaolin or China clay in the cotton manufacture has during recent years been largely adopted, and led to the use of large quantities of sizing to cause it to adhere to the warps. The petitioners believing that the practice was very injurious in consequence of the poisonous nature of the ingredients used,* and the want of ventilation in the weaving sheds, prayed that a medical inspector might be sent to inquire into the system generally. Dr. Buchanan was, therefore, instructed to visit the district and investigate this subject, and from his report, which has just been laid before Parliament, we extract the following. Premising that although his personal investigation had been confined to the district of Todmorden, he had been informed that processes similar to those there observed, more or less modified, were widely employed in cotton factories throughout Lancashire and Yorkshire, he proceeds to give some history of the origin of the practice.

"Up to twenty years ago, 'sizing' of cotton consisted in the use of some fermented flour and tallow, in order to give tenacity to the warp and to lessen friction in the weaving process. The amount of such size required for this purpose to cotton of the quality that was usual twenty years ago, averaged for ordinary cotton goods about 20 per cent of the weight of the warps. About twenty years ago, it was observed by some sizers that the brownish colour given to cotton cloths by size made from inferior kinds of flour could be reduced by the addition of a small quantity of China clay to the size; and further, that this material so far reduced the glutinous quality of the flour that the sized warps would weave easily with a less amount of tallow in the size. In 1854, at the time of the Russian War, the increased price of the usual sizing materials led to further substitution of China clay. Some manufacturers, when these facts came to their notice, would have nothing to do with the new substance, and insisted on having the desired whiteness and freedom in weaving by the use of good flour and tallow in the size. But other firms were content if they got the results they wanted in the appearance of their cloth, and could get their sizing done more cheaply by employing sizers who used China clay. This was the first stage in the use of the substance, a certain quantity of the clay entering into the composition of the size, and the number of factories becoming more numerous that used such sizing; but the total amount of size in proportion to cotton not becoming materially increased.

"This was the state of matters, when, in 1862, the American War produced the English cotton famine. Cotton then very rapidly rose in price, and the better sorts were almost unattainable. Now it appears that warps of shorter fibred cotton are difficult to weave, unless the needful tenacity of the twist be given by a larger amount of size than would be wanted for better sorts. Of size, made of flour and tallow, warps from the worse kinds of cotton are stated to require even more than 20 per cent of their weight. The product is, of course, worse in quality than cloth made from better raw material; but as poor cotton had to be employed, it was necessary to use such quantity of size as would allow it to be woven.

"But the lack of cotton in 1862 introduced another practice. Weight for length had been, as it still is, the chief test of the goodness of any description of yard-wide cloth; and with the scarcity of raw material came the practice of giving a fictitious weight to cloths containing less cotton, in order to make it appear that they contained more. It became a matter of rivalry with sizers, which of them could, on the order of manufacturers anxious to meet the demands of merchants, 'put on' most foreign matter upon the cotton warps.

"From this practice of 'heavy sizing' the more reputable manufacturers long kept aloof, but they did so at the expense of their immediate trade; and for the last three years every yard of cotton cloth made at Todmorden, and many other places, has been weighted with quantities of size, not required for any manufacturing purpose, but used as an adulteration."

Dr. Buchanan then gives some information as to the nature of the size used:—

"The 'size' that is thus put on to cotton warps is of various composition. It may still consist, in the main,

* See a case of poisoning by a baryta sizing compound reported last week, p. 1021.

of flour and tallow, some sort of salt being added either for the purpose of lessening the glutinous quality of the flour (which otherwise would, when used in quantity, stick the warps together) or else for the further purpose of retaining moisture, and thus of increasing weight. Epsom salts and chloride of magnesium (with sulphate and chloride of zinc, not yet in common use at Todmorden) have been the principal salts used for one or both of these purposes; and these substances go by the generic name of 'antiseptics,' a name which would appear to belong more properly to those of the salts which have the further property of preventing mildew in the artificially weighted cloths. This class of substances is that to which the memorialists refer as 'poisonous ingredients.'

"The salts above mentioned are not in the ordinary sense 'poisonous;' that is the small quantity of them that comes off the cotton warps in the weaving process would not, if taken into the stomach, kill a person. It is indeed asserted that more mischievous substances have for their 'antiseptic' properties been put into size. These are the terms in which a newspaper refers to certain of such: 'Size is fermented vegetable and animal matter; and when once life, vegetable or animal, has been started in it, it is rarely and with great difficulty extinguished.' And here again comes another source of mischief. The antiseptic Mr. Molesworth so mysteriously vapours about, is an addition intended, practically speaking, to keep the mixture of cotton size and clay from vegetation, and as a rule, consists of alum, arsenic, or baryta. None of these compounds are desirable elements of our daily bread or food, but their effect and quality have also been exaggerated.'

"After the best inquiries I was able to make, I have satisfied myself that this statement, so far as regards the use of arsenic and baryta, has no application to the process of sizing as practised at Todmorden. It will subsequently be seen that this opinion is supported by chemical analysis. I think it doubtful whether arsenic has anywhere been at all commonly used.

"But, although the sizing that shall give the desired amount of weight does not necessarily include China clay, yet in practice, that substance is far most commonly added in heavy sizing; for not only does it give a whiteness to the over-sized cloth, and help the weaver by 'opening the twist' (that is, lessening the cohesiveness of the warp threads that would result from the over-use of the flour-size alone), but the clay itself serves, with particular efficiency, the desired object of giving weight to the cloth. One-third of clay (33 to 37 per cent.) is the usual proportion for these purposes introduced into 'size,' the remainder of the size consisting of flour and some fatty substance, with or without one or other of the so-called 'antiseptics,' and perhaps, also, some animal glue or rosin. The composition of the size, and the proportions of its ingredients, vary in different factories and with different sizers, and the minuter processes upon which depends the ability to get the greatest amount of size upon the warps, are frequently trade secrets with particular sizers. In general terms, however, the practice of sizing at Todmorden, for the kind of cloths that are made there, consist in putting on to the warps from 50 to 90 per cent. of 'size,' one-third of which consists of China clay. The chief differences consist in the amount and nature of the fatty substances used, and in the employment or not of some or other 'antiseptic.'

"The adherence of China clay to the warp is much affected by these differences. Whatever the other ingredients of the size, some of the clay comes off in the weaving process. That quantity is smaller when the rest of the size consists of flour and fatty matters only; larger when the fatty matters are in smaller quantity, and when 'antiseptic' is used."

One subject alluded to in the memorial was the imperfect ventilation and humidity of the weaving sheds. In weaving warps of inferior cotton, weighted with China clay and flour mixed with deliquescent salts, there is especial occasion to keep the weaving sheds damp, as in this way the brittle compound of cotton, flour and clay is less liable to break, the clay comes off less, and the resulting cloth is also heavier by the weight of the retained moisture. The conditions most favourable for retaining in the air the moisture desired for facility of weaving, were at the time of the inspector's visit secured by windows and so-called "ventilators" being habitually kept closed.

With regard to another point, the diffusion of dust in the air, Dr. Buchanan reports that he visited seventeen weaving sheds on the premises of twelve manufacturers. In four sheds, belonging to two manufacturers, there was, in daylight, no perceptible haze in the atmosphere. In all the others there was more or less of haze, caused by very fine particles of dust. In all the sheds there was more or less dust on every surface where it could settle, and this though the floors and looms had been cleaned of the dust on the previous evening, or in the course of the same day. This dust was generally loose, but in one or two establishments it tended to adhere to the floor. These were places were sizing was done in the establishment, and where fatty material, but no 'antiseptic' was used. The looms were, in all cases, covered with opaque dust, varying in amount from a slight bloom, in the sheds of the just-mentioned establishments, to a thick layer in some other sheds. The quantity of dust was found to depend, in part, upon the sort of cloth that was being made. In the most dusty sheds the clothes and hair of the weavers were seen covered with fine white dust. Further, the stranger-visitor experienced, in all the more dusty sheds, and roughly in proportion to the amount of visible dust, very great irritation in the nose, and in a less degree to the eyes and throat. To this irritating effect of the dust, a frequent visitor, and still more a weaver, gets speedily accustomed; though there is a certain number, apparently a minority, of weavers who remain incommoded by it whenever their work is more than usually dusty. Of course there is no cause for satisfaction in the deadening of sensations that should be sentinels against irritating matter entering the throat and lungs.

Respecting the matters composing this dust, analyses, made for the purposes of this report by Dr. Dupré, show that there is a good deal of agreement in its general composition; the chief difference consisting in the proportions of the several substances composing it. None of the more poisonous minerals were found in any of the specimens examined. One-third to one-half consisted of clay in its ordinary sense (*i. e.* anhydrous clay, with the addition of about one-eighth its weight of moisture).

"As for the China clay, against which especially the representations of the Memorialists were directed, the statement is confidently made by manufacturers that, through its weight, the particles must fall directly downwards from the looms, and cannot reach the face-level of the workers who stand over them. This statement is little less than absurd to any one who goes, without preconceived notions, into an average Todmorden weaving shed. Wherever dust can lodge, at all levels of the shed, on the hair and caps of the workers, on the heating-pipes eight feet from the ground, everywhere the dust is of the same opaque, white kind. When the gas is lighted, the spaces between the lights are white in the weaving-sheds, while in the adjacent throstle-room the spaces between the gas jets are perfectly black. That this dust is, in effect, the China clay, quite as much as other matters, has been proved by direct experiment."

It is alleged by some of the manufacturers that men employed at the extremely dusty works in Devonshire and Cornwall, where this clay is obtained, are healthy and long-lived; to which statement Dr. Buchanan thinks it enough to oppose the high mortality from lung-diseases among potters, employed under in-door conditions, much more nearly resembling those of these cotton weavers.

"Examining the yearly death-rates of Todmorden from lung diseases and consumption together, and comparing them with the corresponding rates of England at large, there is found to have been in 1851–60 no excess of such mortality among persons of the middle period of life (the figures are 467 against 448), but some excess among persons over 55 years of age (1340 against 1190.) The Todmorden death-rates of the last few years, as compared with those of ten years ago, from lung disease and consumption, show only one important change, and that consists in a considerable increase (from a rate of 1340 to a rate of 1860) of such mortality among people over 55 years old.

"Examining the mortality registered as from lung diseases separately from that registered as consumption, there would appear to be great and growing excess of 'lung diseases' in Todmorden; while there has been a lower death-rate from 'consumption' there than in England, and this death-rate is less now than formerly. However, experience has shown that in an instance like the present, it is unsafe to draw inferences from the death returns, in regard to the prevalence of the one class of diseases apart from the other, as the appearance of disease in the death register under the one or the other class may be more a question of nomenclature than of facts.

"All the medical men in Todmorden agree that lung diseases are greatly prevalent there, and that the circumstances of employment in the cotton manufacture conduce to such diseases. There is a general agreement too that cotton-workers, with a family tendency to consumption, have that tendency developed; and that those who, without such tendency, continue to work in mills up to 40 or 50 years of age, very commonly break down with lung disease. It is also agreed that they suffer much, and more than other people from dyspepsia. But here the general agreement ends. Respecting the particular occupational circumstances that bring out consumption, or that cause lung disease and dyspepsia, there is difference of medical opinion. While some of the doctors are disposed to ascribe these diseases to sudden changes of atmospheric moisture and temperature, to want of care about clothing, and to hastily swallowed meals, others recognize the dust produced in the cotton mills as being a potent additional cause of each of these maladies. Respecting any change in prevalence of these diseases among weavers, since the practice of heavy sizing was introduced, and respecting the degree of this prevalence among weavers as compared with people employed in other branches of work, there is again difference of statement. On the whole, medical opinion inclines to there being more ill-effect on the lungs of weavers now than formerly, and to the weavers approaching now more than formerly to carders in their liability to chest complaints.

"There can be no doubt that there is a widely spread, though not a universal, belief among weavers in the injurious effects of 'China clay.' I was given the opportunity of personally conversing with twenty weavers, who thought they had been injured by the processes newly incident to the occupation of weaving, or as they put it, by the China clay. They were of various ages, and both sexes, and had had experiences of weaving of very various duration. The commonest complaint among them was shortness of breath coming on at various times after they began weaving, incapacitating them from any active exertion, and ceasing quickly in such as changed their employment for home or out-door work. Among eleven who had experienced this, four, aged respectively 53, 50, 39 and 19, had distinct emphysema of the lungs; one, aged 18, with family history of consumption, had some consolidation of the apex of one lung; and another, aged 19, had a questionable similar consolidation. Three others had suffered, or were suffering from bronchitis. Of the 20 persons, ten gave the history of prolonged subacute dyspepsia. Four had suffered under more or less permanent epistaxis.

"By the persons themselves, often with medical authority, these complaints were connected with the conditions of occupation in the weaving-sheds. Besides that, the ailments had ceased, or had been relieved by cessation of such occupation; statements, apparently trustworthy, were made by several of the weavers, that the more dusty sheds increased the intensity of symptoms, and two of them, who had had long experience of particular establishments, spoke with confidence to having begun to suffer in their chests only after the introduction of new methods of sizing. All the weavers who were questioned stated that they knew of other weavers who had suffered in some similar way to themselves. A very intelligent overlooker, who accompanied me through one of the most important establishments of the town, expressed his own belief that weaving was not so healthy a branch of the cotton manufacture as before heavy sizing was in vogue, and that fewer weavers now pass middle age without getting something the matter with their lungs."

Such then are the facts Dr. Buchanan has been able to gather, bearing on the relation between disease and the heavy sizing processes used in Todmorden. The evidence proves, he thinks, that a slow but certain injury to health results from the circumstances under which weavers work at Todmorden.

Experience tells that the diseases, set up by dusty occupations are not, as a group, rapidly fatal. During the years that their victims are only disabled (and even disablement comes but slowly), no record is kept of their prevalence. When at last they kill, perhaps after having driven the worker to some other occupation and having made his life miserable for ten or twenty years, then for the first time they get registered.

These conclusions are of quite exact application to the sizing processes in use at Todmorden. Of late years by the use of excessive quantities of 'size,' the amount of dust in the process of weaving has been enormously increased, until it has come to pass that in many mills, weaving makes more dust than carding. Accordingly, we have already an increase in the previously high death-rate from lung diseases and consumption together among residents in the town who have passed fifty-five years of age; an increase that, under these circumstances, and in view of the fact that it all appears on the registers as lung disease and not consumption, must be presumed to result essentially from an increase in those prolonged and miserable diseases that are engendered by dusty occupations. Unless, therefore, in the practice of sizing, or in other ways, important changes occur, it is to be expected that the already excessive and increased mortality will still further increase; for the dust diseases are slow in their nature, and the heavy-sizing processes that are giving rise to them have not yet had time to produce their full effect.

Action for Libel brought by a Pharmaceutical Chemist against a Surgeon.

Court of Exchequer, June 17th. (Sittings at Nisi Prius, at Westminster, before Baron Martin *and a Special Jury.)*

Booth *v.* Forsyth.

Mr. Huddleston, Q.C., and Mr. J. O. Griffits were counsel for the plaintiff; and Mr. Digby Seymour, Q.C., and Mr. Benjamin appeared for the defendant.

This was an action of slander brought by a pharmaceutical chemist at East Greenwich against a surgeon. The slander complained of, the plaintiff alleged, wa uttered in the presence of a Doctor Saundry, as they were leaving the residence of a Mr. Downs,, on the Marshes. The defendant said to the plaintiff, "I have an important case down in the Marshes where you have been supplying medicine to procure abortion. To be plain with you, the eyes of the police are upon you. I have some of the medicine, which contains a sediment, and I intend putting it under a microscope. There has been a good deal of amateur doctoring going on in East Greenwich lately. This is a serious case, and I cannot screen you." To this plaintiff said he replied, "Really, Dr. Forsyth, you must be in error. All that I know is, a female called at my shop on Tuesday, suffering from diarrhœa through taking aloes ('pilacotia'), and I gave her a bottle of mixture, and she went away. She subsequently called with her mother, a Mrs. Green, and stated that the relaxation had ceased, but she was suffering from pains in her loins and bearing down, and after referring to Dr. Lee's book on the practice of midwifery, and suspecting from the symptoms what was the matter, I prescribed for her from that work, and charged her 1*s.* 3*d.* for it, and told her, with rest, she would be better." It appeared that afterwards, meeting Dr. Forsyth in the street, the plaintiff asked him if he intended apologizing for the charge he had made against him, to which the defendant replied, "No, not I. I've got you now, and before I've done with you I'll see you leave Greenwich; you know you are not a qualified man to supply medicines, and I'll make you smart for it."

In cross-examination the plaintiff denied that the words were, "I've just come from a woman who says you have given her something to procure abortion." He admitted that he had given a Mrs. Sargeant a lotion for her legs, and that it contained prussic acid, and she had taken it instead of her medicine; and several doctors, including the defendant, were afterwards in attendance upon her. He had given a woman solution of strychnine to kill bugs, and it required water to be mixed with it before using it, but he could not undertake to say he had given written instructions as to how much water was to be mixed with it. He was sure he had told her verbally how to mix it. Upon being asked why he sold such things, he said he did so in self-defence, as other chemists did it. Upon being asked by Mr. Digby Seymour what "pilacotia" pills were, he replied, the refuse aloes of a chemist's shop which could not be used in finer pharmacy. He denied that he was aware that "pilacotia" was used by the lower order of persons to procure abortion, but he knew that if given to a woman far adadvanced in pregnancy, such pills had a tendency to bring on premature labour.

Dr. Saundry was called to corroborate the plaintiff as to the words of the slander; and a police-inspector was called to prove that the defendant was surgeon to the police force, and that he had spoken to the defendant, who, upon his advice, had gone to the police magistrate.

The defendant denied that he had made use of the words imputed to him, but stated he met the plaintiff and Dr. Saundry as they had mentioned, and upbraided the plaintiff, saying that he had been called to see a woman who was very ill, and she had told him that she having had two children, and being again in the family-way was desirous of procuring abortion, and went with two other women to buy some "pilacotia." One of them bought a pennyworth, which was divided among the three. The object not being accomplished, she purchased a pennyworth for herself, and took it, and this produced diarrhœa. She then called on the plaintiff, and told him what she had done, and he gave her a draught to stop the diarrhœa. She got better and called on the plaintiff again, and then he gave her a bottle of medicine, which she said she had taken doses of. He then looked at the bottle, and it appeared to contain a solution of aloes. He examined the woman, and believed that her state was brought on by the taking of these aloes for the purpose of procuring abortion. After this statement had been made to the defendant, he went to see Mr. Downs, and, seeing the plaintiff there, followed him afterwards and made the statement mentioned above, fully believing that the woman's statement was true. An analytical chemist was called to prove that the bottle produced contained nothing but aloes; and in an advanced stage of pregnancy, such a mixture was like to bring about premature labour.

The plaintiff was recalled, and swore that the contents of the bottle produced were never sold by him either to the woman or anybody else.

After Mr. Digby Seymour had summed up his evidence, and Mr. J. O. Griffits had replied on the whole case,

His Lordship left it to the jury to say whether, if they believed the plaintiff and Dr. Saundry, there could be any doubt that the defendant charged the plaintiff with having sold medicine to procure abortion, and, as such a thing was a crime in this country, it would be slanderous to say so; or whether they believed the defendant's statement as to what he said, and, if so, his Lordship thought it would not amount to a slander. If they found for the plaintiff, then the question would arise as to the amount of damages; and upon that they must be guided by their opinion as to whether the defendant acted fairly upon the information which he relied upon, and if he did, the damages, they might think, ought to be small; or whether the defendant was actuated in what he did, as suggested by Mr. Griffits, by the fact that his practice was more or less prejudiced by the legitimate business of chemists who were nowadays so much resorted to by the poorer classes, and if he was, then the plaintiff would be entitled to substantial damages.

The jury immediately found for the plaintiff—Damages, £50.—*Abstracted from The Times.*

Review.

Lecture Notes for Chemical Students. By E. Frankland, D.C.L., F.R.S. Vol. II. Organic Chemistry. Van Voorst. 1872.

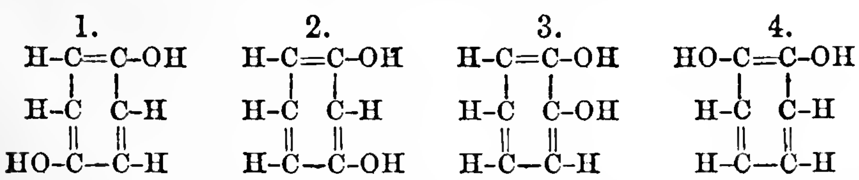
In general arrangement and in detail this new edition of Dr. Frankland's Lecture Notes is very much like the first; but valuable additions have been made relating to compounds of recent discovery, especially in the sections treating of the alcohols and acids. Under the head of Acetylene, however, we miss two reactions of great importance, viz., the conversion of that hydrocarbon into benzol by polymerization, and into hydrocyanic acid by direct combination with nitrogen.

The Aromatic compounds are treated in this edition according to Kekulé's theory; but we cannot say that the account given of them is satisfactory or well brought up to the present state of knowledge. In the first place, with reference to the hydrocarbons, it is stated (p. 42) that "the following six members of this series are known, viz.:

Pentol	C_5H_4	Xylol.	C_8H_{10}
Benzol	C_6H_6	Cumol	C_9H_{12}
Toluol	C_7H_8	Cymol	$C_{10}H_{14}$."

Now, this list is redundant at the beginning and deficient at the end. Cymol is not the highest known term of the series: for hydrocarbons have been prepared containing $C_{11}H_{16}$, $C_{12}H_{18}$ and $C_{13}H_{20}$, the first indeed in three isomeric forms, viz., $C_6H_5.C_5H_{11}$, $C_6H_3.CH_3.(C_2H_5)_2$, and $C_6H_3.(CH_3)_2.C_3H_7$; and with regard to the so-called pentol C_5H_4, we believe we are correct in saying that the most remarkable circumstance connected with it, and with the acid $C_6H_4O_2$ (benzenic acid) from which it was said to be derived, is their non-existence. If, indeed, the existence of a hydrocarbon C_5H_4 were established, and it could be shown, by its properties, to be a true homologue of benzene, then the whole theory of the aromatic bodies at present received would fall to the ground; for it would be impossible to represent such a body by any structural formula analogous to that of benzene. All this was pointed out long ago by Kekulé.*

The important subject of isomerism amongst aromatic bodies is scarcely brought out with sufficient clearness. Particular instances of isomerism are indeed given (though in the case of the hydrocarbons it has been almost overlooked), but there is no distinct indication of the two kinds of isomerism so well displayed in this group of bodies,—the one depending on the circumstance that the replacement of hydrogen by other elements or radicals may take place either in the principal or in the lateral chains; the other, on the relative position of these substituted radicals in the principal chain itself. This is well known to be a real distinction, corresponding to important differences of character in the respective isomerides. In one instance, however, Dr. Frankland has indicated a possible case of isomerism which has been overlooked by Kekulé, and indeed by every one else who has attended to the subject. Oxyphenol $C_6H_6O_2$ or $C_6H_4(OH)_2$ is known to exist in three modifications, viz. resorcin, pyrocatechin, and hydroquinone, the constitution of which is represented by the first three of the following figures, and these are commonly supposed to be the only modifications possible:—



But Dr. Frankland points out that a fourth modification is possible, namely, that represented by the fourth figure, which differs from the third in this respect, that the two groups OH are attached to carbon-atoms which are linked together by two bonds, whereas in the third figure they are attached to carbon-atoms linked by only one bond. This is certainly a difference in the formulæ; but whether corresponding derivatives exist, exhibiting any corresponding differences in their properties, is a question for future investigation. The difference, if any, would probably be but slight; for, after all, each of the carbon-atoms in question is attached, in both cases, to one of its neighbours by two bonds, and to the other by one. The point is, however, of importance: for it clearly affects many other isomeric bodies of the aromatic group besides the oxyphenols; for if this distinction is a real one, there should be four dichloro-, dibromo-, di-iodo-, and di-nitro-benzols; four xylols, four cresols, four toluidines, four acids $C_7H_6O_3$ (salicylic, etc.), four phthalic acids $C_8H_6O_4$, etc.; in short, four di-substitution derivatives in every case. It is remarkable, however, that in all the numerous cases of this kind hitherto investigated, the maximum number of isomerides actually obtained, is not four, but three.

There are one or two peculiarities of nomenclature in Dr. Frankland's work which it may not be superfluous to notice. On pages 66, 67, phenylic alcohol and its homologues are called *tertiary alcohols*, whereas in the first edition of the Lecture Notes, they were called *secondary alcohols*. Now they resemble the secondary rather than the tertiary alcohols in one respect, namely, in having the carbon-atom which is associated with the group OH, directly combined with *two* other carbon-atoms; but altogether their resemblance either to the secondary or to the tertiary alcohols of the fatty series is but slight, and it is better to designate them by a particular term, namely *phenols*, as is now generally done.

On pages 55 and 97, the nitriles are spoken of as *abnormal* cyanides. We submit that they are the *normal* cyanides, represented by the formula $C\left\{\begin{matrix}N'''\\R'\end{matrix}\right.$ and corresponding to the normal cyanic ethers $C\left\{\begin{matrix}N'''\\(OR)'\end{matrix}\right.$, discovered by Cloez, which, when treated with alkalis, are resolved into cyanic acid and the corresponding alcohols.

The graphic or constitutional formulæ in the present edition, are greatly improved in simplicity and clearness by the omission of the circles, which in the first edition were placed round the symbols of the elements; in fact, these circles, which were very much the fashion some years ago, represented nothing at all, and served only to confuse the formulæ.

We should have rejoiced also to bid farewell to the thick black **C**'s and other capitals which disfigure the formulæ without adding anything to their clearness, and to the numerous special symbols, such as Me, Et, Pr, Bu, Ay, Ph, etc., for alcohol-radicals, and Ho, Ko, Zno″, Eto, Aco, etc., for oxygenated radicals. These symbols save but little space, while their excessive multiplication is a tax on the memory, and renders the formulæ difficult to read. The perfection of a symbolic notation consists in the expression of ideas by combinations of the smallest possible number of arbitrary symbols.

* '*Lehrbuch der Organischen Chemie*,' ii. p. 519 (1866).

Obituary.

ROBERT WIGHT, M.D., F.R.S., F.L.S., etc.

Science has lost one of her best workers, and Indian Botany one of its brightest ornaments, through the death which we record. Dr. Wight died at Grazeley Lodge, Reading, on the 26th of May, aged 76.

Dr. Wight was born at Milton, Duncra Hill, East Lothian, on July 6th, 1796, and took his degree at Edinburgh, in 1816. Soon afterwards he entered the East India Company's service, serving first as Assistant Surgeon, and subsequently as full Surgeon in the 33rd Regiment of Foot. During this time, travelling from place to place, and throughout his long life in India, he devoted extraordinary talent and energy to the collection, description and illustration of Indian plants. In 1834, whilst staying in Edinburgh on furlough, he published, in conjunction with Professor Arnott, of that city, the first and only volume of 'Prodromus Floræ Peninsulæ Orientalis' (1834), a work that has been spoken of as "the most able and valuable contribution to Indian Botany which has ever appeared." Dr. Wight's return to India, however, did not allow of the completion of the work.

The success of this publication had the effect of stimulating Dr. Wight to further exertions, and, on his return to Madras, he commenced a very valuable work, entitled 'Illustrations of Indian Botany,' two volumes of which were published, containing 182 coloured plates of various Indian plants. This work was followed by a still larger one, entitled 'Icones Plantarum Indiæ Orientalis,' which consisted of valuable descriptions, illustrated with 2101 uncoloured plates. After this appeared a third illustrated work on the flora of the Neilgherries, entitled 'Spicilegium Neilgherrense.' The illustrations of all these works are very good; and one cannot but be impressed with the indomitable perseverance shown by Dr. Wight in the success and fidelity of their production at a time when lithography was in a very rude state in India.

Besides these large publications, a great number of memoirs by Dr. Wight are to be found in various botanical journals. Very many valuable medicinal and other useful plants have been figured and described by him. We need only mention as illustrations: *Tylophora asthmatica*, *Argemone mexicana*, *Calysaccion longifolium*, *Mesua ferrea*, *Vateria indica*, *Ailanthus excelsa*, *Rhus succedanea*, *Moringa pterygosperma*, etc.

Dr. Wight paid great attention, not only to the developing of Indian products, but also to the introduction of other articles, such as tea, cinchona and cotton. He was for a long time superintendent of the cotton plantations at Coimbator, and published various memoirs on the subject of cotton. Dr. Wight retired finally from India in 1853, and, since that period, has been working at the Indian Flora as much as his health would allow; and by his notes and materials largely assisting others working in the same field. Dr. Wight was married in 1838, and leaves a widow, four sons and a daughter. In presence of so much work accomplished, as shown in this slight sketch of one of the ablest Indian botanists that ever lived, and remembering the labours of Roxburgh, Griffith, Royle and others, one is tempted to use the phrase, "There were giants in those days."

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

The Preliminary Examination.

Sir,—If your correspondent, "One who has known the Drug Trade more than Forty Years," has not misunderstood the nature of my argument, he certainly is mistaken as to facts.

The youth in question ought to have been able to pass the Preliminary, but certainly was not. So far, however, from his having gone back and being less fitted for the examination than when he left school, such is very far from the case. I think your correspondent cannot fairly deduce any such inference from a careful perusal of my letter.

In one respect we both agree as to the desirability of taking no youth as apprentice who is not able to pass his Preliminary. But seeing the desirability of a thing, and making oneself a martyr to an idea, are quite two different questions. I for one do hope, however, for "the good time coming," and will do my best to help it on.

As we all ought to have the well-being of the rising generation of chemists and druggists at heart, it might be generally useful if your correspondent would inform us how many apprentices he has had who were able at the end of their time to pass the Minor examination, and the method adopted in their instruction.

One who has known the Drug Trade More than Thirty Years.

The Possibility of Effort.

Sir,—I always read Mr. Ince's communications to the Journal with pleasure, and often with profit, and I can fully appreciate the feeling of weariness with which he took up his pen for the twentieth time, to reply to an inquiring student in last week's Journal, and it may possibly scarcely become me to remind him of the many examples of love, patience, and kindness inculcated in the volume he often so felicitously quotes, and of the necessity, in teaching youth, of giving line upon line and precept upon precept.

The inquiry made of Mr. Ince by the young man is one that a great many others would like to see answered, for most assuredly in many corners of the country, a large number are in a complete fog; and excellent as Mr. Ince's reply is, I fear it conveyed but little comfort to the inquirer.

Now to every young man whose conscience is at all disturbed by the momentous question of, What shall I do to prepare myself for these examinations? I would say, Have you passed the Preliminary examination? or are you prepared to do so? If you are not so prepared, then your duty is plain and direct; and the less you let your attention be occupied by any other subject, the better.

The Preliminary examination embraces three subjects; Latin, English and arithmetic. Now it should be borne in mind that a good knowledge of these is the key that enables a student to unbar the door to all the rest that he has to learn. The more thoroughly he is master of these, the more easily he will grapple with the other subjects.

If the Preliminary has been passed, then those subjects required for the Minor and Major, viz. Chemistry, Botany, and Materia Medica, may be commenced; and an attentive student may make some progress by merely studying the elementary parts of the text-books generally made use of. (I am assuming the absence of a competent teacher.) But what he will be able to study most profitably is the Pharmacopœia and Materia Medica. It is necessary to almost know the Pharmacopœia off by heart. If one who has passed either of the examinations be within reach, he would be able to give good advice "How to do it," much better than pages of written matter.

The mistake too often made by young men is, that because they feel it impossible to grasp the knowledge necessary for the examinations in a short period of perhaps six months, that it is quite useless to make the attempt; but true knowledge is of slower growth than this, and it is only by a long contemplation of any subject that knowledge becomes imbibed. Having by reading and study got some of the leading principles of those sciences and branches of knowledge required for an examination, the student is then in a favourable condition to receive instruction from a teacher or professor, and may then make good progress, and his stay in school or college will be very much shortened, and his task made agreeable, because now he begins to see things clearly, which before he saw but dimly and darkly.

To those who live in small country towns where no lectures can be delivered, and where there is no aid at hand, I would say, do what you can during your apprenticeship by reading those elementary books used as text-books, and which can be purchased for a few shillings. Let your whole aim and object be directed during this period to this one point, of preparing for a systematic study, and submitting to an examination, and let your mind glow with the imagination of the pride and satisfaction you will feel when it is accomplished.

Shade of Paracelsus.

The Preliminary Examination.—*T. B.* has favoured us with a communication relative to the failure of so many young men to pass their examinations. He says that from the town in which he resides, containing 120,000 inhabitants and upwards, of sixty chemists and druggists, employing a large number of apprentices, etc., many have presented themselves for examination during the last twelve months, but only two or three have succeeded. The want of sufficient preparation from which this arises, he attributes partly to the long hours of business, and also to the fact that after a long day's work, employers, otherwise willing, are unfitted and unable to assist their employés in their studies. *T. B.* considers that a remedy might be found in the appropriation of portion of the Pharmaceutical Society's funds to the assistance of pharmaceutical education in the provinces. He suggests that an instructor should be nominated by the Society, in each large town, to whom students might go, upon certain payments, and that an additional sum should be given to such instructor for each of his pupils that passes an examination successfully.

W. H. also writes concerning the same subject. He is not surprised that the Board of Examiners should be dissatisfied, but he is that so many candidates should fail. He does not think the time allowed for the last Preliminary examination insufficient, or the questions unsuitable, the examination being meant for a test to prevent unsuitable persons from passing, who would be unable to succeed in future more difficult examinations. He thinks it would be a sad thing for young men to be drawn into the business by the simplicity of the Preliminary when their capabilities were altogether insufficient for the Minor. *W. H.* is of opinion that legislation to the effect that no apprenticeship to a chemist and druggist or pharmaceutical chemist, should be legal before the applicant for apprenticeship is registered as a student of the Pharmaceutical Society, would be a great boon to the student.

"A Medical Student."—(1.) We believe that Duncan's preparation is a weak solution of chloroform in spirit, made direct from alcohol and chlorinated lime. Its strength is about the same as the B. P. preparation, but it has a mild odour and flavour. (2.) In the best houses it is now customary to put in sp. chloroformi.

"A Student."—No.

Midland Counties Chemists' Association.—The Report of the Annual Meeting of this Association was received just as this number was going to press.

Communications, Letters, etc., have been received from Mr. G. Broom, Mr. J. Kirkland, "Nemo," "One who will attend," J. Johnson," "Shade of Common Sense," G. T., G. H.

SULPHYDRATE OF CHLORAL.

BY M. H. BYASSON.*

If anhydrous chloral be submitted to a current of dry sulphuretted hydrogen, at ordinary temperature, the gas is absorbed; and if the current be sufficiently rapid, there is a sensible amount of heat produced. In a short time the liquid anhydrous chloral becomes nearly solid; and in order to complete the reaction it is necessary to raise the delivery tube so as to be level with the surface. At the end of about twenty-four hours the reaction is terminated. The substance formed is completely solid, white, but presenting on its surface some portions coloured reddish-yellow. By purifying this substance, first by distillation, and afterwards by crystallization from ether or absolute alcohol, pure sulphydrate of chloral is obtained, presenting the following characters:—It is white, has a very disagreeable odour, and a peculiar taste, which recalls that of chloral hydrate. It crystallizes, by slow evaporation of its solution in ether, anhydrous alcohol and chloroform, either in rhomboidal plates or in four-sided right prisms. It melts at about 77° C., and boils at 123° C., under a pressure of 0·7385. It evaporates similarly to camphor, and its vapours will darken moistened paper impregnated with a soluble salt of lead at a great distance. It is soluble in all proportions in anhydrous alcohol, ether, and chloroform. In the presence of water it is slowly decomposed, with a deposit of sulphur, the formation of sulphuretted hydrogen, which is given off, hydrochloric acid and chloral hydrate, which are found in the water, and a small quantity of a liquid which is deposited and has the appearance of tetrachloride of carbon. It is certain that in the presence of water the reaction is very complex, because the sulphuretted hydrogen exercises its reducing action upon the compound $C_4HCl_3O_2$, †as is shown by the deposit of sulphur and the formation of hydrochloric acid and chloride of carbon.

Under the influence of the hydrated alkalies or solution of ammonia, the reaction in the cold is rapid; the liquid is coloured yellowish-brown, and chloroform is deposited. The solution contains sulphydrate of sulphide of the alkaline metal and formiate, and chloride of the same base. This reaction, analogous to that presented by chloral hydrate, and in which the formation of the chloride is secondary, may be represented by the following equation:—

$$C_4HCl_3O_2,2HS + 2\,(KO,HO) = C_2HCl_3 + C_2HKO_4 + KS,HS + 2HO.†$$

Submitted to the action of concentrated nitric acid, sulphydrate of chloral oxidizes rapidly, the disengagement of nitrous vapours is intense, and the reaction should be practised upon small quantities at a time. Sulphuric acid is found in the liquid, and trichloracetic acid, the presence of which may be easily shown in the production of chloroform by the addition of potash, and which the author has isolated by distillation. This reaction may be expressed by the following equation:—

$$C_4HCl_3O_2,2HS + 4(NO_5HO) = C_4HCl_3O_4 + 2(SO_4H) + 3NO_2 + NO_4 + 4HO$$

Concentrated sulphuric acid has no marked action in the cold; with heat there is production of anhydrous chloral, disengagement of sulphuretted hydrogen and sulphurous acid, and deposit of sulphur.

By oxidizing this substance carefully with nitric acid, adding chlorate of potash at the end of the reaction, and then estimating the sulphuric acid produced as sulphate of baryta, it was found as the mean of three analyses that 0·50 grams gave 0·635 grams of sulphate of baryta. This was thought sufficiently near to the calculated number, 0·642, to justify, when taken with the preceding reactions, the formula $C_4HCl_3O_2,2HS$. It will be seen that the formula of the sulphydrate is that of the hydrate, with the water replaced by sulphuretted hydrogen.

This compound being decomposed by water or alcohol containing water, its administration is difficult. Quantities varying from 0·20 gram to 0·60 gram, in solution in ether, were injected into guinea pigs. The effects noticed were a diminution of temperature of about one degree; muscular relaxation with peaceable slumber for about two hours; no notable diminution of sensibility, and a slight acceleration of the heart's action. After the slumber the animal returned rapidly to the normal state.

* 'Comptes Rendus,' vol. lxxiv. p. 1290.

† C=6; O=8; S=16.

STUDY.

BY W. WILLMOTT.

(*Concluded from page* 1027.)

We all know what study has done and is doing in relation to progress. Mark how swiftly we are borne over land and sea, and how ingeniously we are carried upwards through the thinner medium which surround the earth.* And then by the aid of study we find ourselves contemplating with clearness the starry universe and calculating the movements of the heavenly bodies with marvellous accuracy; whilst, on the other hand, we are seen boring through the crusts of the earth and its varied formations down to the primary granite beyond which no human ken shall ever penetrate. So that in whatever direction we proceed, there has the talisman study enthroned its power and built for all time "a local habitation and a name."

But study, like everything else, may be abused. It may be injudiciously directed on the one hand, or it may be too zealously pursued on the other. We must direct our thoughts judiciously, or we may degenerate into those egregious aberrations of intellect which invest everything with a morbid idealism. Let us by all means rise superior to this, and rely upon something higher and better for improvement and instruction.

But study may be too zealously pursued. It may be pursued to the neglect of the ordinary duties of life, or to the total overthrow of the very source from whence it flows. Sir Humphry Davy was a remarkable example of the former assumption. So zealous was his temperament, and so devoted was he to the wonders of his laboratory, that he affected not to have time enough for the necessary routine of the toilet. The consequence was he spared himself those ordinary lavations which become invested with such paramount importance in the plentiful application of soap and water; and in order, as he thought, to save time (so it is said) he was wont to

* *Vide* recent experiments.

put on his clean linen over that, whether much or little, which he happened at the time to be wearing. I believe Sir Humphry has been known to increase the amount in this way to as many as five shirts and five pairs of stockings! We are told that on the very rare occasions when he divested himself of his superfluous garments, he caused infinite perplexity to his less intimate friends, who were quite at a loss to account for his rapid transition from a state of corpulency to that of tenuity. But Sir Humphry Davy is not the only example of this kind I could mention. I am myself acquainted with a rapidly rising candidate in the field of Natural History who is so absorbed in his studies that respect for personal neatness and adornment of the most ordinary character is quite out of the question. The consequence may be better imagined than described. Men of science and others should endeavour to avoid anything like an approach to so great a mistake as this.

Again. Study may be pursued to the total disorganization of those mental phenomena which are called into play by its adoption. We deeply regret that such men as Buckland and Miller, in their earnest desire to unite Science with Faith, conjointly with the intense, though sad, conflict which the task apparently engendered, should furnish examples of this possible contingency. But so it is. Their noble, though, perhaps, mistaken efforts were past endurance; and now, far away in "that undiscovered country, from whose bourne no traveller returns," these earnest seekers after knowledge and goodness rest from their labours, and enjoy true liberty in acquaintance with that great and imperishable secret which awaits us all.

If we examine the constitution of the human mind, it will require no great perceptive ability to comprehend that a constant and excessive call upon its various faculties individually or collectively *must* tend to overthrow that due balance which is normally the sum of all its parts. Hence we are not surprised that, where imagination becomes an element of study in a highly organized capacity, the result should occasionally culminate in so sad an alternative. Stern and practical, indeed, must that man be who can look unmoved on a mind overthrown! The caution conveyed by such a possibility is too obvious to need comment.

So far, then, my remarks have partaken of a general character; but I must not overlook that special aspect of my subject which, as will be rightly supposed, comes forcibly home to my mind. The grand purpose of our lives,—we who are known as chemists, druggists, pharmaceutists, medicine-men or apothecaries, as the case may be,—is *pharmacy*. Probably no sentiment or thought calculated to urge on the student of pharmacy to the attainment of the highest point offered by his profession has been omitted in the pages of the Pharmaceutical Journal. With much eloquence and force has the subject of study been laid before the reader, and with still greater earnestness of purpose has its many advantages been dwelt upon and explained. We must so direct our thoughts that whilst we ascend to the height required, we shall detract nothing from our merits as men engaged in the daily routine of trade and commerce. The stern, practical realities of life must not be swallowed up by the grandeur of profitless and mistaken ambition. There is the counter before us, and to that counter, day by day, with steady and unwearying perseverance, must our efforts be directed. There is nothing between this and absolute failure in the hard, dry details of pharmacy.* Yet even here knowledge acquired by study will not be unavailable as auxiliary to the end in view. Time will come, no doubt, when the title indicating "the right man in the right place" will have a certain comfortable relation to the pocket which will admit of no denial. In this direction most certainly is the stream rapidly tending, and well will it be with us if we follow it closely and persistently whithersoever it goes.

I have already pointed out the possibility of disaster from too great a call upon those faculties which have for their physical basis the brain and its immediate connections; but to ourselves, as pharmaceutists, a result such as this could scarcely happen from a too earnest endeavour to gain distinction or fame. The possible mischief to us does not lie here. On the contrary, the sciences of chemistry, botany, pharmacy and materia medica, so far as the latter may with accuracy be considered sciences, are all excellent studies, and healthful and invigorating to the mind; but there is some danger lest, in the spiritless monotony of our too quiet "pharmacies," (all exceptions duly granted), the highly wrought and over-sensitive brain may stumble awkwardly against the miseries of *ennui*.† To battle with the hour during successful moments is easy; but to wrestle with Time under a heavy sense of his everlasting presence, and in the face, perhaps, of untoward circumstances, is not devoid of risk to the imaginative and thoughtful mind. Out and away, we may "kill time," so to speak, without much harm accruing; but there, "where we have garnered up our hearts," too often old Time, like the clock on the stairs, seemeth to say incessantly, "For ever!—Never! — Never! — For ever!" ‡ This possible source of mischief has not been overlooked by our ablest pharmaceutical thinker, who bravely and significantly addresses his fellow-workers as follows:—"Cultivate a cheerful frame of thought; do not scent mistakes which may never happen, nor anticipate imaginary dangers. Hope, next to knowledge,

* It is to be hoped, however, that this adherence to the counter will never render us amenable to the literary, but withal harmless, castigations of 'London Society.' "I do not know what it is," says a writer in that gorgeously conducted publication,—"the national habit of drinking beer, perhaps, or the climate, or the Metropolitan Railway, or something eminently British,—but Marshall and Snellgrove's young men, and *id genus omne*, in their hours of relaxation, are 'uncertain, coy,' and utterly devoid of *abandon*. They are stiff, wooden, impassible. They cannot shake off the shop. 'What's the next article?' is for ever trembling on their tongues, and when in repose, they turn their feet out, as though that eternal counter was still in front of them."

† Sir Benjamin Brodie, in his 'Autobiography,' speaks of "the degradation of mind which *ennui* necessarily produces."

‡ The misery that may be occasioned by a recognition of the presence of time is well set forth by the presumed happiness of the opposite condition, when "time shall be no more." "You might heap together words," says an eminent divine, "and tax the imagination to the utmost in order to delineate the glories of the New Jerusalem, with its streets of gold and its walls of precious stones, and its palaces, lit not by sun or moon; and you might outstrip all that poets have ever done in your picture of the unutterable calm of the rest of the redeemed, when congregated around the glassy sea; but in no way could you so magnify their happiness, in no way so exalt my conception of their unparalleled joy, as by telling me that they are *insensible to the lapse of time*."

is the best armour for that life's battle which we all must wage."

To conquer books with a view to examination is one thing, and by no means difficult to the determined man; but it still remains for us to learn that our victory does not end here, but that, *vincit qui se vincit*,—he conquers who conquers HIMSELF.

Much more I might have written, but here I lay down my pen, and pause. Not, however, without an increased assurance that by the right application of judicious study, we may rise to those true delights which, even in the midst of evil, are ever promised and awarded. An end like to this must sufficiently encourage, as it will surely justify, the zeal expended in its attainment. Let us, therefore, use and rightly apply the endowments we possess for the advancement of ourselves and others, ever recognizing in all things the wondrous majesty of HIM in whom must centre the attributes of mind, and to whom all thought is known from the foundation of law and order in the material world.

King's College Hospital, June, 1872.

GUN COTTON AND ITS PREPARATIONS.

BY CHARLES H. MITCHELL.*

A number of experiments were tried, with a view of ascertaining the relative proportions of cotton and acids, together with the proper time for maceration necessary to produce a cotton which should combine the largest yield with the highest explosive power and solubility. The following formula was at length adopted:—

Raw Cotton	2 parts.
Carbonate Potassa	1 ,,
Distilled Water	100 ,,

Boil for several hours, adding water to keep up the measure; then wash until free from any alkali, and dry. Then take of—

Purified Cotton	7 oz. av.
Nitrous Acid,† s.g. 1·42	4 pts.
Sulphuric Acid, ,, 1·84	4 ,,

Mix the acids in a stone jar capable of holding two gallons., and when cooled to about 80° F., immerse the cotton in small portions at a time; cover the jar and allow to stand four days in a moderately cool place (temp., 50° to 70° F). Then wash the cotton in small portions, in hot water, to remove the principal part of the acid; pack in a conical glass percolator, and pour on distilled water until the washings are not affected by sol. chloride barium; drain and dry. Yield, 11 oz. av.

This cotton is perfectly white, of a harsh, gritty fibre, very explosive, leaving scarcely any ash, soluble in ether, ether fortior, acetic ether, glacial acetic acid, and in mixture of alcohol and ether, varying from 1 part ether to 3 parts alcohol to pure ether itself. If a cotton superior to this is desired, it may be obtained by treating this cotton with an additional proportion of the mixed acids, washing and drying as before. The cotton gains about one per cent. in weight, becomes perfectly soluble, and is so free from any ash as to scarcely scorch a sheet of white paper it may be burnt on. Both this and the previous gun cotton may be ignited on gunpowder without exploding it. The advantages claimed for this cotton over that of the U. S. P. are that it is perfectly soluble, very explosive, cheap, its manufacture is much more easy, requiring but little time and attention, and turning out a superior product with large yield and less cost.

The subject of collodion next claims our attention, it being the most important pharmaceutical preparation of gun cotton. The applicability of gun cotton in ethereal solution to the dressing of wounds, inflamed surfaces, etc., was first made known by Dr. Horace Maynard, of Boston. Its valuable properties soon commanded attention, and at once supplied a want long felt in the medical profession. No better formula for collodion can be found than that of the U. S. P. Using the cotton prepared as before mentioned, it left nothing to be desired.

Collodion can also be made the vehicle for other medicines. Those remedies which are used externally, of course, can only be administered in this manner. Having made a number of experiments on this subject, I present the following formulæ, several of which I think are new:—

STYPTICS.

Styptic Collodion.

℞ Tannin	℥ ij
Stronger Alcohol	fl. ℥ iv
,, Ether	fl. ℥ xij
Soluble Cotton	ʒ j ℈ ij
Canada Balsam	ʒ j

Introduce the cotton into a suitable bottle, pour on it 2 fluid ounces of alcohol, shake well; then add 10 fluid ounces of the ether, and agitate frequently until dissolved. Dissolve the tannic acid in a mixture of the remainder of the alcohol and ether, mix with the first liquid, add the balsam, allow to stand until clear; then pour off.

Collodion with Sesquichloride of Iron.

℞ Sesquichloride of Iron . . .	℥ j grs. iv
Stronger Alcohol	fl. ℥ iv
,, Ether	fl. ℥ xij
Soluble Cotton	ʒ j grs. iv

Into a suitable bottle introduce the cotton, pour on 2 fluid ounces of the alcohol, and shake well; then add the ether, and agitate frequently until dissolved. Dissolve the sesquichloride of iron in the balance of the alcohol; mix with the prepared collodion.

ANODYNES.

Collodion with Aconite.

℞ Powdered Aconite Root . . .	℥ ij
Ether	fl. ℥ vj
Soluble Cotton	ʒ j grs. iv
Stronger Alcohol	q. s.

Mix the ether with 2 fluid ounces of alcohol, moisten the aconite with one fluid ounce of this, pack in a percolator and percolate with the balance, pouring on sufficient alcohol to recover 8 fluid ounces, in which disolve the cotton.

Collodion with Belladonna.

℞ Powdered Belladonna Root . .	℥ ij
Ether	fl. ℥ vj
Alcohol	q. s.
Gun Cotton	ʒ j grs. iv.

Mix the ether with 2 fluid ounces of alcohol, moisten the belladonna with 1 fluid ounce of this, pack in a percolator and percolate with the balance, pouring on sufficient alcohol to recover 8 fluid ounces, in which dissolve the cotton.

* From an Inaugural Essay by the Author.

† Nitric, saturated with nitrous acid.—*Ed. Amer. Journ. of Pharm.*

Antiseptics and Disinfectants.

Collodion with Carbolic Acid.

℞	Carbolic Acid	ʒj
	Ether	fl.℥vj
	Stronger Alcohol	fl.℥ij
	Gun Cotton	ʒj grs. iv.

Dissolve the gun cotton in the ether and alcohol mixed, and then add the carbolic acid.

Collodion with Sulphocarbolate of Zinc.

℞	Sulphocarbolate of Zinc . . .	ʒj
	Ether	fl.℥vj
	Stronger Alcohol	fl.℥ij
	Gun Cotton	ʒj grs. iv.

Introduce the cotton into a suitable bottle, add 1 fluid ounce alcohol, shake well; add the ether, and agitate frequently until dissolved. Dissolve the zinc salt in the balance of the alcohol, and mix with the prepared collodion.

Collodion with Thymol.

℞	Thymol	ʒj
	Ether	fl.℥vi
	Stronger Alcohol	fl.℥ij
	Gun Cotton	ʒj grs. iv.

Dissolve the cotton in a mixture of ether with part of the alcohol, dissolve the thymol in the balance of the alcohol, and mix.

Stimulants in Cutaneous Diseases.

Collodion with Iodide of Mercury.

℞	Mercuric Iodide	ʒj
	Potassium Iodide	ʒss
	Alcohol	fl.℥iv
	Ether	fl.℥iv
	Gun Cotton	ʒj grs. iv.

Triturate the iodides together in a mortar, add the alcohol boiling, and rub until they are completely dissolved. Then add the gun cotton, lastly the ether, and agitate frequently until the cotton is all dissolved.

Stimulants and Rubefacients.

Collodion with Arnica.

℞	Powdered Arnica	℥iv
	Ether	fl.℥xij
	Stronger Alcohol	q. s.
	Gun Cotton	ʒij grs. viij.

Mix the ether with 4 fluid ounces alcohol. Moisten the arnica with sufficient of this, pack in a percolator and pour on the balance, following with alcohol until 16 fluid ounces of tincture have been recovered; to this add the cotton, and agitate frequently until dissolved.

Collodion with Capsicum.

℞	Ground Capsicum	℥iv
	Ether	fl.℥xij
	Stronger Alcohol	q. s.
	Gun Cotton	100 grs.

Proceed as in collodion with arnica, recovering 16 fluid ounces of tincture, in which dissolve the gun cotton.

Collodion with Mezereon.

℞	Ground Mezereon	℥iv
	Ether	fl.℥xij
	Alcohol	q. s.
	Gun Cotton	128 grs.

Mix the ether with 4 fluid ounces of strong alcohol, and in this allow the mezereon to macerate one week. Drain, pack tightly in a conical percolator, pour on the separated liquid, and follow with enough alcohol to recover 16 fluid ounces of tincture, in which dissolve the cotton.

Collodion with Savin.

℞	Powdered Savin Leaves . . .	℥iv
	Ether	fl.℥xij
	Alcohol	q. s.
	Gun Cotton	grs. 128.

Proceed in same manner as collodion with capsicum.

Collodion with Black Pepper.

R.	Ground Black Pepper . . .	℥iv
	Ether	fl ℥xij
	Alcohol	q. s
	Gun Cotton	128 grs

Proceed in the same manner as in collodion with capsicum.

Vesicants.

Collodion with Cantharides.

R.	Powdered Cantharides . . .	℥iv
	Ether	fl ℥xij
	Stronger Alcohol	q. s
	Gun Cotton	80 grs

Moisten the cantharides with a small portion of the ether, and pack in a conical percolator. Then pour on the balance of the ether, mixed with 4 fluid-ounces alcohol, and follow with enough alcohol to recover 16 fluid ounces, in which dissolve the gun cotton.

These collodions can be used as substitutes for many of the officinal plasters, having the advantage of occupying a small bulk, ready adaptability to any surface, and powerful therapeutic action.

I have endeavoured, as far as possible, to give some practical information on a branch of pharmacy of which comparatively little is known. The subject is, I think, an important one, since gun cotton and collodion occupy a high position in both medicine and the useful arts, and to its elaboration and useful application too much study cannot be devoted.—*Amer. Journ. Pharmacy.*

Chapters for Students.

CHEMICAL NOTES TO THE PHARMACOPŒIA.

BY WILLIAM A. TILDEN, D.SC. LOND.

DEMONSTRATOR OF PRACTICAL CHEMISTRY TO THE PHARMACEUTICAL SOCIETY.

Zinci Valerianas.—$Zn(C_5H_9O_2)_2$. Sulphate of zinc and valerianate of soda are dissolved separately in hot water, the solutions mixed, and the crystals, which are deposited almost immediately, removed by straining. A few more are obtained by evaporating the liquid. The whole of the crystalline deposit is then washed and dried without heat.

$$2NaC_5H_9O_2 + ZnSO_4 = Zn(C_5H_9O_2)_2 + Na_2SO_4$$

[§ In brilliant white pearly tabular crystals with a feeble odour of valerianic acid and a metallic taste; scarcely soluble in cold water or in ether, soluble in hot water and alcohol. Its solution in hot water is not precipitated by chloride of barium. It gives when heated with diluted sulphuric acid a distillate which, when mixed with solution of acetate of copper, does not immediately affect the transparency of the fluid, but forms after a little time oily drops, which gradually pass into a bluish-white crystalline deposit.] It may be remarked that it is more than usually difficult to remove from valerianate of zinc the whole of the sulphate; and all commercial samples give a precipitate with chloride of barium. With regard to the last test, it is intended to detect admixture of butyrate of zinc, a sophistication which at one time was not uncommon.

ZINCUM.

[§ Zinc of Commerce.]

The principal ores of zinc are blende, ZnS, calamine $ZnCO_3$, and the red oxide. To obtain zinc the ore is first roasted, by which, in any case, it is converted into the oxide, and it is then heated with coke or charcoal in earthen or iron retorts of peculiar shape. The zinc distils over and condenses in the liquid form. Commercial zinc contains lead, iron, and generally traces of cadmium and arsenic. To obtain it free from impurity, the carbonate may first be prepared and this, after conversion into oxide, distilled with pure charcoal.

Zinc for chemical purposes is generally granulated by melting it and pouring in a thin stream into a quantity of cold water.

Ordinary zinc is somewhat brittle at common temperatures, but becomes malleable, and may be rolled into sheets when heated to 250°–300° F. When the temperature is further raised to a little over 400°, it becomes so brittle that it may be rubbed to powder. Although ordinary zinc dissolves in dilute acids very readily, this is not the case with the pure metal. The particles of lead which are imbedded in common zinc, form with the zinc in presence of the acid a voltaic combination in which the zinc acts the part of the positive metal, and the lead the negative. To make pure zinc or tin dissolve readily in acids, it is best to place in contact with it a piece of platinum foil; the same kind of electrical polarization is then set up, and this very greatly assists the chemical action.

MATERIA MEDICA NOTES.

BY JAMES COLLINS, F.B.S.E.

Curator of the Pharmaceutical Society's Museum.

GUM EUPHORBIUM.—Dr. E. Cosson, in an interesting note on *Euphorbia resinifera*, Berg, read before the Royal Botanical Society of Belgium, verifies the statement of Berg, that the Gum Euphorbium of commerce belongs to the species to which Berg gave the name of *E. resinifera*. Dr. Cosson found in Von Martius' collection at Brussels, a specimen of Gum Euphorbium with sufficient of the dried stems of the plant producing it to give a good idea of the plant. Probably Von Martius received these specimens from his brother, Dr. T. W. C. Martius.

The history of this acrid gum is very interesting. *E. canariensis*, L., *E. officinarum*, L., *E. antiquorum*, L., and *E. tetragona*, Haw., have each been accredited with its production; but Dr. Pereira, who examined the question with his usual critical ability, stated that only *E. canariensis* fulfilled all the requisite conditions of locality, etc.; and that he felt little hesitation in ascribing the gum to this plant. He says (Elements Mat. Med. vol. ii. pt. 1. p. 399, 1855) that the specific characters "apply to the branches found mixed with the Euphorbium of commerce. They agree with the description and figure of *Tithymalus aizoides lactifluus*, the *Euphorbia canariensis* of Plunkenet." Miller also (Gard. Dict. vol. i. art. Euphorbium) states that in looking over some Euphorbium in a shop, he "found several spines amongst it, which exactly agreed with those of that plant." Pereira found in some specimens of the gum, spines resembling those of *E. tetragona*, Haw.

But better materials led Berg to trace its origin to a new species, to which he gave the name of *E. resinifera*, and described from dried remains picked out of the gum. *E. resinifera* has a stem one-third the size of that of *E. canariensis*, and stalked umbels, whilst *E. canariensis* has almost sessile flowers. Berg gives figures in 'Berg und Schmidt, Darstellung und Beschreibung sämmtlicher in der Pharmacopœia Borussica.' The gum contains 20 per cent. of an acrid principle Euphorbin ($C_{26}H_{22}O_2$), so acrid indeed that in the collection of the gum the fingers become excoriated if brought into contact with it, and it is the practice to cover the mouth and nostrils to avoid the excessive sneezing which would otherwise ensue. The best general account of the production of this gum is that of Jackson, in his 'Account of Morocco.'

Dr. Cosson has also compared the various materials he has with a growing plant at Kew (which has not yet flowered), sent by Mr. F. Cartensen, the English Consul at Mogadore. If the history of this plant can be satisfactorily attested as being the species actually producing the gum, its flowering will be looked to with some degree of interest, as the question can then be set completely at rest.

CINCHONA ROSULENTA.—Mr. Howard has recently cleared up another doubtful point in the cinchona question. He has described and figured in the 'Bulletin de la Société Botanique de France' a new species, named *Cinchona rosulenta*, a native of Ocana, in New Granada. The vernacular name appended to the specimens of this plant, which were collected by Purdie in October, 1845, is "Quina de la tierra fria." *C. rosulenta* is very close, both in appearance and chemical composition, to *C. succirubra;* the bark, however, has a more roseate hue, and the leaves approach *C. ovata*, the nerves, however, being more rigid and prominent. Mr. Howard identifies this species with the *Quinquina rosé* d'Ocana, of M. Delondre, a figure of which is given in that author's 'Quinologie;' also with M. Rampon's *Quinquina à quinidine*, described in Dr. Planchon's 'Des Quinquinas;' and also with Dr. Wittstein's '*Peseudo regia.*'

This bark has long been known in French commerce under the name of "Quina rosé," and we are grateful to Mr. Howard for thus clearly settling its synonymy, and giving it a botanical position.—*Journal of Botany.*

PURIFICATION OF WATER CONTAINING ORGANIC IMPURITIES.

BY PROF. G. DRAGENDORFF (Dorpat, Russia).

Years ago, as is well known, Scherer proposed for the purification of water, especially when it contained large quantities of organic substances, the use of a solution of a ferric salt, especially of the sulphate.

Lately, Gunning made a similar proposition, recommending ferric chloride for this purpose. The object is plainly the precipitation from the ferric salt of the ferric oxide, which carries with it organic compounds, as for instance the deposits of many mineral springs which separate from the water all, or almost all, organic impurities. There the action is mainly one of surface attraction of the hydrated oxide in solution, which is greater with the increased volume of the precipitate.

This attraction first acts only upon the substances in solution, but extends to a large portion of the suspended substances, vibriones, amœbæ, etc. The precipitate acts upon them like the coagulation of albumen in solution, which at the moment of coagulation envelopes suspended particles, that render the liquid turbid. That the freed acid at the same time changes ammonia, its carbonate, and similar substances present in such water, into less volatile compounds, removing thus ammonia compounds in case of distillation from the distillate, is a matter of course. But even the acid may in part remain free, and especially, if carbonates do not abound, be injurious. At least, if the liquid becomes concentrated during subsequent distillation, other acids, like muriatic, would be set free, thus contaminating the distillate. I think that on the whole it would be preferable to employ for the above purpose an iron compound completely free from acid. Such a one we find in the liquor ferri dialysati, the preparation of which I have mentioned in the previous article. There I remarked that the liquor cannot come in contact with well-water without decomposition. I now add, that the decomposition upon such contact with well-water furnishes hydrated ferric oxide, which is very voluminous, and therefore may be supposed extremely applicable to the precipitation of organic admixtures.

Indeed, experiments made with very turbid swamp-water showed me that liquor ferri dialysati precipitated the suspended organic impurities, the water becoming clear. Even a portion of the organic substances in solution I was able to introduce into the precipitate; but I became convinced that for the complete separation of the latter, so large a quantity of the liquor is requisite as to render its practical application impossible. The following examples may serve as illustrations:—

Experiment 1. 200 c. c. of the above water, heated to 70°-80° and mixed with 5 c. c. diluted sulphuric acid (1 : 13), used up 6·2 c. c. of a solution of potassic permanganate, of which 6·0 c. c. were required to decompose 10 c. c. of a solution of oxalic acid, containing 0·398 grms. to the litre, to the extent of producing a reddish colouration, lasting about two minutes.

Experiment 2. 300 c. c. of the same water were mixed with 2 c. c. of liq. ferri dialysati, containing 1·5 per cent. hydrated ferric oxide, submitted to rest in a closed vessel for two days, when 200 c. c. of the clear supernatant liquid were withdrawn with a pipette, titrated with permanganate, of which 5·6 c. c. were used.

Experiment 3. A mixture of 300 c. c. of the same water with 3 c. c. liq. ferri dialysati: 200 c. c. of the clear supernatant liquor used up 4·2 c. c. of permanganate.

Experiment 4. A mixture of 300 c. c. of the same water with 4·5 c. c. liq. ferri dialysati: 200 c. c. of the clear supernatant liquor used 3·8 c. c. of permanganate.

The used of ferric chloride and sulphate also furnished no more favourable result, for even then part of the original organic substances in solution escaped precipitation.—*The Chicago Pharmacist.*

SOME CONSTITUENTS OF ERICACEOUS PLANTS.*

BY JEFFERSON OXLEY.

Of this order, *Uva ursi* and *Chimaphila umbellata* have, upon examination, been found to contain arbutin, urson and ericolin. Thinking it of some interest to know if these principles are alike common to other plants of the same order, *Gaultheria procumbens* and *Epigæa repens* were submitted to examination.

From two pounds of *Gaultheria*, as usually found in market, after removing the larger stems, the remaining leaves and smaller stems weighed one pound and six ounces, showing a loss of 31 per cent. Garbling one pound and a half of *Epigæa repens* in the same manner, one pound of leaves and small stems remained, indicating a loss of 33 per cent.

Reduced to a convenient powder they were digested with water during several hours, strained and expressed, and a second time submitted to like treatment. Upon drying the residue, the *Gaultheria* weighed twelve ounces, a loss of 45 per cent. *Epigæa repens* weighed ten and a half ounces, a loss of about 34 per cent.

The infusions were treated with neutral acetate of lead, the filtrates with subacetate of lead, and filtered. The resulting solutions were almost free from colour, being a light yellow. The lead was removed with sulphuretted hydrogen, the solutions filtered and heated to remove excess of hydrosulphuric acid. After concentrating and treating with ammonia to neutralize the acetic acid present, then with animal charcoal, and washing with cold water, the filtrates were reduced by heat, and set aside to evaporate spontaneously. After several days, crystals not appearing, a portion was separated and treated with alcohol, leaving a large per cent. of insoluble extractive matter. The alcoholic solutions were allowed to evaporate to a syrupy consistency, but without the formation of crystals.

At this point the extract of *Epigæa repens* was of a deep reddish-brown colour, very much resembling liquorice in odour and taste. On adding sulphuric acid to a dilute solution of this extract, no precipitate was produced indicating the absence of glycyrrhizin

The extracts were dissolved in water, treated with animal charcoal, washed, and the filtrates set aside to evaporate, but failed to yield crystals. The charcoal used in the latter case was digested with alcohol. The alcoholic solutions in each case had a slight colour; that from *Epigæa repens* light yellowish-brown, from *Gaultheria* light green. Upon evaporation these solutions yielded a small crop of crystals.

The evaporation was continued for several days, with the hope of a large yield; upon examination the crystalline structure was found in a great measure lost. The yield was too small to apply the various tests for arbutin. Jungmann's test* was applied. A dilute aqueous solution rendered alkaline with ammonia, produced, on the addition of phosphomolybdic acid, a blue colour.

A portion of the reserved aqueous extract was submitted to like treatment, producing the blue reaction due to arbutin; the formation of crystals and the reaction with phosphomolybdic acid warrant the conclusion that arbutin is present in each of the plants under consideration. However, it seems present in a much smaller proportion than in *Uva ursi* or *Chimaphila umbellata*, and separated with much more difficulty.

The above extracts were dissolved in a dilute solution of sulphuric acid and distilled, the distillates possessing a peculiar and rather agreeable odour, indicating the presence of a volatile principle liberated by the action of the acid. The distillates possessed an acid reaction, due, no doubt, to the acetic acid present in the lead salt used in the early part of the process. Neutralized with bicarbonate of soda and redistilled, the odour remained intact, and the distillates possessed a slight acid reaction. Neutralizing the residue with nitric acid, treating with sesqui salts of iron, produced in each a red colour, which was removed upon the addition of a strong acid. Nitrate of silver and protonitrate of mercury gave precipitates which, by heat, liberated the metals in the case of *Epigæa repens*, but not so in that of *Gaultheria*. With a mixture of alcohol and sulphuric acid added, each gave an odour characteristic of acetic ether, indicating acetic acid. The reaction with the solution from *Epigæa repens* indicated the probable presence of formic acid.

An infusion of *Uva ursi* was also distilled in the presence of sulphuric acid. The odour of the distillate was found, on comparison, to be quite similar to those referred to, that from *Gaultheria* varying somewhat, perhaps owing to the volatile oil.

A portion of the dried leaves remaining from the infusions was treated by percolation with alcohol; the resulting tinctures were of a deep green colour, that from *Gaultheria* possessing a beautiful emerald hue. Allowing the tinctures to evaporate spontaneously, the residue was put upon a filter and washed with alcohol to remove the chlorophyll: that from *Epigæa repens* parted with this colouring matter more readily than *Gaultheria*; urson was not obtained in a pure state, but sufficiently so to be sublimed in a test tube. The action of reagents

* From an Inaugural Essay by the Author.

* 'American Journal of Pharmacy,' 1871, p. 207.

could not be brought to bear upon the principles isolated, owing to the presence of chlorophyll, but as far as examined they agree with urson.

A portion of the precipitates obtained by treating the infusions with acetate of lead was freed from lead. The presence of tannin in the solution was indicated by the production of precipitates with solutions of gelatine, salts of iron (black), tin, mercury, copper, silver (a liberation of the metal by heat), and by the deep red colour with alkalies. After freeing the solution from tannin by gelatine, several reagents indicated the presence of gallic acid. After evaporating a portion of the solution with some sand to dryness, and subliming in Mohr's benzoic acid apparatus, pyrogallic acid was not obtained; therefore gallic acid is not present, but a principle having similar reactions. Trommer's test gave reactions indicating grape sugar.

A concentrated infusion of the leaves was precipitated by alcohol, and the dried precipitate was found to contain gum.

The stems and the leaves of *Gaultheria* and *Epigæa*, when distilled with water, did not yield chimaphilin, discovered by Mr. Samuel Fairbank. In the distillate from the stems of *Chimaphila umbellata* orange red crystals of chimaphilin were obtained, and the yellow aqueous distillate yielded more of the same crystals when agitated with ether.

Among the organic constituents of *Gaultheria* and *Epigæa* have been found, by this examination, arbutin, urson, ericolin, tannic acid, and a principle analogous to gallic acid, formic acid (in *Epigæa*), grape sugar, gum and colouring matter.—*American Journal of Pharmacy.*

THE MANUFACTURE OF ATTAR OF ROSES IN TURKEY.

The art of extracting the odoriferous liquids from the rose,—the favourite flower of all civilized nations,—is very old. The ancient Greeks and Romans, the Egyptians and the Hindoos, were acquainted with rose-waters, but the oil of roses, that most precious part of the blossom of the flower, which alone gives the delicious flavour, and which is to be found only in extremely smallest quantities in the leaf cells of the blossom, was unknown to the Greeks and Romans. The preparation of it was the invention of the old Hindoos, and even at the present time a great quantity of the oil is produced in India. Ghazimpoor on the Ganges is now the most important place where this dear and precious ethereal oil is manufactured. But rose-waters are produced in other parts of the world in as great quantities as there. The Indian oils and rose-waters are consumed in that country, where these perfumes are in as much favour and used as extensively as the Eau de Cologne with us. It is most remarkable that, of the large quantity of rose-oil which England consumes, none of it comes from India. The produce of the "Shiraz plain" in Persia is also very insignificantly represented in the European market. It has been noticed that Persian rose-water is not exported for the European trade, and that rose-oil is not produced there but imported from India. The famous rose districts of "Medinet Fayum," south-west from Cairo, are only of advantage to Egypt; and the once important rose-oil produce of Srinagars is in decay.

The rose-oil which Europe consumes at present comes almost exclusively from the southern slopes of the Balkan, where, in some one hundred and fifty places, the ingathering of the rose blossoms and the manufacturing of the rose-oil takes place. The quantity of oil which is produced in the south of France is very unimportant as compared with the quantity of the Turkish produce.

The most important Turkish districts where this valuable article is produced are Tchirpan, Philippopolis, Carlova, Yeni-zaghra, and Kizanlik: this last is the most important of all. The produce of this place alone amounted in 1857 to 199,000 midkals or metticals (1 mettical equal to 4·79 grams). Now the quantity is estimated at 500,000 metticals.

Professor Dr. Hochsteller, from the Vienna University, in his most interesting reports to the Geographical Society at Vienna, of his travels through Roumelia in the summer of 1869, has given very important data of the produce of oil at Kizanlik which he gathered chiefly from Mr. Julius Kasselmann, settled there. These data may serve to remove many incorrect statements published on the subject.

The roses planted in the basin of Kizanlik have light red blossoms. They are planted in rows like the vine. Sometimes roses and vines are planted intermingled on the same plot. The most important species of roses planted there are *Rosa damascena*, *R. sempervirens*, and *R. moschata;* the first of these is also planted in the south of France; the last mentioned, which has a slight musk flavour, gives the chief material of the produce of the Indian rose-oil.

The roses are gathered in their blossom state during the month of May, and are subjected to distillation together with their green calyx leaves. The still consists of a tinned copper boiler from which a pipe runs into the cooling tub. In every boiler are placed 50 okes* of water and 10 to 20 okes of roses, and the heating takes place over an open fire. The mass is boiled for two hours, the first part of the distilled fluid is put again into the boiler; the fluid, then condensed, is gathered into bottles with broad bottoms and strait necks. Water and oil distil over at the same time, the latter of course floating on the surface.

When there is a layer of oil of the thickness of a finger, it is removed. This is done by a funnel-shaped spoon with a very thin opening at the top which permits a passage to the water but not to the oil. 5000 lb. (German weight) of roses gives by careful distilling 1 lb. of oil.

The so-called freezing degree, that is, the degree of temperature when the separation of the solid parts takes place, varies with the oils of Kizanlik between 8 to 16 degrees Réaumur, equal to 50 to 68 degrees Fahrenheit. The best oils get solid or stiff at these temperatures; they come from the colder mountain districts, whereas the oils from the warmer localities get solid at 12 to 16 degrees Réaumur equal to 59 to 68 degrees Fahrenheit. These oils, marked strong oils, have a less delicate flavour, and are preferred by ignorant traders.

It is evident that such a valuable substance as the rose-oil is very much exposed to adulteration. The adulteration takes place most extensively at the home of the oil, where also the substance for adulteration is produced on a large scale. This article, also an ethereal substance, is called in India "rosia-oil," in Egypt "idris-oil," and in England "ginger-oil." It is distilled from species of *Andropogon* and *Cymbopogon*.† The idris-oil is sometimes called "geranium-oil." Among the data furnished by Mr. Kasselmann is one that the distillers often adulterate the rose-oil with geranium-oil which is imported from Alexandria. This is but idris-oil exported from Bombay.

The rose-oil is exported in round tinned copper bottles called "kunkoumas," which, when filled, are closed by soldering. The price on the spot per German pound is 120 to 125 thalers.

To the above particulars, which are translated from the Vienna *Neue Freie Presse*, Mr. Blunt, Her Majesty's Vice-Consul at Adrianople, in a recent report,‡ adds some further information as to the manufacture of attar of rose in that district. He says that since his last re-

* Oke = 1200 grams.

† *Cymbopogon* is synonymous with the genus *Anatherum;* the latter is the name used. Both *Anatherum* and Andropogon belong to the Order *Gramminaceæ* (section *Andropogoneæ*).

‡ Reports from Her Majesty's Consuls, No. 1 (1872), p. 266.

port in 1866 the cultivation of the rose plant and the manufacture of attar have been vigorously carried on by the inhabitants, principally Bulgarian and Turkish peasantry, but only with partial success as regards the quantity yielded; for during the last five years (1867–71) the average yield of the crop each year has not exceeded 400,000 midkals or about 600,000 drachms, whereas the yield of an average crop should be about 825,000 drachms.

This falling off in quantity Mr. Blunt considers not to be the result of a decline in the cultivation of the rose, for he has been assured by producers that the area of plantations has been annually enlarged and improved in Kizanlik and elsewhere. It is mainly attributed to atmospheric influences: one year the flowering season was retarded by sudden frosts; in another the crop was reduced by blight and caterpillars, and so on.

The crop for the year 1871 looked very promising indeed in March, but a sudden frost in the budding season in April, and hot and dry weather in May, very considerably reduced its yield, and deteriorated the quality of the oil extracted.

It is estimated that the total quantity of oil distilled in 1871 amounts to barely 360,000 midkals, equal to 540,000 drachms. Of this, 305,000 midkals or 457,500 drachms had at the time of the report (October, 1871) already been exported, principally to the United Kingdom, United States of America, France and Germany. The stock in hand for exportation was about 120,000 drachms, including 37,000 drachms from the crop of 1870.

The average price of attar in 1871, free on board at Gallipoli, including 1 per cent. customs duty, was quoted at 15 piastres per midkal, equal to about 2*s.* 9*d.* per $1\frac{1}{2}$ drachm, the pound sterling equalling 110 piastres.

The following table gives the average cost of Adrianople attar, free on board, in 1867–70:—

FREE ON BOARD AT GALLIPOLI.

Year.	Cost in Turkish Money, and per Turkish Measure. Per Midkal. Piastres.	Cost in English Money, and per English Measure. Per $1\frac{1}{2}$ dram. *s.* *d.*	Including Rate of Customs Duty levied, *ad valorem.* Per cent.
1867	20	3 $7\frac{1}{2}$	5
1868	16	2 11	4
1869	$17\frac{1}{2}$	3 2	3
1870	16	2 11	2

A sketch of the apparatus used in the process of manufacturing the attar, drawn by a Turkish engineer of the vilaet, and kindly furnished by his Excellency Atta Bey, ex-Governor of the province of Philippopolis, accompanies Mr. Blunt's report.

With reference to the amount of the several taxes which Government levy on the manufacture and exportation of attar, Vice-Consul Blunt says that besides the tenth part of the produce, or its money value, which Government annually levy, an internal duty of 8 per cent. *ad valorem* is also levied on what is sold for home consumption.

The Customs duty on attar, which is exported to foreign countries, is 1 per cent. *ad valorem.*

Thus Government take 11 per cent., including tithe, on attar which is exported, and 18 per cent., also including tithe, on what is consumed in the country.

A merchant wishing to export attar, on which the tithe has already been levied, generally has to deposit with the authorities at Kizanlik the internal duty of 8 per cent. on the quantity to be exported: this is repaid to him on his producing, within sixty days, to count from the date of the deposit, a declaration of the Custom-house at the port of exportation specifying the quantity of Turkish attar he cleared and shipped. If this declaration, called "Ilmi-haber," is not produced within the sixty days, the deposited duty is forfeited, as the attar is then looked upon as being for internal consumption.

DISINFECTANTS.

A commission appointed by the French Academy to investigate the relative merits of various disinfectants for use in hospitals where contagious diseases are treated, have made the following report as the result of their experiments:—

Hyponitrous Acid.—The members of the commission agree that the first place among agents for attacking and destroying infectious germs must be accorded to *hyponitrous* acid. Extraordinary precautions must, of course, be observed in making use of this dangerous gas; the doors and windows must be carefully sealed with gummed paper when disinfecting a room containing forty or fifty cubic yards. The materials are taken in the following proportions:—Two quarts of water, three and a quarter pounds of ordinary commercial nitric acid, and half a pound of copper turnings or filings. A stoneware vessel is employed, holding two or three gallons. The exit doors are carefully pasted up, and the room left closed for forty-eight hours. The person opening the room at the expiration of the time should be protected in some way from breathing the gas, by a suitable respirator.

Carbolic Acid.—This is cheaper, more easily used, less dangerous, and has proved equally efficacious. It is best employed mixed with sand or sawdust—one pound of acid to three pounds of an indifferent substance. The mixture, placed in earthen vessels, was used for the same purpose as the hyponitrous acid. Carbolic acid, diluted with fifteen or twenty parts by weight of water, was found useful for daily sprinkling of the floor and bedclothes.

An interesting case is mentioned in the report where neither chlorine nor hypochlorous acid was able to destroy or render odourless the gases given off from the corpses in the Paris Morgue during the heat of summer. The object was attained by dissolving a quart of liquid carbolic acid in 500 gallons of fresh water, contained in the reservoir and used to sprinkle the bodies. Putrefaction was entirely stopped.

Devergie found that water containing only one to four thousandth part of its weight of carbolic acid sufficed to disinfect a dead house, even in the hottest weather, when six to eight corpses were in it.

For fumigating linen, mattresses and other bedding with chlorine, Regnault's latest method was used, namely, one pound of chlorinated lime (bleaching powder) is sewn up in a strong bag of sail cloth, holding about a quart, and put in an earthen pot containing a quart of common muriatic acid (sp. gr. 1·15) and three quarts of water. As soon as the acid comes in contact with the chloride of lime the room is closed, and the things exposed to the action of chlorine gas for twenty-four hours; the room is then aired for forty-eight hours. Ten such earthen pots give off 500 litres of chlorine, sufficient to disinfect from twenty to twenty-five, more or less, dirty mattresses.—*Scientific American.*

A NOVEL METHOD OF COPYING MANUSCRIPTS AND DESIGNS.

A very beautiful application of science has recently been made for readily copying writings and designs, which we doubt not will receive extensive application by men of business. The invention has been elaborated by an Italian gentleman, M. Eugene de Zuccato, who has not only pointed out the way to be followed in carrying out the discovery, but has effectively completed the copying apparatus before publishing it to the world. Photography may be made to give its aid in producing the copy of the document or design in the first place, supposing the same cannot be produced direct; and from this reproduction is printed off as many facsimiles in an ordinary copying press as may be desired.

The invention consists in decomposing prussiate of potash by means of electricity, and causing it to form with iron the well-known pigment Prussian blue, by means of which the design is traced upon the paper. The apparatus is very simple and easy of explanation. A steel plate is covered in the first place with a coating of varnish, and upon this is scratched with a steel point any writing or design it is desired to copy; as the steel point has removed the varnish where it has touched the plate, the writing is of course formed of bright metal upon a varnished ground. If a design or autograph letter is to be copied upon the steel plate by photography, the metal surface is in this case coated with a solution of gelatine and bichromate, and then printed under a positive *cliché;* on washing, there will remain, in the same way as before, the writing or design in bright metal upon a ground of bichromated gelatine.

For printing, an ordinary letter-copying press is employed, the bed of which is insulated from the upper plate; so that if the two wires from an electric battery are connected, the one to the top and the other to the bottom of the machine, no current could pass until the upper and lower plates of the press were screwed together and thus brought into contact. Three or four sheets of thin copying paper are now impregnated with a solution of prussiate of potash, and while still moist the steel plate bearing the writing or design is placed upon them, and the whole put into the press. The wires of a battery are attached in the manner indicated, and the press screwed down. A current of electricity then passes from the upper to the lower plate of the press and through the moistened paper, decomposing the prussiate contained therein; the electricity can, however, pass only when there is a bright metal surface; and this occurs, as we have seen, only where the design in bright metal appears (where the steel plate is not covered with varnish); and in these places, some of the metallic iron being dissolved, there is formed prussiate of iron, or, in other words, the blue pigment known as Prussian blue. Consequently, the moist sheets of copying paper, when the electric action is set up, are stained with a reproduction of the design upon the metal plate; and as many times as the operation is repeated, so often will a batch of three or four copies be produced. As thirty seconds or a minute is sufficient for each operation, copies can in this way be easily obtained at the rate of a hundred per hour.

The patent is, we believe, the property of Messrs. Waterlow and Sons, who propose at once to offer it to the public; for in such places as the counting-house and engineer's office the apparatus will be invaluable. The electro-chemical copying press, as we believe it is termed, forms one more excellent example of science serving as handmaiden in our everyday life.—*Photographic Journal.*

QUICKSILVER.*

The long-prevailing high price of quicksilver has exercised an important influence on our mining interests, and the importance of obtaining it at low rates will be evident to all, except producers. In the production of gold and silver bullion quicksilver is an indispensable requisite, and without it our mines could not be developed, unless the ingenuity of our people could devise some suitable substitute not now known. The production of this necessary article at the cheapest possible rate is a matter of great interest to our mining population; and the many mines of this metal in California, by proper and economical working, with suitable appliances, and without combinations to keep up rates, should be able to produce and sell it at a much more reasonable price than present quotations. A low price for quicksilver would cause an increase in consumption, and of course, larger sales, requiring a greater production. It is an absolute necessity for the purposes for which it is mainly used, and for amalgamating particularly, where it is now used with a sparing hand, a more plentiful supply would be a material benefit.

The amount of quicksilver which the various mines of the world are capable of producing is very large, much larger, in fact, than is demanded for any purposes to which it is at present applied, and the only reason why it is held so high is that a few parties have control of the supply of the world. The Almaden Mine, in Spain, discovered in 1497, yielded for 250 years from 550,000 to 650,000 lb. per annum. In 1750, when the Huancavelica Mine of Peru caved in, and the supply from that source was temporarily cut off, the Almaden increased its production to about 2,016,000 lb. per annum, and has continued to yield that amount ever since. The Santa Barbara Mine, of Huancavelica, which had up to 1867 produced 80,000,000 dollars' worth of quicksilver, is now abandoned. The reasons given are its distance from sea-board, low grade of ores, and scarcity of fuel, being unable from these causes to make any profit in competition with the other great mines of the world. The Idria Mine, in Transylvania, is another of the important mines of the world, and its production is from 600 to 800 flasks per month. The ores are of a low grade. This mine is under lease from the Government.

California, among its numerous mineral advantages, possesses the broadest fields of this necessary article in the world, and by far the most prolific of its mines is the well-known New Almaden, in Santa Clara County. As it may be interesting to know the amount produced from this mine yearly, as the representative one of California, the following figures will show it, in flasks, premising that the flasks contain 76½ lb. of quicksilver. In 1851 the number of flasks produced was 23,875; in 1852, 19,921; in 1853, 18,035; in 1854, 26,325; in 1855, 31,860; in 1856, 28,183; in 1857, 26,002; from July, 1857, to October, 1858, 39,935. From that time to February, 1861, the mine was closed by injunction. From February, 1861, to January, 1862, it produced 34,765 flasks; in 1862, 40,391; in 1863, 19,564; in 1864, 46,216; in 1865, 47,194; in 1866, 35,150; in 1867, 24,461; in 1868, 25,628; in 1869, 16,898; in 1870, 14,000; and in 1871, 18,763 flasks. Total up to January, 1872, 537,176 flasks, each containing 76½ lb. of quicksilver.

The New Idria Mine, in Fresno County, produced in 1866, 6045 flasks; in 1867, 11,500; in 1868, 12,300; in 1869, 10,450; in 1870, 10,000; and in 1871, 9227 flasks. The Redington Mine, near Knoxville, Lake County, produced in 1866, 2980 flasks; in 1867, 7145; in 1868, 8700; in 1869, 5000; in 1870, 4546; in 1871, 2128 flasks.

Among the other mines whose products go to swell the gross amount are the Guadalupe, in Santa Clara County, owned in Baltimore, Md.; the Josephine, in San Luis Obispo County, owned by Barren and Co.; the Enriquita, owned by the Almaden, and the Bautista, owned by the Almaden, and now idle, both in Santa Clara County; the Pioneer is in Napa County, the Whitton is in Napa County, and there is one at Oakville. The Vallejo Mine is in Solano County; the Manhattan or Knox and Osborne Mine is three miles from Knoxville, in Lake County; the California is in Yolo, and there are several in Pope Valley, near Napa; the Abbot Mine is in Lake County; Excelsior in same county. There are several in Monterey, one of which is called the Pennsylvania, which produced a small quantity, and one owned by M'Garrahan not now being worked. There is one at Mount Diablo, Contra Costa County, which produced a small quantity, but is now in litigation. An occasional flask comes from the San Luis Obispo Mines. The Riotte and Lockhart Mine is at St. Helena, Napa County. The Phœnix, in Pope Valley, Napa County, produced in 1870, from a partial working only, 763 flasks. There is also a mine in San Bernardino County, and several recent discoveries in Napa and Lake Counties, and a

* This article, taken from an American source, appeared in the *Mining Journal* for June 15th, 1872. We reprint it as containing matter likely to be of interest to our readers.

number are spoken of, from which we hear little, in Coast Range, from up north down to San Bernardino County. The total product from all the California mines mentioned for the last three years was, according to the *Commercial Herald*, as follows:—In 1869, 36,600 flasks; in 1870, 29,546 flasks; in 1871, 31,881 flasks.

The total monthly product at present is said to be not over 3100 flasks, of which the New Almaden furnishes 1600, the Redington 600, the New Idria 600, and all others 300. The New Idria cleaned up 2000 flasks in January,—40 from the mine, and the remainder from what had accumulated inside the condensers.

Quicksilver has remained at a high rate for the past three years, and at such a one as the amount of production and demand does not warrant. A combination, or ring, control the whole supply, and keep the prices where they can make the most profit, Through the agency of Mr. Butterworth, the manager of the Almaden, a contract for the delivery of 50,000 flasks from the products of the mine prior to April 1, 1868, was made in 1866 with the late Mr. W. E. Barron for 30 dollars per flask. They obligated themselves not to sell or consign any quicksilver from the mine until the contract entered into was completed. Messrs. D. O. Mills and W. C. Ralston were Mr. Barron's securities for the faithful performance of his part of the contract, which was to advance 150,000 dollars on the debt of 250,000 of the company, and if necessary advance money to meet the full amount. The contracting parties found in April, 1868, that the production exceeded the demand, or rather that while the production was increasing the demand was the same, and declined to contract to purchase any more. However, another contract or agreement was made between Butterworth, representing the New Almaden, Barron and Mills, controlling the New Idria, and the owners of the Redington Mine for two years. By the terms of this contract as far as known, these mines were to limit their production to a certain amount, Barron and Co. were to be shipping and foreign agents, Redington and Co. local agents for the sale of the quicksilver here. The product of the mines was reduced, and by the arrangements made, the combination netted a profit of about 35 dollars per flask on the sales. The annual report of the New Almaden Company for 1870 states that the financial matters of the mine were in a bad state, and 55,000 dollars was required immediately to settle a lawsuit. There was also a large amount due to the bank of California. The agent, Mr. Butterworth, to get out of this financial difficulty, entered into contract with D. O. Mills to sell him the 15,525 flasks of quicksilver hitherto delivered to Barron and Co. under combination contract and all that would be delivered up to April, 1870, under said contract at 32 dollars in gold per flask. And all the product for two years from April, 1870, at 31 dollars gold per flask, half cash on delivery and half cash in 60 days, he discounting all deferred payments at current rates of interest if the company should so require. The company had the right to deliver an average of 2000 flasks of quicksilver monthly. He was to pay the company any sum that might arise after deducting amount due to Barron and Co. for advances on the quicksilver under their contract.

When the combination contract between the New Almaden, New Idria and the Redington Mines expired, the owners of the Redington, knowing that the two other mines were controlled by the same parties, declined to enter into any new combination or sell their product for the price which the New Almaden did. They finally entered into contract with Barron and Mills to sell their product for ten years. The price was not made public, but was generally understood to be forty dollars per flask, and the production was to be limited to a certain amount; Redington and Co., under this agreement, were still to have the local sale.

The Almaden Mine, in Spain, is entirely in the control of the Rothschilds, who have a lease of it. This mine supplies the London market and a large part of Europe and Mexico. California supplies the United States, China, and India, so the world is divided between the two great producers. An understanding exists between the two controlling parties which permits each to dispose of their quicksilver in their respective markets. The result is that a pound of quicksilver, owing to the duty of 15 per cent., is 15 per cent. dearer in California, where it is produced, than in Mexico, to which place it is exported from Spain.

By referring to the figures given above, it will be seen that the product of the several mines has gradually decreased since these combinations were formed. The consumption is, of course, limited, and an over supply would not suit the measures of the men who have control. Moreover, what is consumed would be consumed if it were 1 dollar or 1 dollar 50 cents per lb., just the same as at 85 cents; but small miners could not use it to advantage. The amount lost in amalgamating has been discussed at length in the *Scientific Press*. The Almaden ores just as they come from the mine would not average over 3 per cent. metal, and the Napa Mines not more than 1 per cent., so a good deal of ore is rejected; 3 per cent. ore, however, will pay well, and all of the mines would pay if they choose to sell at lower rates. Some of the mine owners, however, sell their product to the Bank of California combination, while others with small lots traffic with hardware dealers or others who supply parties in the interior. They generally undersell the combination a few cents, but the amounts are so small they make little difference. Although it is understood that the contract of this combination expired on the 1st of April of this year, their profit has been so immense that it is probable that there will be a renewal, and a combination of the various mines and interests will most probably be effected. So far as known at the present time, no such steps has yet been taken; but as prices remain as they have for months past, it is to be supposed that we shall have no reduction for some time to come. The owners of the Redington purposely keep down their product, because they prefer to keep the ore in the mine rather than sell it at the price agreed under a contract which only compels them to deliver what they manufacture. The only chance we should have to get a decrease in price would be in case a number of the new mines should refuse to enter the combination, and increase their product; but there is little chance of this. The ring have, too, a good thing of it, and doubtless intend to continue their operations on the old basis. Perhaps we ought, under the circumstances, to congratulate ourselves on being able to get it even at the advanced price we do. Still it seems lamentable that an article which is so indispensable to our mining operations should be subject to a speculative combination, without any conscience, as it depresses the leading industry of the coast. The miner requiring the use of quicksilver in California is obliged to pay the monopoly price, 85 cents per lb., while a merchant exporting pays but 80 to the same company for the same material.—*Scientific Press* (San Francisco).

EARLY CLOSING IN THE PROVINCES.

A Meeting of the Chemists of Loughborough was held on the 21st inst., and was the first of a series. The primary object was to take into consideration the desirability of a curtailment of the hours of business. All the members of the trade resident in the town were present, and they unanimously agreed to close their several places of business at eight o'clock in the evening (Saturdays excepted), when the hour was fixed at eleven o'clock.

Various trade matters were discussed, and general unanimity prevailed that the formation of an association would be advantageous; the lateness of the hour, however, prevented a definite decision, and the question was postponed to a future meeting, to be holden on the first Monday in August.

The Pharmaceutical Journal.

SATURDAY, JUNE 29, 1872.

Communications for this Journal, and books for review, etc., should be addressed to the EDITOR, 17, *Bloomsbury Square.*

Instructions from Members and Associates respecting the transmission of the Journal should be sent to ELIAS BREMRIDGE, *Secretary,* 17, *Bloomsbury Square, W.C.*

Advertisements to Messrs. CHURCHILL, *New Burlington Street, London, W. Envelopes indorsed "Pharm. Journ."*

THE POSITION OF WIDOWS UNDER CLAUSE 16 OF THE PHARMACY ACT.

WE had thought, after the numerous explanations which have been given, in this Journal and otherwise, of the effect of Clause 16 of the Pharmacy Act, that at least its meaning was understood, and although there might be a disposition in some quarters to seek for an alteration of the law, for the sake of the relatives of those who might die without making the necessary arrangements for carrying on a business, we believed the possibility of such a provision and the nature of it were now pretty well known to the whole body of chemists and druggists. But the letter of Mr. BARKER, which is printed in another part of the Journal, and is only a type of many that we have received, appears to show that there is still considerable misapprehension upon the subject; and as it is a matter of very great interest to the majority of the members of the trade, we have thought it preferable to risk saying what has been said before if by so doing errors may be dissipated before they are irremediable.

The precise words of the portion of Clause 16 about which so much interest has centred, since the attention of the members of the Pharmaceutical Society present at the Annual Meeting was called to it by Mr. SMITH, are as follows:—"Upon the decease "of any Pharmaceutical Chemist or Chemist and "Druggist actually in business at the time of his "death, it shall be lawful for any executor, adminis- "trator or trustee of the estate of such Pharmaceu- "tical Chemist or Chemist and Druggist to continue "such business if and so long only as such business "shall be *bonâ fide* conducted by a duly qualified "assistant; and a duly qualified assistant, within "the meaning of this clause, shall be a Pharma- "ceutical Chemist or a Chemist and Druggist re- "gistered by the Registrar under the Pharmacy "Act or this Act."

In our opinion, upon the death of the proprietor of a chemist and druggist's business, the plan most judicious and profitable for all concerned is to realize the property on the most favourable terms that can be obtained, rather than carry on the business by a kind of proxy, with the possibility of its dwindling away. But those who differ from us in this opinion will see that the above words, read intelligently, provide for cases where it is wished to carry on a business, and certainly they are not open to the charge of inflecting hardship upon the survivors. If any hardship arises, it will be through the misapprehension or the neglect to act upon the provision therein made.

One principal danger seems to lie in the possible neglect of the fact that the power of an executor, administrator or trustee to carry on a business with the assistance of a duly qualified assistant exists only as long as the trust lasts, and that as soon as the trust ceases, such persons have no more right to carry on the business than any other unregistered person. As was clearly explained by the SOLICITOR at the last Annual Meeting, a business can "only "be carried on by trustees, or executors, or adminis- "trators, *not by a legatee.* If a man died without "a will, some one must administer in the estate, and "he could carry on the business for the benefit of "the widow; but the moment the estate passed to a "legatee, then the executorship or trusteeship came "to an end." With regard to the possible duration of a trust, he also explained that there was no limit "if and so long only, as such business shall be *bonâ "fide* conducted by a duly qualified assistant." Now, as it is possible to appoint any person a trustee on behalf of any other person, it is evident that any hardship that may arise will not *primâ facie* be caused by this clause.

Another point that must not be forgotten is the fact that the word "assistant" has a meaning attached to it in this instance very different to that with which it is unfortunately too often associated. As has been before pointed out, there is nothing in the law which prescribes the qualifications that must be possessed by an "assistant" to a registered chemist and druggist; this is at present left to his own judgment. But the "assistant" employed by an executor, administrator or trustee of an estate, must be a "pharmaceutical chemist" or a registered "chemist and druggist."

We have not alluded to this subject with any desire to promote the multiplication of such trusts as those above referred to. On the contrary, as we have before remarked, we believe that, as a rule, it is better that a business should be disposed of, while the associations of its former proprietor are fresh in the memory of the customers, than that they should be deadened by the intervention of one who cannot possibly take the same interest in it. But there is evidently a great deal of uneasiness, and perhaps some ill feeling existing among chemists and druggists, arising from a misunderstanding of the actual state of the law, and therefore any explanation that tends to remove it will have a worthy object in the promotion of peace and good will among the members of our body.

THE WATER FAMINE IN BERMONDSEY.

The dispute which has now for some time been raging, as to whether the water supplied to the metropolis is open to the charge of containing unoxidized recent sewage contamination, or whether the Government officials have been slandering good water and indulging in unnecessary indignation against the companies supplying it, has at least in one district been in abeyance during the recent hot weather; for in Bermondsey the people have been left almost without any supply at all, either good, bad or indifferent. Grimly satirical upon our boasted civilization is it that side by side with the newspaper accounts of the opening of a new museum for the special educational benefit of the "working man" in the east of London, we may read how his representative in the south of London has had to bring home the water for tea in a bottle from the factory where he works, or how he and his wife have had to wash for three days in the same water. And with such scarcity of supply for necessary wants of course such luxuries as baths and washhouses or the flushing of sewers are not to be thought of.

The want of interest that, spite of the new watchword, has been evidenced in the House of Commons about the progress of the Public Health Bills, may perhaps be partly attributed to a feeling that the creation of machinery for securing purity of water without a guarantee of the supply is, after all, putting the cart before the horse. Such a state of things would hardly be tolerated in an effete Eastern town; but the probability is that there the people would not be handed over to that modern invention for defying public opinion and sinking the individual conscience—a public company.

VIRES ACQUIRIT EUNDO.

From Clifton we hear that the members of the trade, with one exception, have joined in a notice to the public that on and after the 1st of July their shops will be closed for general business at 7 P.M. At Kilburn, the pharmacists have determined to act with those of St. John's Wood. And from Shepton Mallet we have received a circular, sent out by Mr. G. J. Cottrill, saying that as he does not keep an assistant he proposes to close at five o'clock on Wednesday afternoons.

Dr. Odling, F.R.S., the Fullerian Professor of Chemistry at the Royal Institution, has been elected Waynflete Professor of Chemistry in the University of Oxford, in the room of Sir Benjamin F. Brodie, F.R.S., resigned. Dr. Odling has also been elected a Fellow of Worcester College.

We learn from the 'British Medical Journal' that the Pharmaceutical Society of Lisbon has determined to hold an exhibition of Portuguese medicinal products, and that a committee has been appointed to arrange the time, place and other details.

Transactions of the Pharmaceutical Society.

EXAMINATIONS IN LONDON.

June 19th and 26th, 1872.

Thirteen candidates presented themselves for the Major Examination; of these, *five* failed. The following *eight* passed, and were declared duly qualified to be gistered as,—

PHARMACEUTICAL CHEMISTS.

*Townley, Thomas William	Ambleside.
*Jasper, Frederick William	Penzance.
*Shenstone, William Ashwell	Colchester.
Rammell, Edward	Crediton.
Warren, William	Chertsey.
Jameson, William Edward	Bristol.
Bouttell, Harold	Sudbury.
Bradford, Cordley	Spalding.

Forty-two candidates presented themselves for the Minor Examination; of these, *sixteen* failed. The following *twenty-six* passed, and were declared qualified to be registered as

CHEMISTS AND DRUGGISTS.

	*Watson, William	Chatham.
	*Perry, George Edward	Dudley.
	*Goldsmith, John Jackson	Abingdon.
	Cleaver, Edward Lawrance	London.
	Wheeler, Albert	Southsea.
	Dunston, Alfred	Spalding.
	Plummer, Arthur	Reading.
	Baynham, William Bevan	Bath.
	Sturton, Richard	Cambridge.
Equal.	Edwards, Charles	London.
Equal.	Jones, Owen Williams	Flint.
	Sherburn, Frederick	Keighley.
	Johnstone, William	Nottingham.
	Sangster, William	Islington.
	Jones, David	Rhyl.
	Colling, Robert	Stockton-on-Tees.
	Newton, Thornton Albert Claughton	Devonport.
	Brookes, Frederick James	Selby.
Equal.	Bell, Thomas	Harrogate.
Equal.	Cardell, Richard Taylor	Bodmin.
Equal.	Leake, Thomas Whaplate	London.
Equal.	Taylor, Henry Francis	Exeter.
	Thirlby, William Arthur	Ashby-de-la-Zouch.
	Atkinson, Miles Christopher	Manchester.
	Lewis, Edward	Sandown.
	France, Joseph	Rotherham.

The above names are arranged in order of merit.

PRELIMINARY EXAMINATION.

The undermentioned were received in lieu of this Examination:—

Certificates of the University of Cambridge.

Bayston, George	Guildford.
Izod, James	Sittingbourne.

Certificate of the University of Oxford.

Daves, William	Torquay.

Certificate of the University of Durham.

Barkas, Charles Edward	Newcastle-on-Tyne.

Certificates of the College of Preceptors.

Pearson, Thomas Styan	York.
Robinson, James Hedley	North Shields.

* Passed with Honours.

Provincial Transactions.

MIDLAND COUNTIES CHEMISTS' ASSOCIATION.

The Third Annual Meeting of the Midland Counties Chemists' Association was held in their Rooms, 24, Quadrant Chambers, New Street, Birmingham, on Friday evening, May 31st, at 8 o'clock. Mr. Dymond, President, in the chair. The attendance of members was good.

The minutes of previous meeting having been read and confirmed, the following report was read by Mr. Lucas, Honorary Secretary.

Report.

"The Council of this Association is gratified in being able to issue a report this year of much encouragement.

"In their circular of July 10th, 1871, an endeavour to awaken a fresh interest in the objects of the Association was announced, to which a response of a most hopeful kind was made. The number of members, which, a year ago, was 102, is now (members and associates) 188, a large proportion of whom have been actively interested in the proceedings of the Association. The rooms in the Quadrant Chambers have been made good use of, the records showing that about 1600 visits have been made to the reading-room, exclusive of a large number of visitors who have omitted entering their names in the visitors' book. Of these, the associates (principally those who are engaged as assistants in business) form by far the larger part. It is this large and important class of chemists who must ultimately be the real gainers by the objects of the Association.

"The first meeting of the associates took place in October, at the invitation of the President, who supplied coffee and refreshments. The meeting was crowded, and it was certainly the largest assemblage of assistants ever held in Birmingham. Its principal object was to consider an educational scheme for the winter months. The scheme as proposed was adopted, and the names of about forty students who were desirous of attending classes and lectures were given in on the spot. The attendance at the classes did not ultimately keep up to the original number at the commencement of the session, reasons being found in the facts that some of the students left their situations and removed to a distance, and others having during the session passed through their troubles at Bloomsbury Square, felt the immediate pressure of the need of study removed. The lectures and classes were held in connection with the Birmingham and Midland Institute, the educational facilities of which are likely to prove of great advantage to the Association. To those students who joined the lectures in chemistry, the Professor of Chemistry, Mr. J. C. Woodward, gave special occasional lectures in the Pharmacopœia. The attendance at lectures on botany has been limited to ten persons. The Latin classes have assisted many to pass the Preliminary examination.

"During the year four evening meetings have been held, which have been well attended.

"At these meetings papers have been read as follows:—'The Examinations of the Pharmaceutical Society,' by William Southall; 'Volumetric Analysis,' by Henry W. Jones; 'The Study of Botany,' by J. B. Williams; and 'Disinfectants,' by Wentworth L. Scott, F.C.S.

"Amongst the other incidents of the past year may be noted a petition to Parliament, in June, praying for the suspension of any further legislative interference in the keeping and sale of poisons by chemists. It will be remembered that the Bill then before Parliament was afterwards withdrawn, and has not since been introduced.

"In the same month a grant of £10 was received from the Council of the Pharmaceutical Society, for the purchase of additional books for library. The secretaries were instructed at the same time to make application to the Free Libraries Committee of the Borough of Birmingham, for a restoration of the books committed to it in 1863, by the Birmingham Pharmaceutical Association, then expiring. This application was refused. In connection with the library, the council records its grateful thanks for many valuable presents thereto, amongst the rest, for some excellent pictures from Mr. Thomas Hyde Hills, for a clock from Mr. Edward Snape, and for a cabinet of materia medica specimens from Messrs. Evans, Sons and Co.

"The early closing of chemists' shops has obtained considerable attention; and an endeavour made during the year to secure an uniform hour for closing throughout the town of Birmingham, was not successful. The need of different districts of the town vary so considerably that it has appeared hopeless to expect all should combine in the observance of the same hour, but an agreed time, to suit the convenience of different districts has met with some success. This subject is likely to obtain further attention.

"The 'Price Book' of the Association has had a continued demand, the sale during the year being 149 copies, exclusive of copies supplied to members of the Association gratis. The Council cannot too earnestly commend to chemists the desirability, as far as practicable, of observing uniformity in the price of drugs, and particularly of medicines dispensed from prescriptions, and also of marking with the private mark of the Association all prescriptions when first compounded, that the first compounder of a prescription should invariably mark on it the price he has charged, with the private mark of the Association.

"On January 12th, 1872, a meeting of members of the trade was held in the rooms, to discuss the proposals made in this district by the Metropolitan Co-operative Association for the supply of drugs by chemists to its members. An unanimous feeling of opposition to this proposal was exhibited, and the signatures of a large number of chemists obtained, pledged to decline it. It was afterwards found that only one or two chemists in Birmingham remained under any engagement to the Co-operative Association, and its schemes, as far as chemists are concerned, practically fell through.

"The Council of this Association has also had the important subject of Provincial Pharmaceutical Education under its consideration, believing that great centres like Birmingham, have not yet obtained their due share of aid from the Central Council in London. A recent minute of the London Council, and an important movement of opinion among chemists throughout the country, gives the hope that this subject will, ere long, receive the attention it demands.

"The Council has sought to obtain for the Great Midland District, of which Birmingham is the centre, a representative at the Council Board in London; but, unfortunately, without success. It was hoped that the just claims of this district to a representative, and the personal character of Mr. John Churchill, would have secured his election. The Council suggest that it may be necessary to reform the present method of election, by which the representation of the chemists of the country is so unequally divided.

"Amongst the records of the year must not be omitted that of the *soirée*, which was given by the President on February 6th, 1872. Such a gathering of gentlemen and ladies interested in pharmacy had certainly never met in Birmingham before. It was attended by 240 persons. A great variety of scientific experiments and objects of interest were shown. Music was provided. The refreshment room was duly honoured with guests; and at half past ten, the floor being cleared, dancing commenced, and was continued till a late hour, every person agreeing that the evening had been most successful and enjoyable, and that it must be made an annual affair.

"The financial statement for the year is appended to this report, and shows a satisfactory balance in hand. This result, however, would not have been obtained without liberal donations, which it cannot be expected should be continued, and the Council conclude to ask the annual meeting to sanction a slightly increased annual subscription to meet the growing needs of the Association. As it is also not thought desirable that the cost of the winter *soirée* should in future devolve on the President, the subscription proposed is as follows:—For members, 7*s.* 6*d.* (or to admit to the *soirée*, 10*s.*); for associates, 3*s.* 6*d.* (or to admit to *soirée*, 5*s.*) each.

"In looking forward to the future of this Association, the Council is full of hope that the progress which has marked the past will continue, and that it will prove of real benefit to its members and others.

"Much yet remains to be done in the qualification of some of its members as members of the Pharmaceutical Society, and the Council invite chemists who have not yet done so to qualify themselves.

"The fee is a moderate one, and though the immediate results to the individual may not be perceptible, yet their general position in the advancement of pharmacy will have been thereby stengthened, and the coming generation will benefit by the advance (though it be small), which they have themselves made.

"It is believed that there is yet a considerable number of persons in the Midland District who vend poisons, who are not in the register of chemists and druggists. The Council wish to assist any legitimate chemists whose names may have been inadvertently omitted from the register, to obtain registration; but, at the same time, to protect the trade, by aiding in the prosecution of any others, who are neither entitled by the authorization of law, nor by their calling in business, to vend poisons; and they invite information of all such cases wherever they may be found in the Midland Counties.

"Donations of books for the library are earnestly desired.

"The attention of members and associates, and their friends, is again drawn to conveniences which the rooms of the Association provide.

"As a place of resort for trade meetings, the deposit of letters and parcels, letter writing for travellers, price lists, etc.; and as a house of call they are capable of much greater use besides affording opportunities for study to young men. The woman in attendance is prepared to receive miscellaneous work from chemists, such as pill making, powder folding, senna picking, and the thousand and one odd jobs of the shop, which she can perform at her place in the rooms, at a reasonable tariff of her own.

"STATEMENT OF ACCOUNTS.

From May, 1871, *to May*, 1872.

DR.	£	*s.*	*d.*
Balance in hand	19	15	2
Subscriptions from Members and Associates	42	15	0
Sale of Price Books	7	9	5
Donations	22	18	6
Sale of *Soirée* Tickets	0	12	6
	£93	10	7

CR.	£	*s.*	*d.*
By Furnishing	17	14	9
,, Books and Periodicals	18	18	10
,, Printing and Stationery	17	16	3
,, Advertising	1	8	1
,, Postage	2	18	10½
,, Rent of Rooms	15	0	0
,, Taxes	3	3	9
,, Coal and Gas	1	10	2
,, Attendance	1	4	6
,, Sundries	2	8	1
,, Balance with Treasurer	10	13	2
,, ,, ,, Hon. Sec.	0	14	1½
	£93	10	7"

The adoption of this Report was moved by Mr. Churchill, seconded by Mr. Brassington, and carried.

The re-election of the President, Mr. G. Dymond, was moved by Mr. Arblaster, seconded by Mr. Churchill.

The re-election of the Treasurer, Mr. E. Snape, was moved by Mr. Churchill, seconded by Mr. Grieves.

The election of Messrs. W. R. Jones and F. G. Homer as Honorary Secretaries was moved by Mr. Brassington, seconded by Mr. Churchill, jun.

The election of Messrs. A. Southall and W. S. Akins as auditors was moved by Mr. Dymond, seconded by Mr. J. B. Williams.

The election of the following gentlemen to form th- Committee for the ensuing year was moved by Mr. Dye mond, seconded by Mr. Whittle, viz., Messrs. J. Churchill, H. Whittle, S. H. Morris, C. F. Palmer, T. Barclay, S. Dewson, G. Owen, J. Luca, W. Price, T. W. Holdsworth, Frobisher, Brassington, N. Mason, A. S. Grieves, H. Howes, and C. J. Arblaster.

The vote of thanks to retiring officers was moved by Mr. Brassington, seconded by Mr. Churchill All the resolutions were carried unanimously.

TYNESIDE CHEMISTS' ASSISTANTS' ASSOCIATION.

At the rooms of this association, Royal Arcade, Newcastle, on Thursday evening, the 20th inst., Mr. R. D. Spence read a very interesting and instructive essay on "Some of the Crystals of the Pharmacopœia." There was a good muster of members, and Mr. B. S. Proctor, who was present, took an active part in the discussion which followed the essay; at the close of which both Mr. Spence and Mr. Proctor were awarded votes of thanks.

The Secretary, Mr. G. H. Proctor, called the attention of the members to a special subscription which was being raised to fit up a laboratory in connection with the association. Several gentlemen promised donations, amongst whom was Mr. Shaw, who also announced that he had received the promise of £1. 1*s.* 0*d.* from Mr. W. Herring, London.

Proceedings of Scientific Societies.

PARIS SOCIÉTÉ DE PHARMACIE.

At the sitting of this Society on Wednesday, May 1st, under the presidency of M. Stanislas Martin, M. Lefort read a paper on "Belladonna," which he had studied with regard to the distribution of atropine in different parts of the plant,* and also as to the advantages that might result from the substitution of the leaves for the root in processes having for their object the extraction of that alkaloid. Describing in detail the mode of treatment which he applied to the leaves, M. Lefort insisted that the proportion of spirit really required is much less than that employed in the ordinary processes.

M. Boudet urged the importance that these researches presented at a time when alcohol is subjected to a heavy duty. Thus the process described by M. Lefort might have for a consequence the lessening of the cost of production of the alkaloids, and so bring back to the French laboratories the manufacture of those products, of which the origin is entirely French, but which are at present obtained in considerable quantities from other countries.

M. Duquesnel mentioned some considerations that led him to think that the employment of belladonna leaves in the fresh state for the extraction of atropine offered some advantages.

M. Lefort replied that he did not notice these advantages in his experiments, and that the employment of the fresh leaves would have the inconvenience of

* See *ante*, p. 1029.

limiting the time of manufacture to a small portion of the year. He added that he thought it of great importance that the École Supérieure de Pharmacie should exercise a careful supervision over the preparation of the alkaloids or active principles of plants, such as atropine, aconitine and digitaline, which under the form of granules or otherwise are met with so frequently in pharmacy, and which have the inconvenience of not possessing the desired uniformity, together with inexactness of dose, such granules and dragées not being generally prepared in pharmaceutical laboratories.

M. Mayet thought that it would be useful to call the attention of pharmacists and medical men to the danger that might result from the employment under the same name of very different substances, such as the digitaline of M. Nativelle compared with that of M. Homolle, and the aconitine of M. Duquesnel compared with that of M. Hottot.

M. Grassi showed the importance of this point by giving the details of a recent case of poisoning caused by the successive use in the making up of a prescription of amorphous aconitine and crystallized aconitine.

M. Roucher said that, besides the digitalines of M. Nativelle and M. Homolle, which differed from each other in many respects, there was the German digitaline, which, unlike both the others, did not sublime partially under the influence of heat.

M. Bussy considered that although these new products extracted from aconite and digitalis recommended themselves to the pharmaceutist by the characters of chemical purity and uniformity that they possessed, at present their medical action is not sufficiently determined to justify their substitution for the substances hitherto used in therapeutics. Until medical experience was more definite upon this point, the pharmacien should only use the substances prepared according to the Codex in the dispensing of prescriptions.

M. Poggiale thought that this question was of great interest; and even if it could only be decided by medical experience, the Society of Pharmacy could at least furnish the materials for this investigation by establishing the nature of the substances that should serve as a base, and by making a comparative study of their physical and chemical properties. While admitting that the Academy of Medicine had, according to law, the sole right to propose new formulæ, he did not think their society should, therefore, renounce the study of such questions as were of chemical and pharmaceutical interest. He proposed that a commission should be appointed to investigate the subject.

This proposition was agreed to; and the members nominated were MM. Bussy, Boudet, Grassi, Duquesnel, Lefort and Roucher.

M. Bussy gave a *résumé* of the sittings of the Academy of Sciences, and mentioned that M. Personne had recognized the presence of selenium in the sulphuric acid of commerce.

M. Duquesnel communicated the results of his observations upon sulphate of eserin (physostigmatin). Having noticed that a solution of this salt acquired a red colour in a short time, and apparently spontaneously, he sought if this alteration led to a weakening of the active properties of the medicament. The colouring matter, isolated by treatment succesively with potash and chloroform, had but little or no effect; from whence he infers that, if it represents, as he is led to believe it does, a product of oxidation of the eserin, the sulphate of that alkaloid will become less and less active as the solution becomes more and more coloured.

M. Desnoix presented to the society a duck's egg in which he had found two yolks, and which enclosed beside another egg, itself containing two yolks.

CHEMICAL SOCIETY.

Prof. Cannizzaro's Faraday Lecture.*

This lecture was delivered on May 30th, by Prof. Cannizzaro. The lectureship was founded by the Chemical Society in honour of the illustrious Faraday, to be held by some eminent foreign *savant*, who, during the term of his tenure, is to deliver a discourse before the Society. Dr. Frankland, in introducing the lecturer, said that in 1869 M. Dumas had honoured them with his presence there, and on that night they were to listen to Prof. Cannizzaro, of Palermo. After alluding to the numerous investigations which the Professor had made in organic chemistry, and amongst others the discovery of benzylic alcohol, the first normal aromatic alcohol that had ever been prepared, and to the important theoretical views which he had originated, the President, in the name of the Society, presented to him the Faraday Medal, struck in honour of his visit.

Prof. Cannizzaro said that when he received the flattering invitation to deliver the Faraday Lecture, he was placed in very unfavourable circumstances to respond to it, as he had no definite results to lay before the Society, and was, moreover, on the point of suspending his labours and abandoning his old laboratory in order to remove to Rome and establish a new one there. In this difficulty a subject for a discourse fortunately presented itself,—one which the celebrated French chemist Dumas had promised to treat of in 1847, namely, the form which the theory of chemistry should take at the present time. Although this could not be fully discussed in so short a space of time, it would at least have the advantage of directing the attention of chemists to a question of great importance in the transition stage which our science is at present going through.

In recalling the promise which M. Dumas had made to the Academy of Sciences of Paris in 1847, to examine the form which theoretical instruction in chemistry should take in the present state of the science, the lecturer proposed to consider in his discourse the limits within which the exposition of general theories should be included in teaching chemistry, and the form that it was desirable that they should assume. Whilst giving a broad sketch of the progress of modern chemistry, he showed that the atomic theory had become more and more intimately interlaced with the fabric of chemistry, so that it is no longer possible to separate them without rending the tissue, as it were, of the science; and that up to the present time we have been unable to enunciate even the empirical laws of chemical proportion independently of that theory; for those who employ the term equivalent in the sense that Wollaston did commit an anachronism. Consequently, in the exposition of the value and use of symbols, formulæ and chemical equations, not only are we unable to do without the atomic and molecular theory, but it is inconvenient to follow the long and fatiguing path of induction which leads up to it. By one of those bold flights of the human mind we can at once reach the height whence we discern at a glance the relations between facts.

He then went on to show that the solid basis, the corner-stone of the modern molecular and atomic theory, the crown of the edifice of which Dalton laid the foundation, is the theory of Avogadro and Ampère, König and Clausius, on the constitution of perfect gases, to which chemists, unknown to themselves, have been led in the progress of their science. He thought the time had arrived for reversing the order which had hitherto been followed in teaching chemistry, that instead of setting out from the criteria for determining the weight of molecules, and then showing their ratio to the vapour densities, they ought, on the contrary, to commence with the latter, with the theory of Avogadro and Clausius, demonstrating it from physical considerations; to found upon that the proof of the divisibility of simple bodies,—that is to say

* Reprinted from 'Nature,' June 20, 1872.

the existence of atoms; and to show, as occasion presented itself, that the weights of the molecules and the number of the atoms deduced by the application of this theory are in accordance with those which are deduced from chemical criteria. By this means we can measure the degree of confidence to be placed in the latter criteria; since so-called compound equivalents do not suffice to determine the weight of molecules, or even to prove their existence, although they may be deduced from a single principle, the theory of the constitution of gases. This is the natural transition from physics to chemistry.

The Professor then stated in detail how he applied the principles he had laid before them. He introduced his pupils to the study of chemistry by endeavouring to place them on the same level as the contemporaries of Lavoisier, and to teach them to appreciate the importance of the principle of the conservation of the weight of matter, showing them that this is quite independent of any idea of its nature or constitution. They are thus led to examine the ponderable composition of substances, so that the student passes rapidly from the epoch of Lavoisier to that of Proust, and then to that of Berzelius at the time when he commenced his researches on proportions. At this stage the same impulse is given to the pupil as Berzelius received on becoming acquainted with the hypothesis of Dalton. The latter is laid before him without any accessory, the use of symbols and formulæ being introduced dogmatically. There will now arise in his mind the same doubts and difficulties that assailed Berthollet, Sir Humphry Davy and Wollaston in the application of Dalton's theory, and at the same time a desire for an explanation of the simple relation which exists between the vapour volumes of bodies which react on one another, and of the products which are obtained. Now is the moment to state or recall to mind the physical theory of the constitution of the perfect gases. Commencing with a rapid glance at their general and special characters, he insisted that in this part of the instruction the mind of the student should not be diverted from the numbers expressing their relations by considerations of the variations caused by changes of temperature and pressure. In applying the theory of the constitution of gases, it will be perceived that the molecules of simple bodies are not always the atoms of Dalton, and a certain confusion will thus be produced in the mind of the beginner in the conception of the ideas of atoms and molecules. The hypothesis of Dalton can now be laid aside, substituting as a starting-point the theory of the relation of molecular weights to the vapour densities. A table must be prepared of the vapour density compared with that of hydrogen as 2; that is to say, the weights of their molecules compared with the weight of the semi-molecule of hydrogen taken as unity. We must then compare the composition of the molecules containing the same element (including or not the molecule of the element itself), and thence deduce the law of the existence of atoms,—that is to say, the amount of each element which always enters, by whole multiples, into the molecules which contain them. We here have the atoms of Dalton, which, in the present state of the science, express not only all that Dalton discovered, but also the composition of equal volumes of their vapours, and in the choice of which those doubts can no longer arise which embarrassed Davy and Wollaston. The ideas of molecules and atoms suggested to the student by this law are devoid of all considerations of form, size, continuity or discontinuity; the only property indissolubly connected with them is that of ponderability, the very definition of matter.

Recollecting that no physical theory of the constitution of matter had yet been advanced which thoroughly conformed to chemical ideas, he insisted upon the advisability in teaching the molecular and atomic theory, to keep it free from all that is not absolutely essential, so that it may preserve sufficient plasticity to adapt itself to the progress of our physical and mathematical knowledge. For this purpose he thought it useful to allow the student in the first place to glance at the changes in the hypothesis of the constitution of matter, and then to cause him to estimate the degree of confidence they merit in the actual state of our knowledge. Having thus placed upon a solid basis the fundamental notions of atoms and molecules by the comparison of the composition of equal volumes of the bodies in the gaseous state, it becomes necessary to consider the difficulties which arise in the application of these notions when the vapour densities are wanting; he explained and justified the use of the various auxiliary criteria to which we have resource in these cases, proving them in the first instance by the touchstone of the theory of Avogadro and Clausius, by showing that they gave results in accordance with that theory whenever the two methods can be employed simultaneously.

He believed that we should never lose sight of the starting point, nor give the formulæ of all compounds as of equal probability. "It is not by concealing the obscurity of these questions that we shall enlighten the student; on the contrary, we should estimate each fact at its true value by showing him that our science does not merit an equal degree of confidence on all points." This forms the introduction, the preparation for the study of the transformations which matter undergoes; the real object and aim of our science.

The comparison of the atomic composition of molecules has led chemists to the law of substitution, to the theory of types of Dumas, then to that of Williamson and Gerhardt, and lastly to the theory of the different valency of atoms and their modes of union, or the so-called theory of atomicity which includes the former. Although at present it is impossible, in teaching chemistry, entirely to eliminate this latter theory, which gives a summary of several laws, and guides us ordinarily in the co-ordination and even prevision of a large number of facts, yet it is difficult to keep it within just bounds so as to avoid infusing into the mind of the beginner illusions which are dangerous for his intellectual education. In order to avoid this, it is advisable to bear in mind the progress of this doctrine and the actual phase of development which it has at present reached. It is still far from being a complete and well-established theory, but is in a state of transition; for although doubtless it embraces a large number of facts, as yet it does not embrace them all. It is only a partial representation of the reality, and that from a restricted point of view, showing but little relation to our views of the constitution of matter, for it is the result of a comparison of diverse facts expressed by means of the atomic and molecular theory. It is convenient, therefore, to consider each part of this doctrine exclusively in relation to the group of facts which has suggested it.

It is unadvisable to define the valency of atoms as a property inherent in them, and then to deduce as a corollary their different modes of union; on the contrary, it is preferable to regard each portion of this doctrine as a deduction from the observation and comparison of a determinate group of facts, until an opportunity offers to unite these fragments into one whole, not forgetting, however, to notice the gaps which exists, never going beyond what the facts themselves suggest, and never applying to all bodies indiscriminately, the laws which suit only a single group. For instance, we must not pass over in silence the facts that whilst certain elements are bi- tetra- or even hexa-valent, others are tri- and penta-valent; but the pupil should be prevented from acquiring mechanical and geometrical ideas of the cause and effects of the valency of atoms, by frequently reminding him that chemical facts show nothing about the size, form, continuity, or relative position of atoms. If we are sometimes obliged to employ the expression, "relative position of atoms in the molecules," and even to represent them graphically, we must warn the student that these are only artifices to express certain transformations, and that we are really ignorant of the relative position of the atoms either in space or in the mutual action of different portions of matter. With these reservations, it is possible, in teaching to derive considerable advantage from the theory of atomicity, and at the same time to avoid its inconveniences.

In the study of the transformations which matter undergoes, we should direct the pupil's attention, not only to the ponderable changes in the composition of molecules, but also to the electrical and calorific phenomena which accompany these transformations. Even from Lavoisier's time it has been recognized that we cannot separate the study of matter from thermic considerations; and every day the connection which exists between chemical and thermic phenomena becomes more apparent.

As in the study of ponderable changes we were guided by the law of the conservation of weight, so in the connection between chemical and dynamical phenomena we are guided by the law of the conservation of force; the two studies mutually supplementing and illustrating one another. Not only will the atomic and molecular theory and that of atomicity help us to compare dynamical phenomena, but the study of dynamical phenomena will show us analogies and differences between chemical actions which would not be observed in the ponderable equations. We should therefore instruct the student in the little definite knowledge which we at present possess concerning thermic and electric phenomena, and especially fix in his mind the fundamental notion of a mechanical equivalent, and the manner of comparing it with chemical action as expressed by the atomic theory. In this we should be aided by the previous or simultaneous instruction of the student in physics under the form and language of the thermodynamic theory.

The lecturer concluded by observing that in the choice of methods and of matter for a course of chemistry, it should always be borne in mind that it was eminently a progressive science, and that even at the time of its most rapid development. The student should start not only with a knowledge of certain definite and fixed principles, but with an apitude and sufficient preparation to enable him to follow the science in its unceasing transformation and progress, whether he intends expressly to cultivate chemistry, or has only learnt the elements of the science as an auxiliary to other studies or professions. Moreover, the end of chemical instruction for both these classes of students is not only to fix in their memory a certain amount of knowledge, but to assist in their intellectual education. For this, chemistry of all sciences is one of the best, offering both in verbal and practical instruction—excellent occasions for the exercise and harmonious development of all the faculties of the human mind.

He had desired to call attention to what he considered to be the most efficient means of imparting a knowledge of chemistry so that it might serve as an instrument of intellectual education, and that the student, by following it in its ulterior developments, might judiciously apply it to the study of the other branches of natural science. If the attention of the eminent chemists and professors there present were once attracted to this subject, he felt certain that a bright light would be thrown on it, and that our young professors would find numerous suggestions to direct them in teaching chemistry, and that at the very moment when instruction in our science had become so difficult on account of the rapid transformation which it was undergoing.

Dr. Williamson said, that those who were there present ought not to separate without some expression of the pleasure that they had felt on listening to so learned, vast, and eloquent a discourse, treating as it did of a most difficult and important problem. There was scarcely anything of greater moment in the scientific education of youth than the rightly setting before them those wonderful transformations of matter which it is the province of chemistry to explain. These great and growing truths, for, as the lecturer had said, they were growing truths, should be set before youth in such a manner as to form a coherent whole. He hoped to study this masterly discourse with profit and delight, and would now propose a vote of thanks to his illustrious colleague for the honour which he had done them in delivering to them the Faraday lecture.

Professor Tyndall said he had heard the discourse with deep interest, for it showed that the lecturer knew the importance of a teacher's vocation, and that his province was not merely to communicate knowledge, but to do it in such a manner as to arouse an interest in and love of the subject in the pupil by presenting it in its proper relations. He would have welcomed the lecturer to that Institution, even had he come to tear in pieces the notions which he cherished regarding atoms and molecules; how pleasant it was then to find such a broad agreement between their views. The chemist cannot halt at equivalent proportions—he must ask himself whence they arise, and the inevitable answer is some form of the atomic theory. This theory, however, cannot be confined to chemical phenomena. The motions of those atoms and molecules underlie all our explanations of the physical cause of light and heat, and it is already taking up the field of magnetism and electricity. Consider, for example, the heat of gases, both as regards the motion of translation of the molecules which produce temperature, and the motions of rotation and vibration of their constituent atoms, which, though they do not express themselves as temperature, constitute a portion of the heat. Clausius has shown that even in the simplest gases nearly two-fifths of the whole heat is due to these internal motions; while in gases of complex molecular constitution which condense on combining, the ratio of the total heat to the heat of temperature is still greater. The experiments of Regnault, which show that the specific heat of a perfect gas at a constant volume is constant, proves, as Clausius has shown, that the one kind of motion is proportional to the others.

The lecturer had also referred to atoms of the same kind combining together, so that, free oxygen and free hydrogen being considered as composed of molecules, each containing a pair of atoms, has certainly simplified the results. But it must not be forgotten that this combination of like atoms is widely different from that of unlike atoms. The union of oxygen with oxygen or nitrogen with nitrogen produces no such effects upon the luminiferous ether as the union of oxygen with nitrogen. With the same quantity of matter the amount of *vis viva* sent forth as radiant heat may be augmented a thousandfold, perhaps a millionfold, by the act of diverse combination. This act seems to carry with it a condensation of the ether to a dense atmosphere around the atoms. Had a cannon the power of gathering round itself a dense atmosphere, it would send forth a greater amount of *vis viva* as sound. A gun fired at Chamouni may be heard upon Mont Blanc, while the same gun fired on Mont Blanc may not be heard at Chamouni, because the air on which the concussion takes place is denser in the one case than in the other. In the same way the diverse atoms vibrating in the denser atmosphere formed on combination show their vast superiority as radiators over like atoms which, except in such special cases as ozone, etc., are incompetent to produce a similar condensation. The speaker then asked them to echo the resolution so well put to the meeting by Prof. Williamson.

Thursday, 20th June, 1872; Dr. Frankland, F.R.S., President, in the chair.

After the usual business of the society had been transacted, the President announced that Mr. Hyde Hills had given ten guineas to the fund for promoting original research, and promised to further increase his donation by ten guineas for each ninety subscribed for the same purpose.

Mr. H. Deacon then delivered his lecture "On Deacon's method of obtaining chlorine, as illustrating some principles of Chemical Dynamics." The process consists in passing a heated mixture of air and hydrochloric acid over sulphate of copper or over pieces of pumice or brick saturated with the same. He finds that the action is essentially a surface action, and that there is a certain comparatively small range of temperature between the critical limits of which the percentage of hydrochloric acid decomposed varies greatly. The velocity with which the mixed gases pass over the surface of the active material also causes considerable variation in the comparative amount of chlorine produced.

After a vote of thanks to the lecturer, the meeting adjourned over the recess.

Parliamentary and Law Proceedings.

PAPERS PRESENTED TO PARLIAMENT.

Second Annual Report of the Deputy-Master of the Mint.

The Report of Mr C. W. Fremantle, Deputy-Master of the Mint, concerning the operations in that establishment during the year 1871 has just been issued. The amount of gold coinage executed was far above the yearly average, which is about 5,000,000. But so extraordinary was the demand for gold coin which characterized last year that £9,798,735 was struck during that time, of which no less than £5,748,200 in sovereigns and £140,000 in half-sovereigns were coined and delivered between the 25th of September and the 20th of December.

The coins struck during the year were of four metals,—gold, silver, bronze and nickel, the last being pence and halfpence for use in Jamaica. The total number of pieces was 30,022,404, and their value, real or nominal, £10,580,061 11*s.* 5*d.* Of British coins there were sovereigns and half-sovereigns in gold, florins, shillings, sixpences and threepences in silver; and pence and halfpence in bronze. Besides these there were fourpences, twopences and pence in silver, sufficient for "Maunday money only." It will not be out of place here to remark that the issue of crowns and half-crowns has been suspended since 1851, and that of groats or fourpenny-pieces since 1856.

With reference to the first two of these coins a point is under consideration that marks the progress that has been made during late years in metallurgy. As is well-known, silver when extracted from its ores usually contains a small quantity of gold; but the process of refining as practised when the coins in question were struck was too expensive to admit of the extraction at a profit of the small quantity contained in them. At the present day, however, improvements in refining render it possible to extract with profit any quantity of gold exceeding two grains in the pound troy of silver. Samples examined in the Mint prove that the half-crowns now in process of withdrawal contain an average of 4·07 grains in the pound, and when therefore any considerable quantity of these coins has accumulated in the Mint, it will probably be advisable to recommend that the gold should be extracted from them before they are re-coined. So long ago as 1831 this subject was alluded to before a Parliamentary Committee by Mr. Mathison, the officer then in charge of the refinery at the Mint, and an opinion was expressed by him that the extraction of gold from the worn silver coin melted during the year would have been attended with an actual profit of £1412 to the public.

The work in the melting-house is frequently prolonged by the steps which must, in many cases, be taken for recovering, before the daily account can be balanced, the portions of metal which may have remained in the crucibles, or have been unavoidably spilt during the crack of the bars. [In the uncertainty which at present prevails as to the removal of the Mint to a new site, it has not been considered advisable to take steps for replacing the melting furnaces now in use by those in which gas would be used as fuel; but sketches have been made by the chemist of the Mint of gas furnaces actually in use elsewhere, and the consideration of the question will be resumed whenever the opportunity may arise.

In a memorandum by Mr. Hill, the Superintendent of the Operative Department, he states that the benefits derived from the introduction of plumbago crucibles for silver melting have been most marked, and he adds that they are not only better and cleaner, but also considerably cheaper than the iron pots formerly in use, and that the out-turn of each day's work is far more satisfactory. The old crucibles are ground up in the same manner as those that have been used for gold-melting, and the "sweep" is washed so as to obtain as much silver from it as possible, and is afterwards dried and sold.

With regard to this "sweep," it may be stated that hitherto it has been the practice to grind the crucibles, ashes, etc., and to sell by tender such portions as pass through a sieve of forty meshes to the inch. With a view to ascertain whether it was desirable to continue the above-mentioned practice, or to undertake as an operation of the Mint the extraction of the precious metals from the "sweep," Mr. Roberts, the chemist of the Mint, made a series of assays, but arrived at the conclusion that comparatively small quantity resulting from a coinage of average amount could not be treated with profit to the department.

The actual deficiency of metal at the close of the gold coinage in June last was found to be 402,728 ounces, the value of which in money was £1568 2*s.* 5*d.*, or £241 per million. The greater part of this deficient metal having been recovered by the sale of the "sweep" for £1240 13*s.* 4*d.*, the actual loss of the Mint on the coinage was proved to be £327 9*s.* 1*d.*, or £50 per million. In this waste on the coinage of gold is included the loss attending the reception of light gold for re-coinage. This loss is due to two causes: (1) that a certain amount of dirt always adheres to the surface of the coins, the weight of which disappears in melting, and (2) that although received as standard gold, the light coins at present in circulation are found to be in reality below the exact standard of fineness, and to require the admixture of a certain proportion of fine gold before they can be again converted into coin.

The method which has been recently introduced of toughening brittle gold by means of a current of chlorine gas is reported upon very favourably. Brittleness in gold is usually due to the presence of minute traces of foreign metals, and these metallic impurities are eliminated as chlorides by the passage of chlorine gas through the molten metal. The amount of gold set aside as unfit for working during the coinage of £6,500,000, which was completed in July, 1871, amounted to 40,000 ounces. In the melting of gold, as ordinarily practised in the Mint, crucibles of graphite are employed, but such crucibles are not well adapted for use in the treatment of gold by chlorine gas, as the gases evolved from them exercise a reducing action upon the chlorides. It therefore has been fouud advisable to substitute crucibles of fire-clay for those of graphite.

About 1100 ounces of gold are melted in each crucible, and the chlorine gas is pasaed through each in succession, the time during which the metal is exposed to the gas varying from five to seven minutes. The gold is found to be perfectly tough, and is re-assayed and again melted with the amount of copper required to form standard gold.

The following statement indicates the result of the operations upon 40,000·000 ounces of standard gold.

	oz.	oz.
Amount of initial loss		40·360
Amount of gold recovered from ground-up crucibles, borax, etc.	15·507	
Amount of copper and base metal proved by assay to have been eliminated as chloride	27·746	40·253
	Loss	·107

It will be seen that the loss on toughening 40,000 ounces was only one-tenth of an ounce, and the process may now be considered to have fairly taken its place as an operation of minting.

The accuracy of the automatic weighing machines, in which each piece of gold and silver is weighed before it is issued, has, during the large coinages of the year, been severely tested, and, owing to the rapid execution of the work in the rolling and adjusting rooms, and the increased liability to error consequent upon it, additional care has been necessary in the weighing-room to prevent the issue of coins not within the remedy of weight prescribed by law. It is necessary in weighing coins to use a still smaller remedy than that which the law allows; and it may serve to give some idea of the delicate nature of the work performed by these machines if it be stated that the 100th part of a grain is sufficient to cause a sensible deflection of the beam, and that the weight which denotes whether a sovereign is or is not within the remedy is represented by a piece of wire of fine gold, 0·1355 of an inch in length, and 0·018 of an inch in diameter, and weighing 0·17 of a grain.

On the completion of the last gold coinage, which amounted to £6,500,000, it was found that the aggregate weight of the pieces corresponded precisely with the standard weight prescribed by law. Such exactitude it is believed, has never been attained before on so large a coinage; but it should be remarked that so close an agreement with the standard weight depended upon conditions which cannot always be secured.

During the year 1871, the staff has been increased by the appointment of "balance mechanician," to undertake the repairs and adjustant of scales and weights; work hitherto performed by private firms.

The abolition of the office of non-resident assayers, and the return to the ancient system under which all bars when allowed and melted in readiness for coinage, and coins selected from all the coined work, were assayed within the mint itself, is reported to have been attended with most satisfactory results, it having rendered possible the exercise of a more direct and efficient control than heretofore over many details upon which the accuracy of coining in a great measure depended, and materially contributed to a more rapid execution of the coinage. But in order to provide for a portion of the duties formerly performed by the non-resident assayers, namely that of determining questions that might arise between the Master of the Mint and importers of bullion for coinage as to the correctness of assay reports, a Consulting Assayer to the Mint has been appointed in the person of Dr. John Percy, F.R.S. In the new assay office the volumetrical method of assaying silver has been introduced, and it has been found that the method is peculiarly well adapted for the verification of the composition of silver alloys which vary little in fineness.

The most important which have taken place during the year 1871 in the coinages of European countries, has been the introduction of a new coinage of gold into the currency of Germany, as a preliminary step to the option of gold as the single standard of value. It is satisfactory to note the steps taken by the German Government, namely, the introduction of a gold standard, and the establishment of a uniform coinage based on the decimal system, throughout the Empire; but it is to be regretted that a coinage has been adopted which in one important particular at least is open to serious objection, and may give rise to some difficulty. In the discussions which have taken place during late years, it has been shown that there are several gold coins in Europe and the United States of America, either already issued, or proposed to be issued, which contain a nearly identical quantity of pure gold, namely,—

Half-eagle or 5-dollar piece (United States)	7·52 grms.
Sovereign (England)	7·32 „
25-Franc piece (proposed for France, and the States associated with her in the Monetary Convention of 1865.)	7·26 „

In addition to these the Spanish Government has proposed to coin a piece of 25 pesetas, of equal value with the 25-franc piece. To these coins, however, recent legislation in Germany has added the 20-mark piece, containing 7·16 grms. of pure gold, and equal in English money to not more than nineteen shillings and sevenpence, the issue of which creates a further divergence from that uniformity which is so much to be desired, and forms an additional obstacle to the adoption of an international gold coin.

In the die department amongst the new designs must be noticed the sovereign bearing the reverse of St. George and the Dragon, which, having been authorized by Order in Council, has been issued concurrently with those of the design already in use during the present reign. The Mint has also been called upon to furnish a medal to be awarded annually to the best shot in the infantry of the army, which will shortly be issued.

In concluding the report, allusion is made to the proposed change of site for the Mint. It is stated that the works of the Mint are in no way of a nature to create a nuisance to a neighbourhood, no refinery being now attached to the department. Only refined metals are melted, in the fusion of which no acid is employed, and any fear that the processes carried on might be injurious to health are said to be without foundation.

Poisoning by Water Hemlock.

On Monday afternoon the coroner, Mr. Tatlock, held an inquest at the Turf Tavern, Chester, on the bodies of two boys, inmates of the Workhouse, named George Dobson and Albert Kinsey, who met their deaths on Sunday by eating what they supposed to be wild celery, but which was in reality water hemlock. From the evidence it appeared that the schoolmaster took the boys out for a walk on the Roodee after morning service, and, having proceeded with them as far as the railway arches which span the river Dee, told them they might amuse themselves till they were called, and then returned to the Workhouse. The boy Dobson, who had been in the same place on the previous Tuesday eating the roots of the plant, and who had suffered most severely in consequence, persuaded the other boy to go down to the edge of the river to gather some of the "wild celery," which they did, and having filled their pockets returned to the yard of the Workhouse, where they freely indulged. The roots, according to the evidence of Dr. Britain, have the taste of soft cocoanuts, are quite palatable, but are most dire in their effects. Shortly after eating them the boys became extremely ill. The doctor was sent for, and he at once administered an emetic of mustard and hot water, which took effect on all except the two deceased boys, to whom it was impossible to administer any in consequence of their suffering from severe convulsions, and their teeth being tightly clenched. He, however, applied turpentine externally, but without avail, and the boys died most agonizing deaths. The jury returned a verdict of died from the effects of eating water hemlock.—*Liverpool Daily Post.*

Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

The Pharmacy Act and the Sale of Homœopathic Medicines.

Sir,—Permit me to avail myself of your columns to inquire of those of my brethren skilful in interpreting the Pharmacy Act "whether *homœopathic* chemists may legally keep open shop for the dispensing of physicians' prescriptions and the sale of poisons without being on the register of the Pharmaceutical Society?" and, if not, why have they been treated with such considerate tenderness by the officials of the Society?

I am myself under the impression that the Act applies to homœopathic quite as fully as to allopathic chemists; indeed, if such be not the case, any person desirous of entering the sacred precincts of pharmacy without passing through the legitimate but tedious path of the examinations, may easily do so, and entirely evade the Act by placing the adjective 'homœopathic' before his assumed title of chemist, and exhibiting in his shop some pilules, globules, a few bottles of arnica, strong solution of camphor, etc. But having reported to the Society, a considerable time ago, what appeared to me to be a most flagrant case without their taking any decisive action therein, I presume the possibility of my opinion being erroneous, and think it desirable to bring the subject before the notice of the trade, as it undoubtedly affects all pharmacists in no small degree, and should, I think, be no longer overlooked by the Society's executive.

The popular notion of the trade of a homœopathic chemist is that it is confined to supplying drugs (poisonous or otherwise) in doses so infinitesimal as to possess no more therapeutic activity than Sac. Lactis or Sp. Vini Rect. That this is an erroneous notion, fifteen years' experience of homœopathy enables me to prove. In the first place, it is by no means an uncommon occurrence to retail the mother tinctures of aconite, belladonna, nux vomica, etc., prepared in the proportions of 1 to 10, as directed by the British Homœopathic Pharmacopœia, or the first or second decimal of arsenicum, morphia, antim. tart. and other potent medicines; and, secondly, it is a portion of almost every day's work to dispense prescriptions for liniments or applications containing chloroform, aconite, and belladonna liniments, or tinct. opium, etc., in sufficient quantity to poison very many people.

The following are copies of prescriptions written by a homœopathic physician in large practice, and who invariably directs his patients to have their medicine prepared by a certain homœopathic chemist, who has passed no examination, is not on the register, and who, therefore, in vending poisons and preparing prescriptions, is surely violating the very letter of the Pharmacy Act; yet it is against such an offender that the Society declines to take proceedings.

℞. Trit. Podolph. Resin 1* gr. xij.
Divide in pulv. vj cujus j bis in hebdomadâ sum.

℞. Liq. Arsenic. Fowler. ʒ ij.
Aq. Dest. ad ℥ iv.
Misc. Cap. ʒ j ter die.

Divide Trit. Morph. Hydroch. 2 x gr. 100 in pulv. æq. x. Cap. j ex aquâ coch. amp. omni nocte et repet. post horas quatuer si opus sit.

℞. Lin. Belladon. P. B., ℥ iij.
Chloroform, ℥ j.
M. ft. lin. more dict. utend.

℞. Kali. Brom. gr. 80.
Aq. Dest. ad ℥ iv.
M. Cap. ℥ ss. ex aqua bis die.

Is it not decidedly unfair that those of us who have given both time and money to procure the requisite qualifications for business, should find ourselves opposed by persons possessing no legal title whatever, whilst a great and wealthy Society, supposed to keep a sharp eye on such offenders, stands coldly aloof and declines to protect the interest of its members?

A Chemist.

Position of Widows under Clause 16 of the Pharmacy Act.

Sir,—Without wishing to make special reference to the particular case to which Mr. Smith alludes, may I ask you to give information to prevent the repetition of so sad a calamity.

If a chemist makes his will and leaves his wife executrix, jointly with a (male) friend, can he (if not a chemist) carry on the business, with a qualified assistant for her benefit and that of her family?

As I, with many others, have been toiling on for many years, I should deeply regret if, through any act of inadvertence on our part, our wives or children were deprived of the fruits of our industry and application.

Joseph Barker.

Kingston-on-Thames, June 15th, 1872.

Chemical and Pharmaceutical Curiosities of a Medical Practitioner.

Sir,—Would you kindly give the following a place in your Journal, for the amusement of all interested. Some time ago the following prescription was brought to me to make up:—

℞. Col. 2 . . . ʒ ij.
Ol. Olive . . ℥ ij. M.
Sig. Use as directed.—G. G.

Not knowing any chemical compound under such a symbol, I at once communicated with the writer, but got no answer; during the forenoon of the following day, the following was brought in its stead by the same customer:—

℞. Acid Carbol. . . ʒ ij.
Ol. Olive . . ℥ ij. M.
Sig. Use as directed.—G. G.

The other day I again received the following rather obscure prescription:—

℞. Saponis cum pici. . ℥ ij.
Sig. For external use.—G. G.

There being no official preparation of this kind in the P.B. or any other Pharmacopœia that I knew, I at once wrote to him for information about it, but whether he is ashamed of his ignorance, or what, I know not, but he has not yet replied, and the prescription remains with me undispensed.

G. H.

June 18th, 1872.

W. Dixon.—We will endeavour to obtain the information asked for by you.

G. Broom.—A communication that we have received through the publishers bearing the above signature, appears to be a *résumé* of what has recently appeared in the medical papers on the subject. The subject, however, is too purely a medical one, to be suited for our columns.

"*A Registered Student of the Society.*"—Your question shall be answered next week.

G. C. Cottrill.—We beg to acknowledge your communication, and think your resolution a very wise one.

"*Pharmacien,*" "*An Apprentice of the Pharmaceutical Society,*" and *E. W. B.*, are all referred to the rule as to anonymous communications.

"*Nemo.*"—(1 and 2.) Yes. (3.) We think such sales in wholesale quantities, and under the regulations prescribed by clause 17 of the Pharmacy Act and the Arsenic Act, would not be construed as being an infringement of the Act.

"*One who has known the Drug more than Thirty Years.*"—Thanks for your cutting. It does not look healthy, and we regret to see it.

The following journals have been received:—The 'British Medical Journal,' June 22; the 'Medical Times and Gazette, June 22; the 'Lancet,' June 22; the 'Medical Press and Circular, June 22; 'Nature,' June 22; the 'Chemical News,' June 22; 'English Mechanic,' June 22; 'Gardeners' Chronicle,' June 22; the 'Grocer,' June 22; the 'Journal of the Society of Arts,' June 22; 'Grocery News,' June 22; 'American Chemist' for May; 'Practitioner' for June; the 'Madras Monthly Journal of Medical Science' for May; 'New York Druggists' Circular' for June; 'American Journal of Pharmacy' for June; the 'Western Lancet' for April; the 'Pharmacist' for May; the 'Devonport Independent,' June 22.

Communications, Letters, etc., have been received from Mr. J. Paget, Messrs. Thorne Bros., Mr. Nuthall, A. P. S. 'Mel.'

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All Letters to the Editor will be found arranged under the head of "Correspondence;" Leading Articles, etc., under the head of "Editorial Articles and Notes."

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Pharmaceutical Society of Great Britain.

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